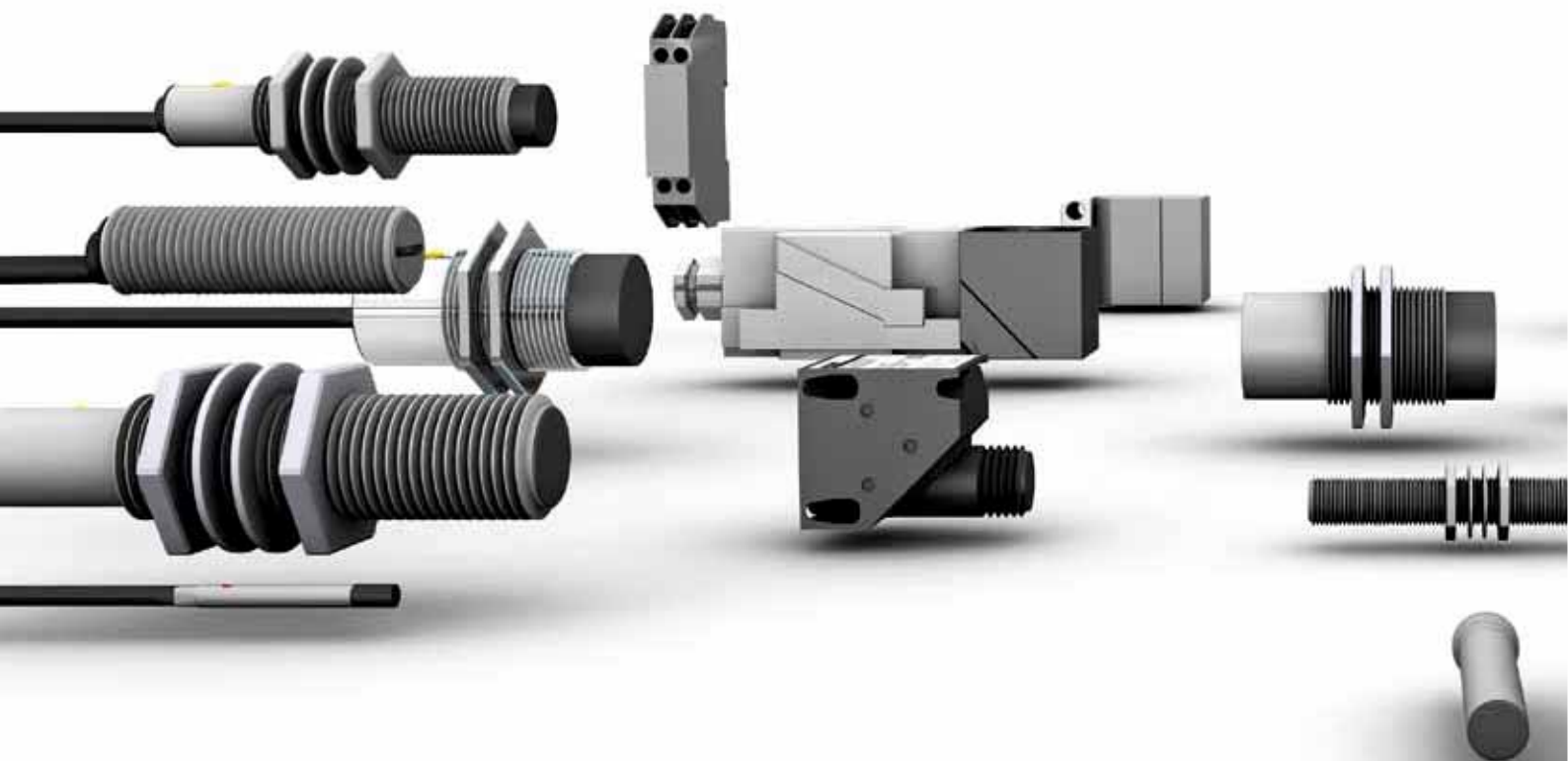


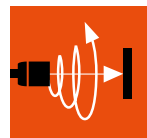
Inductive Sensors

Inductive sensors for object detection

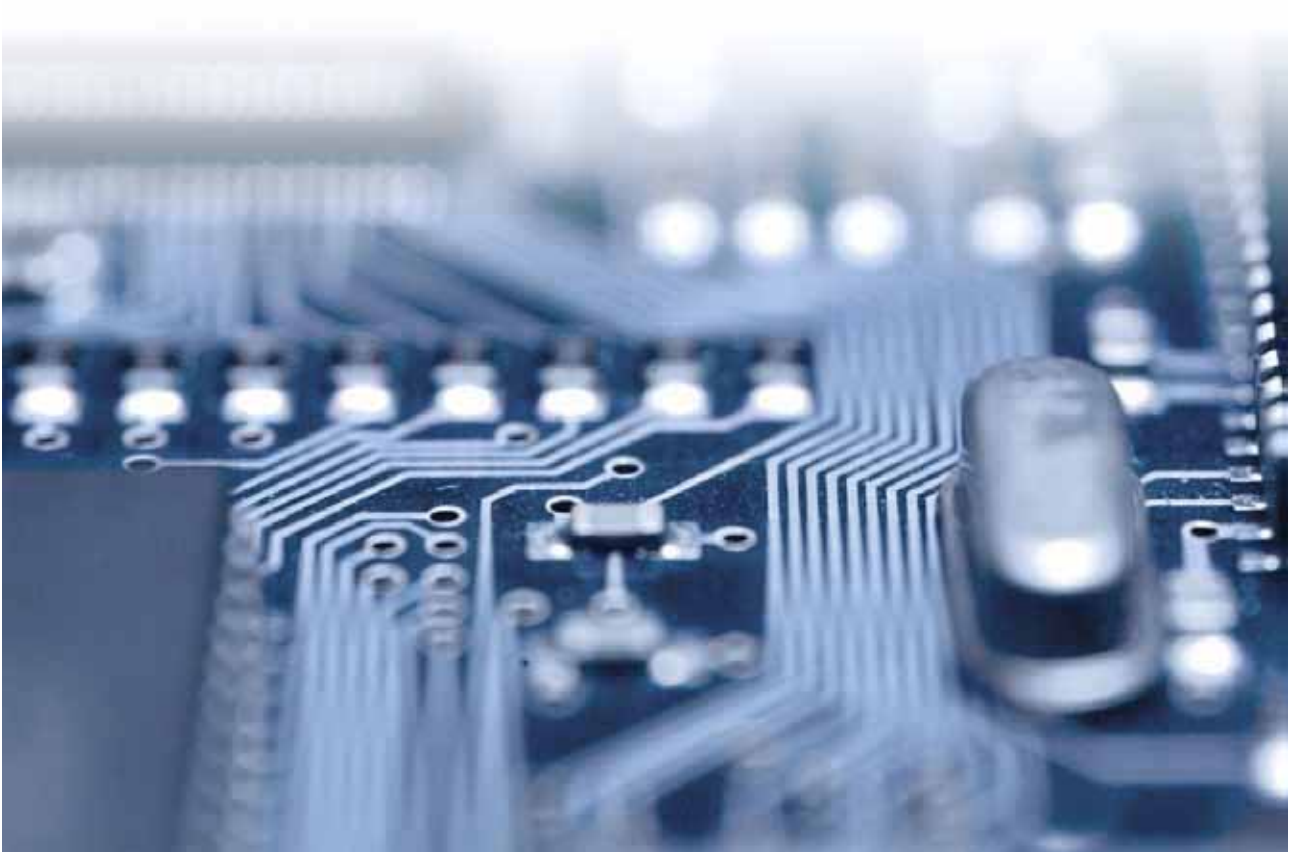
Automation is almost inconceivable without inductive sensors. Wherever processes are automated, non-contact position detection, freedom from wear, and reliability are in demand. Whether in machine building, automation technology, electronics manufacturing or the plastics industry, in textile machines, wood processing or in the automobile industry – Balluff sensors monitor, control and automate processes and states. Providing the highest quality and optimized for any application. From standard to extended switching distance, from temperature and high-pressure resistant to "Factor 1" from mini to maxi: You, too, can take advantage of Balluff's versatility for your applications. And profit from the reliability and quality of proven products from your full-line provider.



Inductive Sensors		Inductive Sensors with Special Properties	
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Product overview	448	Ex sensors	634
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		Sensors for the food industry	652
DC 3-/4-wire Inductive Sensors		Factor 1 sensors	662
Cylinder designs	472	Weld and magnetic field immune sensors	674
Block designs	530	Diagnostic sensors	682
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		Protective coverings for unicomact sensors	725
		Protective end caps	726
		Positive stop	728
		Tube switch	730
		Contact protectors	732



Basic information and definitions can be found on **page 934**.



DC
3-/4-Wire


F1

DC
2-Wire

PTFE
Coated
Weld
Immune

AC/
DC
2-Wire

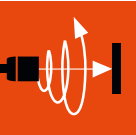
500bar
High
Pressure



120°C
High
Temperature

IP68
BWN Pr27
BWN Pr20

Stainless
Steel



Inductive
Sensors
**Performance
Spectrum**
Product
Overview

Global
DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

AC 2-wire

Special
Properties

Analog
Distance
measurement

Accessories



Housing size	Ø 3 mm, Ø 4 mm, M4×0.5	M5×0.5	Ø 6.5 mm, M8×1, Ø 8 mm	M12×1	M16×1	M18×1
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Inductive Sensors							
Global DC 3-wire			Page 455	Page 461		Page 464	
DC 3-/4-wire	Page 473	Page 478	Page 482	Page 508		Page 516	
DC 2-wire			Page 571	Page 574		Page 576	
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Inductive Sensors with Special Properties							
High-pressure resistant sensors		Page 619 Page 624 Page 625	Page 625	Page 619 Page 620 Page 626	Page 621	Page 622 Page 632	
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Large designs							
Ring sensors							
Hose sensors							

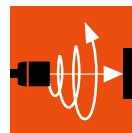
Inductive Sensors for Analog Distance Measurement							
Cylinder designs			Page 698	Page 699		Page 703	
Block designs							
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Inductive Sensors
Performance Spectrum
Product Overview
Global DC 3-wire
DC 3-/4-wire
DC 2-wire
AC/DC 2-wire
AC 2-wire
Special Properties
Analog Distance measurement
Accessories

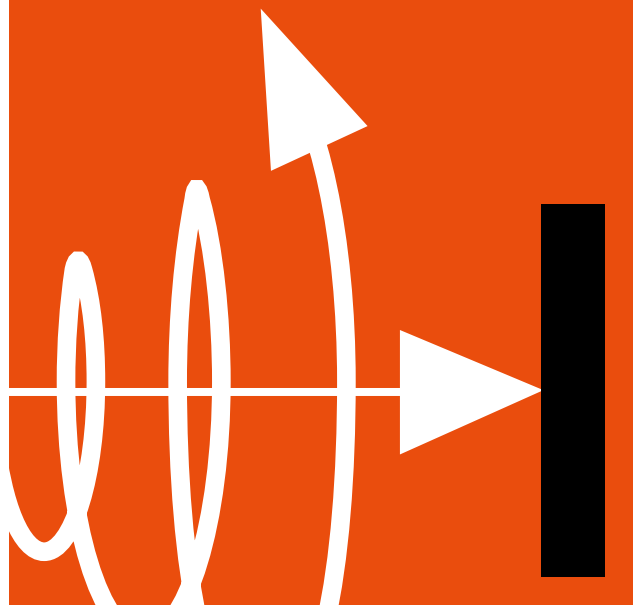


Housing size	25x50 mm	26x26 mm	26x40 mm	42x48 mm	74x60.5 mm	40x40 mm Unicompact	
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Inductive Sensors							
Global DC 3-wire							
DC 3-/4-wire	Page 546		Page 548	Page 550	Page 551	Page 553	
DC 2-wire		Page 583				Page 584	
AC/DC 2-wire			Page 599			Page 601	
AC 2-wire							

Inductive Sensors with Special Properties							
High-pressure resistant sensors							
Ex sensors						Page 639	
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Temperature-resistant sensors	Page 647						
Full PTFE sensor							
Sensors for the food industry							
Factor 1 sensors						Page 671	
Weld and magnetic field immune sensors						Page 681	
Diagnostics sensors						Page 683	
Large designs							
Ring sensors							
Hose sensors							

Inductive Sensors for Analog Distance Measurement							
Cylinder designs							
Block designs							
Ring sensors							



Inductive Sensors

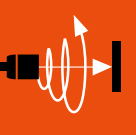
DC 3-wire inductive Global sensors

DC 3-wire inductive Global sensors: The complete series of standard sensors. Global sensors are the most economical sensors from the Balluff group. These standardized sensors are available at all times and fulfill most tasks excellently.



Cylinder Designs

Ø 6.5 mm	455
M8x1	456
M12x1	461
M18x1	464
M30x1.5	467



Global



Basic information and definitions can be found on **page 934**.



Global: The complete series of standard sensors

The inductive standard sensors are usually available ex warehouse, can be used globally, are globally standardized and have an optimum price-performance ratio.

- Short and mid-size designs Ø 6.5 mm to M30x1.5
- Shielded and unshielded designs
- Cable and connector versions
- Standard and extended switching distance



Model		
Installation type (observe instructions in the Basic Information chapter)		
Rated switching distance s_n		
Assured switching distance s_a		
Switching distance marking		
PNP, NO	Ordering code	
	Part number	
PNP, normally closed	Ordering code	
	Part number	
NPN, NO	Ordering code	
	Part number	
NPN, NC	Ordering code	
	Part number	
Supply voltage U_S		
Voltage drop U_d at I_o max.		
Rated insulation voltage U_i (protection class)		
Rated operating current I_o		
Polarity reversal protected/transposition protected/short-circuit protected		
Ambient temperature T_a		
Switching frequency f max.		
Output function indicator		
Degree of protection as per IEC 60529		
Approvals		
Material	Housing	
	Sensing surface	
Connection		

Wiring diagrams, see page 958.

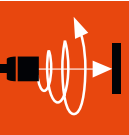
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request.

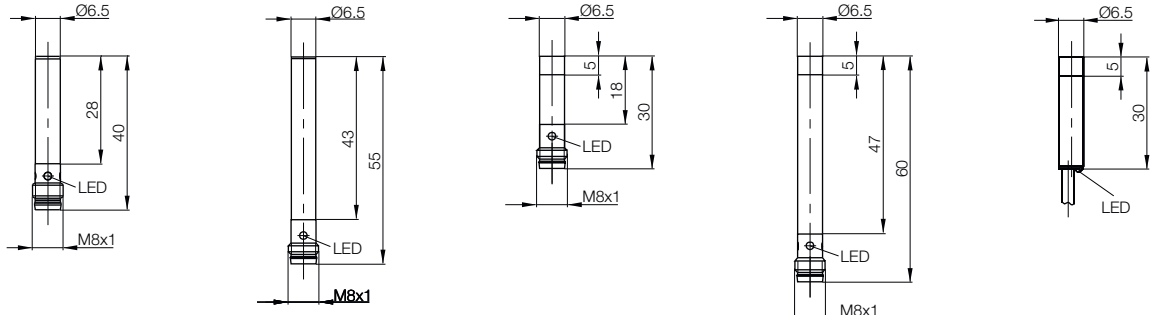
Global



Ø 6.5 mm	Ø 6.5 mm	Ø 6.5 mm	Ø 6.5 mm	Ø 6.5 mm
Flush	Flush	Not flush	Not flush	Not flush
2 mm	2 mm	4 mm	4 mm	4 mm
0...1.6 mm	0...1.6 mm	0...3.2 mm	0...3.2 mm	0...3.2 mm
■ ■	■ ■	■ ■	■ ■	■ ■
BES03R9	BES03P4	BES0005	BES03P5	BES000F
BES G06EE-PSC20B-S49G-003	BES G06EH-PSC20B-S49G	BES G06EB-PSC40F-S49G	BES G06EH-PSC40F-S49G	BES G06ED-PSC40F-BV02
BES03RY	BES03RT	BES0004	BES03T1	BES000C
BES G06EE-POC20B-S49G-003	BES G06EH-POC20B-S49G	BES G06EB-POC40F-S49G	BES G06EH-POC40F-S49G	BES G06ED-POC40F-BV02
BES03RZ		BES0003	BES03T2	BES0009
BES G06EE-NSC20B-S49G-003		BES G06EB-NSC40F-S49G	BES G06EH-NSC40F-S49G	BES G06ED-NSC40F-BV02
BES03T0		BES0002	BES03T3	BES0007
BES G06EE-NOC20B-S49G-003		BES G06EB-NOC40F-S49G	BES G06EH-NOC40F-S49G	BES G06ED-NOC40F-BV02
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2.5 V	2.5 V	2.5 V	2.5 V	2.5 V
75 V DC	75 V DC	75 V DC	75 V DC	250 V AC (□)
200 mA	200 mA	200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...70 °C	-25...70 °C	-25...70 °C	-25...70 °C	-25...70 °C
700 Hz	1.5 kHz	1.5 kHz	1.5 kHz	1.5 kHz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67	IP 68 per BWN Pr. 20
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
PBT	PBT	PA 12	PBT	PBT
M8 connector, 3-pin	M8 connector, 3-pin	M8 connector, 3-pin	M8 connector, 3-pin	2 m PVC cable, 3x0.14 mm ²



Inductive Sensors
Global DC 3-wire
Cylinder Designs
DC 3-/4-wire
DC 2-wire
AC/DC 2-wire
AC 2-wire
Special Properties
Analog Distance measurement
Accessories



DC 3-wire Inductive Global Sensors

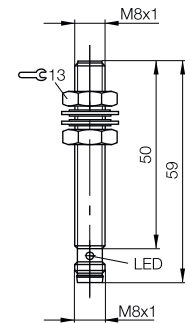
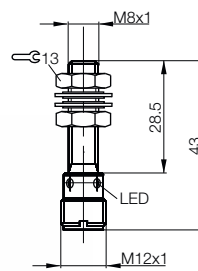
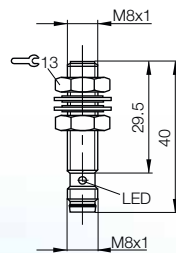
Cylinder designs, M8x1



Model		M8x1	M8x1	M8x1
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		1.5 mm	1.5 mm	1.5 mm
Assured switching distance s_a		0...1.2 mm	0...1.2 mm	0...1.2 mm
Switching distance marking		■	■	■
PNP, NO	Ordering code	BES00CJ	BES00CH	BES003C
	Part number	BES M08EE-PSC15B-S49G-003	BES M08EE-PSC15B-S04G-003	BES M08MI-PSC15B-S49G
PNP, normally closed	Ordering code	BES00CC	BES00CA	BES03P6
	Part number	BES M08EE-POC15B-S49G-003	BES M08EE-POC15B-S04G-003	BES M08MI-POC15B-S49G
NPN, NO	Ordering code	BES00C7	BES00C6	BES002K
	Part number	BES M08EE-NSC15B-S49G-003	BES M08EE-NSC15B-S04G-003	BES M08MI-NSC15B-S49G
NPN, NC	Ordering code	BES00C3	BES00C2	BES03PK
	Part number	BES M08EE-NOC15B-S49G-003	BES M08EE-NOC15B-S04G-003	BES M08MI-NOC15B-S49G
Supply voltage U_s		10...30 V DC	10...30 V DC	12...30 V DC
Voltage drop U_d at I_e max.		2.5 V	2.5 V	2 V
Rated insulation voltage U_i (protection class)		250 V AC (II)	250 V AC (II)	75 V DC
Rated operating current I_e		200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...70 °C	-25...70 °C	-25...70 °C
Switching frequency f max.		1 kHz	1 kHz	1 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Approvals		CE, cULus	CE, cULus	CE, cULus
Material	Housing	Stainless steel	Stainless steel	Brass-coated
	Sensing surface	PBT	PBT	PA 12
Connection		M8 connector, 3-pin	M12 connector, 4-pin	M8 connector, 3-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

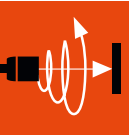
Additional cable lengths and PUR cable jacket material available on request.



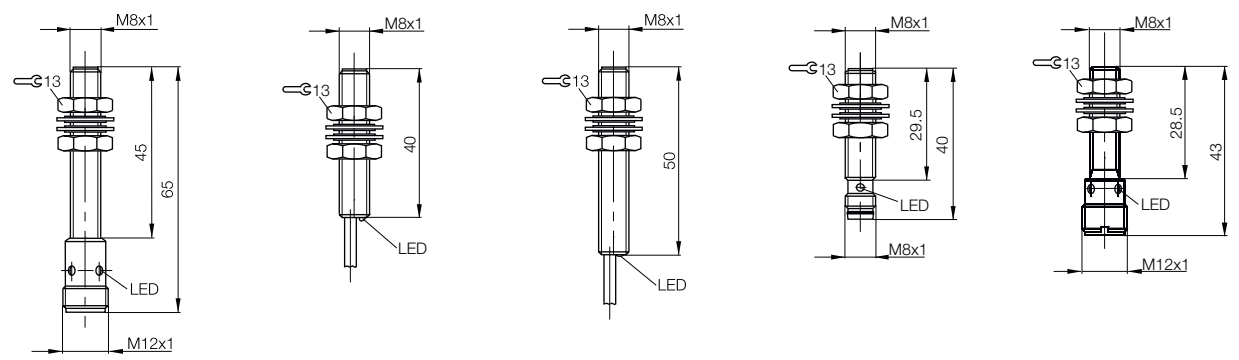
Global



M8x1	M8x1	M8x1	M8x1	M8x1
Flush	Flush	Flush	Flush	Flush
1.5 mm	1.5 mm	1.5 mm	2 mm	2 mm
0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.6 mm	0...1.6 mm
■	■	■	■ ■	■ ■
BES0027	BES00CU	BES0037	BES00CK	BES00FC
BES M08MH1-PSC15B-S04G	BES M08EF-PSC15B-BP02-003	BES M08MI-PSC15B-BV02	BES M08EE-PSC20B-S49G-003	BES M08EE-PSC20B-S04G-003
BES0026	BES00CR	BES0030	BES00CF	BES00CE
BES M08MH1-POC15B-S04G	BES M08EF-POC15B-BP02-003	BES M08MI-POC15B-BV02	BES M08EE-POC20B-S49G-003	BES M08EE-POC20B-S04G-003
BES0024	BES00CN	BES002F	BES00C9	BES00C8
BES M08MH1-NSC15B-S04G	BES M08EF-NSC15B-BP02-003	BES M08MI-NSC15B-BV02	BES M08EE-NSC20B-S49G-003	BES M08EE-NSC20B-S04G-003
BES0023	BES00CL	BES03PJ	BES00C5	BES00C4
BES M08MH1-NOC15B-S04G	BES M08EF-NOC15B-BP02-003	BES M08MI-NOC15B-BV02	BES M08EE-NOC20B-S49G-003	BES M08EE-NOC20B-S04G-003
12...30 V DC	10...30 V DC	12...30 V DC	10...30 V DC	10...30 V DC
2 V	2.5 V	2 V	2.5 V	2.5 V
75 V DC	250 V AC (□)	75 V DC	250 V AC (□)	250 V AC (□)
200 mA	200 mA	200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...70 °C	-25...70 °C	-25...70 °C	-25...70 °C	-25...70 °C
1 kHz	1 kHz	1 kHz	700 Hz	700 Hz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Brass-coated	Stainless steel	Brass-coated	Stainless steel	Stainless steel
PA 12	PBT	PA 12	PBT	PBT
M12 connector, 4-pin	2 m PUR cable, 3x0.14 mm ²	2 m PVC cable, 3x0.14 mm ²	M8 connector, 3-pin	M12 connector, 4-pin



Inductive Sensors
Global DC 3-wire
Cylinder Designs
DC 3-/4-wire
DC 2-wire
AC/DC 2-wire
AC 2-wire
Special Properties
Analog Distance measurement
Accessories



DC 3-wire Inductive Global Sensors

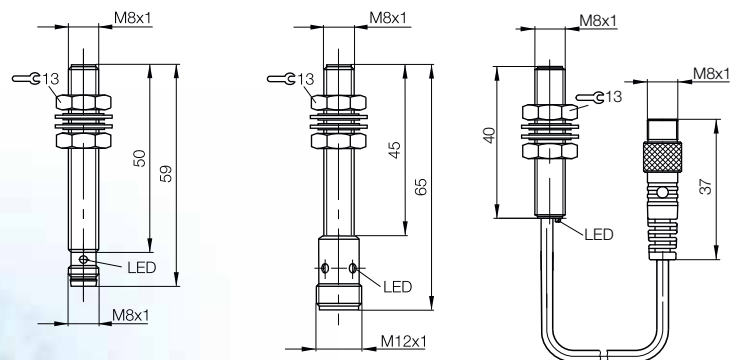
Cylinder designs, M8x1



Model		M8x1	M8x1	M8x1	
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush	
Rated switching distance s_n		2 mm	2 mm	2 mm	
Assured switching distance s_a		0...1.6 mm	0...1.6 mm	0...1.6 mm	
Switching distance marking		■ ■	■ ■	■ ■	
PNP, NO	Ordering code	BES003P	BES0028		
	Part number	BES M08MI-PSC20B-S49G	BES M08MH1-PSC20B-S04G		
PNP, normally closed	Ordering code	BES0033	BES03T5		
	Part number	BES M08MI-POC20B-S49G	BES M08MH1-POC20B-S04G		
NPN, NO	Ordering code	BES002U	BES0025	BES045P	
	Part number	BES M08MI-NSC20B-S49G	BES M08MH1-NSC20B-S04G	BES M08EF-NSC20B-BP00,3-GS49	
NPN, NC	Ordering code	BES03TJ	BES03T6		
	Part number	BES M08MI-NOC20B-S49G	BES M08MH1-NOC20B-S04G		
Supply voltage U_s		12...30 V DC	12...30 V DC	10...30 V DC	
Voltage drop U_d at I_e max.		2.5 V	2.5 V	2.5 V	
Rated insulation voltage U_i (protection class)		75 V DC	75 V DC	250 V AC (□)	
Rated operating current I_e		200 mA	200 mA	200 mA	
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	
Ambient temperature T_a		-25...70 °C	-25...70 °C	-25...70 °C	
Switching frequency f max.		700 Hz	700 Hz	700 Hz	
Output function indicator		Yellow LED	Yellow LED	Yellow LED	
Degree of protection as per IEC 60529		IP 67	IP 67	IP 68 per BWN Pr. 20	
Approvals		CE, cULus	CE, cULus	CE, cULus	
Material	Housing	Brass-coated	Brass-coated	Stainless steel	
	Sensing surface	PA 12	PA 12	PBT	
Connection		M8 connector, 3-pin	M12 connector, 4-pin	0.3 m PUR cable with M8 connector, 3-pin	

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

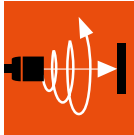
Additional cable lengths and PUR cable jacket material available on request.



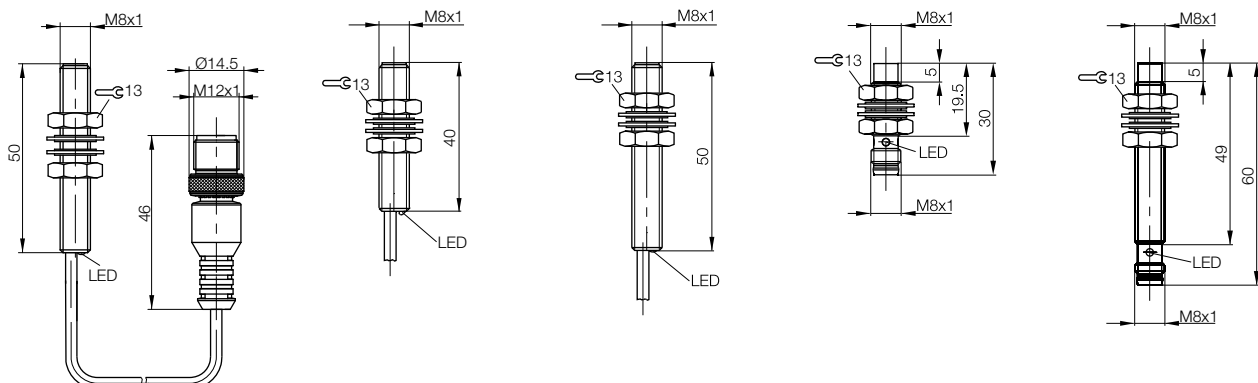
Global



M8x1 Flush 2 mm 0...1.6 mm ■■	M8x1 Flush 2 mm 0...1.6 mm ■■	M8x1 Flush 2 mm 0...1.6 mm ■■	M8x1 Not flush 4 mm 0...3.2 mm ■■	M8x1 Not flush 4 mm 0...3.2 mm ■■
BES003E BES M08MI-PSC20B-BP00,2-GS04	BES00CW BES M08EF-PSC20B-BP02-003	BES003K BES M08MI-PSC20B-BV02	BES000M BES M08EB-PSC40F-S49G	BES001J BES M08EH-PSC40F-S49G
	BES00CT BES M08EF-POC20B-BP02-003	BES03TH BES M08MI-POC20B-BV02	BES000L BES M08EB-POC40F-S49G	BES001F BES M08EH-POC40F-S49G
	BES00CP BES M08EF-NSC20B-BP02-003	BES002P BES M08MI-NSC20B-BV02	BES000K BES M08EB-NSC40F-S49G	BES001C BES M08EH-NSC40F-S49G
	BES00CM BES M08EF-NOC20B-BP02-003	BES03TF BES M08MI-NOC20B-BV02	BES000J BES M08EB-NOC40F-S49G	BES0019 BES M08EH-NOC40F-S49G
12...30 V DC 2.5 V 75 V DC 200 mA Yes/Yes/Yes -25...70 °C 700 Hz Yellow LED IP 67 CE, cULus Brass-coated PA 12 0.2 m PUR cable with M12 connector, 4-pin	10...30 V DC 2.5 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...70 °C 700 Hz Yellow LED IP 67 CE, cULus Stainless steel PBT 2 m PUR cable, 3x0.14 mm ²	12...30 V DC 2.5 V 75 V DC 200 mA Yes/Yes/Yes -25...70 °C 700 Hz Yellow LED IP 67 CE, cULus Brass-coated PA 12 2 m PVC cable, 3x0.14 mm ²	10...30 V DC 2.5 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...70 °C 1.5 kHz Yellow LED IP 68 per BWN Pr. 20 CE, cULus Stainless steel PBT M8 connector, 3-pin	10...30 V DC 2.5 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...70 °C 1.5 kHz Yellow LED IP 68 per BWN Pr. 20 CE, cULus Stainless steel PBT M8 connector, 3-pin



Inductive Sensors
Global DC 3-wire
Cylinder Designs
DC 3-/4-wire
DC 2-wire
AC/DC 2-wire
AC 2-wire
Special Properties
Analog Distance measurement
Accessories

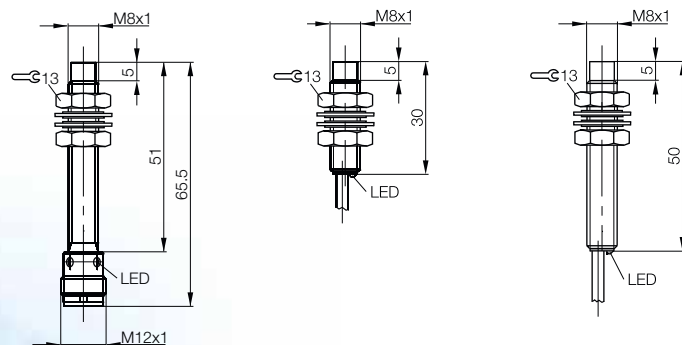




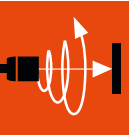
Model		M8x1	M8x1	M8x1
Installation type (observe instructions in the Basic Information chapter)		Not flush	Not flush	Not flush
Rated switching distance s_n		4 mm	4 mm	4 mm
Assured switching distance s_a		0...3.2 mm	0...3.2 mm	0...3.2 mm
Switching distance marking		■ ■	■ ■	■ ■
PNP, NO	Ordering code	BES001H	BES000Z	BES0017
	Part number	BES M08EH-PSC40F-S04G	BES M08ED-PSC40F-BV02	BES M08EG-PSC40F-BV02
PNP, normally closed	Ordering code	BES001E	BES000W	BES0015
	Part number	BES M08EH-POC40F-S04G	BES M08ED-POC40F-BV02	BES M08EG-POC40F-BV02
NPN, NO	Ordering code	BES001A	BES000T	BES0013
	Part number	BES M08EH-NSC40F-S04G	BES M08ED-NSC40F-BV02	BES M08EG-NSC40F-BV02
NPN, NC	Ordering code	BES0018	BES000P	BES0011
	Part number	BES M08EH-NOC40F-S04G	BES M08ED-NOC40F-BV02	BES M08EG-NOC40F-BV02
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		2.5 V	2.5 V	2.5 V
Rated insulation voltage U_i (protection class)		250 V AC (□)	250 V AC (□)	250 V AC (□)
Rated operating current I_e		200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...70 °C	-25...70 °C	-25...70 °C
Switching frequency f max.		1.5 kHz	1.5 kHz	1.5 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
Approvals		CE, cULus	CE, cULus	CE, cULus
Material	Housing	Stainless steel	Stainless steel	Stainless steel
	Sensing surface	PBT	PA 12	PBT
Connection		M12 connector, 4-pin	2 m PVC cable, 3x0.14 mm ²	2 m PVC cable, 3x0.14 mm ²

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request.

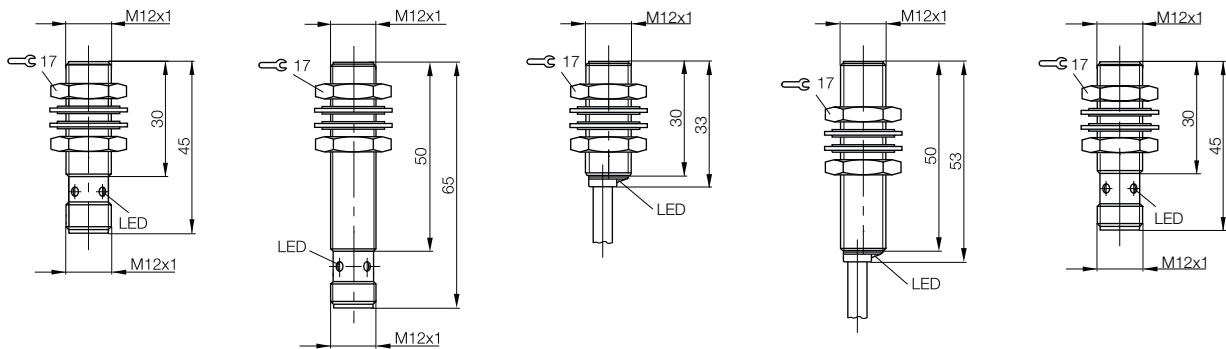


Global



M12x1	M12x1	M12x1	M12x1	M12x1
Flush	Flush	Flush	Flush	Flush
2 mm	2 mm	2 mm	2 mm	4 mm
0...1.6 mm	0...1.6 mm	0...1.6 mm	0...1.6 mm	0...3.2 mm
■	■	■	■	■ ■
BES00EE	BES0060	BES00E4	BES005U	BES00EF
BES M12ME-PSC20B-S04G-003	BES M12MI-PSC20B-S04G	BES M12MD-PSC20B-BP02-003	BES M12MI-PSC20B-BV02	BES M12ME-PSC40B-S04G-003
BES00EA	BES005F	BES00E2	BES00FP	BES00EC
BES M12ME-POC20B-S04G-003	BES M12MI-POC20B-S04G	BES M12MD-POC20B-BP02-003	BES M12MI-POC20B-BV02	BES M12ME-POC40B-S04G-003
BES00E8	BES0054	BES00E0	BES00FL	BES00E9
BES M12ME-NSC20B-S04G-003	BES M12MI-NSC20B-S04G	BES M12MD-NSC20B-BP02-003	BES M12MI-NSC20B-BV02	BES M12ME-NSC40B-S04G-003
BES00E6	BES004Y	BES00CY	BES03PR	BES00E7
BES M12ME-NOC20B-S04G-003	BES M12MI-NOC20B-S04G	BES M12MD-NOC20B-BP02-003	BES M12MI-NOC20B-BV02	BES M12ME-NOC40B-S04G-003
10...30 V DC	12...30 V DC	10...30 V DC	12...30 V DC	10...30 V DC
2 V	2.5 V	2 V	2.5 V	2.5 V
250 V AC (□)	250 V AC (□)	250 V AC (□)	250 V AC (□)	250 V AC (□)
200 mA	200 mA	200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...70 °C	-25...70 °C	-25...70 °C	-25...70 °C	-25...70 °C
1.2 kHz	1.2 kHz	1.2 kHz	1.2 kHz	300 Hz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 68 per BWN Pr. 20	IP 67	IP 68 per BWN Pr. 20	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Brass-coated	Brass-coated	Brass-coated	Brass-coated	Brass-coated
PBT	PA 12	PBT	PA 12	LCP
M12 connector, 4-pin	M12 connector, 4-pin	2 m PUR cable, 3x0.34 mm ²	2 m PVC cable, 3x0.34 mm ²	M12 connector, 4-pin

Inductive Sensors
Global DC 3-wire
Cylinder Designs
DC 3-/4-wire
DC 2-wire
AC/DC 2-wire
AC 2-wire
Special Properties
Analog Distance measurement
Accessories



DC 3-wire Inductive Global Sensors

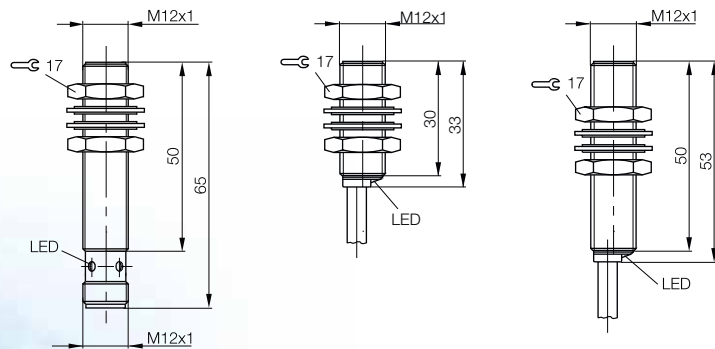
Cylinder designs, M12x1



		M12x1	M12x1	M12x1
Model		M12x1	M12x1	M12x1
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		4 mm	4 mm	4 mm
Assured switching distance s_a		0...3.2 mm	0...3.2 mm	0...3.2 mm
Switching distance marking		■ ■	■ ■	■ ■
PNP, NO	Ordering code	BES0068	BES00E5	BES0064
	Part number	BES M12MI-PSC40B-S04G	BES M12MD-PSC40B-BP02-003	BES M12MI-PSC40B-BV02
PNP, normally closed	Ordering code	BES005N	BES00E3	BES005L
	Part number	BES M12MI-POC40B-S04G	BES M12MD-POC40B-BP02-003	BES M12MI-POC40B-BV02
NPN, NO	Ordering code	BES0059	BES00E1	BES00FM
	Part number	BES M12MI-NSC40B-S04G	BES M12MD-NSC40B-BP02-003	BES M12MI-NSC40B-BV02
NPN, NC	Ordering code	BES004Z	BES00CZ	BES03PT
	Part number	BES M12MI-NOC40B-S04G	BES M12MD-NOC40B-BP02-003	BES M12MI-NOC40B-BV02
Supply voltage U_s		12...30 V DC	10...30 V DC	12...30 V DC
Voltage drop U_d at I_e max.		2.5 V	2.5 V	2.5 V
Rated insulation voltage U_i (protection class)		250 V AC (□)	250 V AC (□)	250 V AC (□)
Rated operating current I_e		200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...70 °C	-25...70 °C	-25...70 °C
Switching frequency f max.		500 Hz	300 Hz	500 Hz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 68 per BWN Pr. 20	IP 67	IP 68 per BWN Pr. 20
Approvals		CE, cULus	CE, cULus	CE, cULus
Material	Housing	Brass-coated	Brass-coated	Brass-coated
	Sensing surface	PA 12	LCP	PA 12
Connection		M12 connector, 4-pin	2 m PUR cable, 3x0.34 mm ²	2 m PVC cable, 3x0.34 mm ²

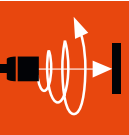
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request.





M12x1 Not flush 8 mm 0...6.4 mm ■ ■	M12x1 Not flush 8 mm 0...6.4 mm ■ ■	M12x1 Not flush 8 mm 0...6.4 mm ■ ■		
BES01PY BES M12MD-PSC80F-S04G	BES004N BES M12MG-PSC80F-S04G	BES004M BES M12MG-PSC80F-BV02		
BES01PU BES M12MD-POC80F-S04G	BES004K BES M12MG-POC80F-S04G	BES004J BES M12MG-POC80F-BV02		
BES01PT BES M12MD-NSC80F-S04G	BES004F BES M12MG-NSC80F-S04G	BES004E BES M12MG-NSC80F-BV02		
BES01PR BES M12MD-NOC80F-S04G	BES004A BES M12MG-NOC80F-S04G	BES0049 BES M12MG-NOC80F-BV02		
10...30 V DC 2.5 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...70 °C 800 Hz Yellow LED IP 68 per BWN Pr. 20 CE, cULus Brass-coated PBT M12 connector, 4-pin	10...30 V DC 2.5 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...70 °C 800 Hz Yellow LED IP 67 CE, cULus Brass-coated PBT M12 connector, 4-pin	10...30 V DC 2.5 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...70 °C 800 Hz Yellow LED IP 67 CE, cULus Brass-coated PBT 2 m PVC cable, 3x0.34 mm ²		



Inductive Sensors

Global DC 3-wire

Cylinder Designs

DC 3-/4-wire

DC 2-wire

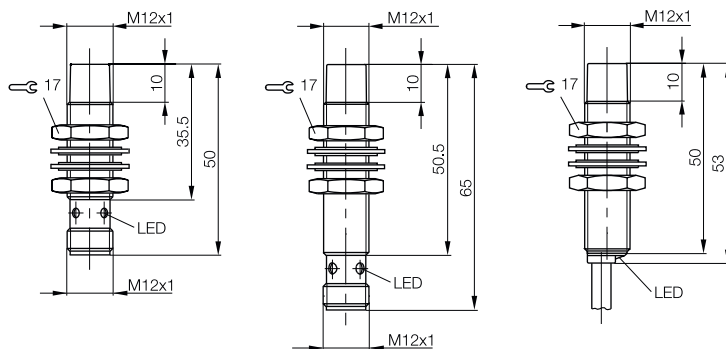
AC/DC 2-wire

AC 2-wire

Special Properties

Analog Distance measurement

Accessories



DC 3-wire Inductive Global Sensors

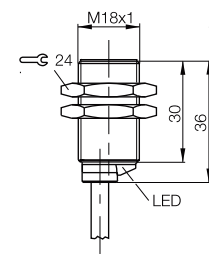
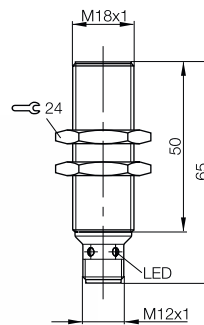
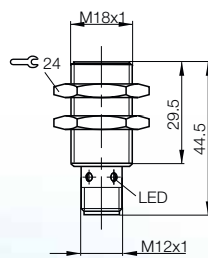
Cylinder designs, M18x1



Model		M18x1	M18x1	M18x1
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		5 mm	5 mm	5 mm
Assured switching distance s_a		0...4 mm	0...4 mm	0...4 mm
Switching distance marking		■	■	■
PNP, NO	Ordering code	BES00EY	BES0086	BES00EN
	Part number	BES M18ME-PSC50B-S04G-003	BES M18MI-PSC50B-S04G	BES M18MD-PSC50B-BP02-003
PNP, normally closed	Ordering code	BES00EU	BES043J	BES00EL
	Part number	BES M18ME-POC50B-S04G-003	BES M18MI-POC50B-S04G	BES M18MD-POC50B-BP02-003
NPN, NO	Ordering code	BES00ER		BES00EJ
	Part number	BES M18ME-NSC50B-S04G-003		BES M18MD-NSC50B-BP02-003
NPN, NC	Ordering code	BES03T7		BES03T8
	Part number	BES M18ME-NOC50B-S04G-003		BES M18MD-NOC50B-BP02-003
Supply voltage U_s		10...30 V DC	12...30 V DC	10...30 V DC
Voltage drop U_d at I_o max.		2 V	2.5 V	2 V
Rated insulation voltage U_i (protection class)		75 V DC	250 V AC (II)	75 V DC
Rated operating current I_o		200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...70 °C	-25...70 °C	-25...70 °C
Switching frequency f max.		700 Hz	700 Hz	700 Hz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 68 per BWN Pr. 20	IP 67
Approvals		CE, cULus	CE, cULus	CE, cULus
Material	Housing	Brass-coated	Brass-coated	Brass-coated
	Sensing surface	PA 12	PA 12	PA 12
Connection		M12 connector, 4-pin	M12 connector, 4-pin	2 m PUR cable, 3x0.34 mm ²

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

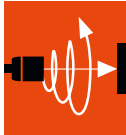
Additional cable lengths and PUR cable jacket material available on request.



Global



M18x1	M18x1	M18x1	M18x1	M18x1	M18x1
Flush	Flush	Flush	Flush	Flush	Flush
5 mm	8 mm	8 mm	8 mm	8 mm	8 mm
0...4 mm	0...6.4 mm	0...6.4 mm	0...6.4 mm	0...6.4 mm	0...6.4 mm
■	■ ■	■ ■	■ ■	■ ■	■ ■
BES0082	BES00EZ	BES008L	BES00EP	BES008E	BES008E
BES M18MI-PSC50B-BV02	BES M18ME-PSC80B-S04G-003	BES M18MI-PSC80B-S04G	BES M18MD-PSC80B-BP02-003	BES M18MI-PSC80B-BV02	BES M18MI-PSC80B-BV02
BES007R	BES00EW	BES03RP	BES00EM	BES03PY	BES03PY
BES M18MI-POC50B-BV02	BES M18ME-POC80B-S04G-003	BES M18MI-POC80B-S04G	BES M18MD-POC80B-BP02-003	BES M18MI-POC80B-BV02	BES M18MI-POC80B-BV02
BES007A	BES00ET	BES007L	BES00EK	BES00FE	BES00FE
BES M18MI-NSC50B-BV02	BES M18ME-NSC80B-S04G-003	BES M18MI-NSC80B-S04G	BES M18MD-NSC80B-BP02-003	BES M18MI-NSC80B-BV02	BES M18MI-NSC80B-BV02
BES03RR	BES03RN	BES0077	BES00EH	BES03T4	BES03T4
BES M18MI-NOC50B-BV02	BES M18ME-NOC80B-S04G-003	BES M18MI-NOC80B-S04G	BES M18MD-NOC80B-BP02-003	BES M18MI-NOC80B-BV02	BES M18MI-NOC80B-BV02
12...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	12...30 V DC	12...30 V DC
2.5 V	3.5 V	2.5 V	3.5 V	2.5 V	2.5 V
250 V AC (□)	75 V DC	250 V AC (□)	75 V DC	250 V AC (□)	250 V AC (□)
200 mA	130 mA	200 mA	130 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...70 °C	-25...70 °C	-25...70 °C	-25...70 °C	-25...70 °C	-25...70 °C
700 Hz	150 Hz	1 kHz	150 Hz	150 Hz	150 Hz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 68 per BWN Pr. 20	IP 67	IP 67	IP 67	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Brass-coated	Brass-coated	Brass-coated	Brass-coated	Brass-coated	Brass-coated
PA 12	PBT	PBT	PBT	PA 12	PA 12
2 m PVC cable, 3x0.34 mm ²	M12 connector, 4-pin	M12 connector, 4-pin	2 m PUR cable, 3x0.34 mm ²	2 m PVC cable, 3x0.34 mm ²	2 m PVC cable, 3x0.34 mm ²



Inductive Sensors

Global DC 3-wire

Cylinder Designs

DC 3-/4-wire

DC 2-wire

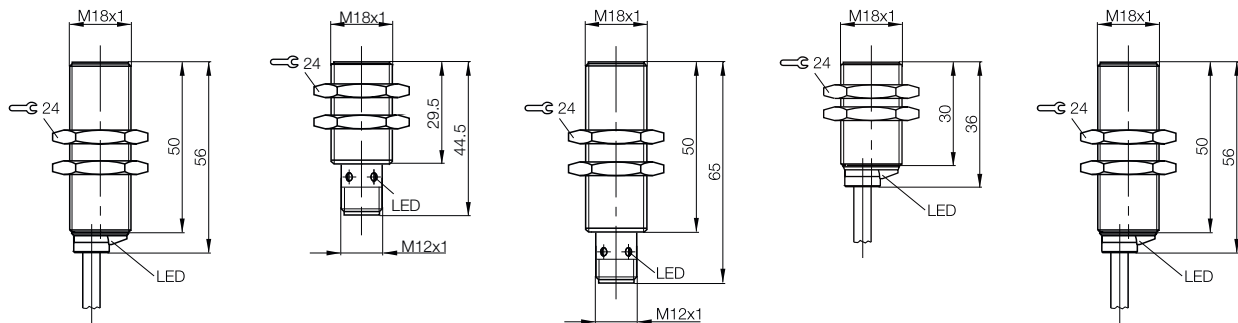
AC/DC 2-wire

AC 2-wire

Special Properties

Analog Distance measurement

Accessories



DC 3-wire Inductive Global Sensors

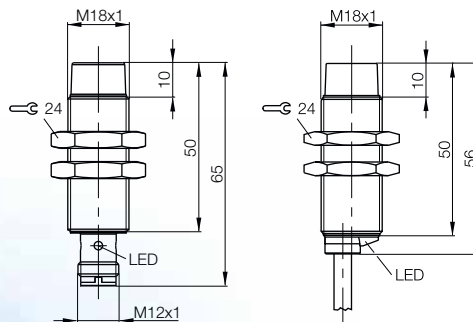
Cylinder designs, M18x1



Model		M18x1	M18x1	
Installation type (observe instructions in the Basic Information chapter)		Not flush	Not flush	
Rated switching distance s_n		16 mm	16 mm	
Assured switching distance s_a		0...13 mm	0...13 mm	
Switching distance marking		■ ■	■ ■	
PNP, NO	Ordering code	BES03RM	BES006Z	
	Part number	BES M18MG-PSC16F-S04G	BES M18MG-PSC16F-BV02	
PNP, normally closed	Ordering code	BES03RL	BES006U	
	Part number	BES M18MG-POC16F-S04G	BES M18MG-POC16F-BV02	
NPN, NO	Ordering code		BES006P	
	Part number		BES M18MG-NSC16F-BV02	
NPN, NC	Ordering code		BES006L	
	Part number		BES M18MG-NOC16F-BV02	
Supply voltage U_s		10...30 V DC	10...30 V DC	
Voltage drop U_d at I_o max.		2.5 V	2.5 V	
Rated insulation voltage U_i (protection class)		75 V DC (□)	250 V AC (□)	
Rated operating current I_o		200 mA	200 mA	
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	
Ambient temperature T_a		-25...70 °C	-25...70 °C	
Switching frequency f max.		800 Hz	800 Hz	
Output function indicator		Yellow LED	Yellow LED	
Degree of protection as per IEC 60529		IP 67	IP 67	
Approvals		CE, cULus	CE, cULus	
Material	Housing	Brass-coated	Brass-coated	
	Sensing surface	PBT	PBT	
Connection		M12 connector, 4-pin	2 m PVC cable, 3x0.34 mm ²	

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

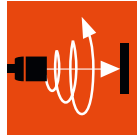
Additional cable lengths and PUR cable jacket material available on request.



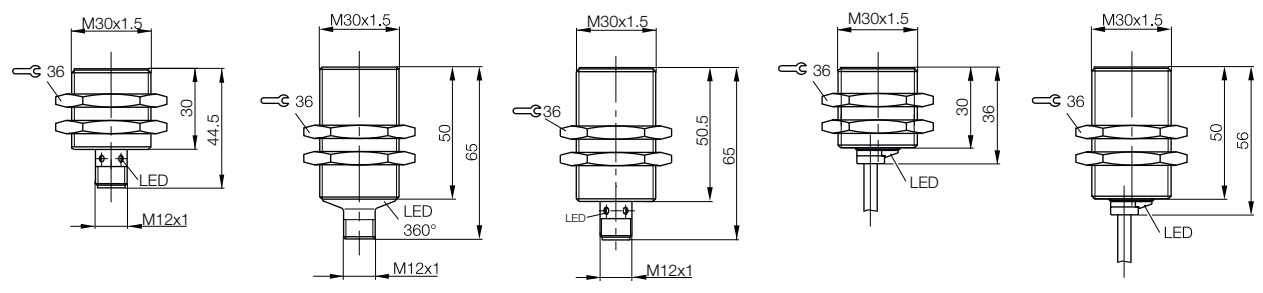
Global



M30x1.5	M30x1.5	M30x1.5	M30x1.5	M30x1.5
Flush	Flush	Flush	Flush	Flush
10 mm	10 mm	10 mm	10 mm	10 mm
0...8 mm	0...8.1 mm	0...8.1 mm	0...8.1 mm	0...8.1 mm
■	■	■	■	■
BES00F8	BES00A4	BES00A3	BES00F3	BES00A0
BES M30ME-PSC10B-S04G-003	BES M30MI-PSC10B-S04K	BES M30MI-PSC10B-S04G	BES M30MD-PSC10B-BP02-003	BES M30MI-PSC10B-BV02
BES00F6	BES009P	BES043H	BES03TC	BES009M
BES M30ME-POC10B-S04G-003	BES M30MI-POC10B-S04K	BES M30MI-POC10B-S04G	BES M30MD-POC10B-BP02-003	BES M30MI-POC10B-BV02
BES00F5	BES009H		BES00F0	BES009C
BES M30ME-NSC10B-S04G-003	BES M30MI-NSC10B-S04K		BES M30MD-NSC10B-BP02-003	BES M30MI-NSC10B-BV02
BES03TA	BES0097		BES03TE	BES0096
BES M30ME-NOC10B-S04G-003	BES M30MI-NOC10B-S04K		BES M30MD-NOC10B-BP02-003	BES M30MI-NOC10B-BV02
10...30 V DC	12...30 V DC	12...30 V DC	10...30 V DC	12...30 V DC
3.5 V	2.5 V	2.5 V	3.5 V	2.5 V
75 V DC	250 V AC (□)	75 V DC	75 V DC	250 V AC (□)
130 mA	200 mA	200 mA	130 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...70 °C	-25...70 °C	-25...70 °C	-25...70 °C	-25...70 °C
150 Hz	400 Hz	400 Hz	150 Hz	400 Hz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 68 per BWN Pr. 20	IP 67	IP67	IP 68 per BWN Pr. 20
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Brass-coated	Brass-coated	Brass-coated	Brass-coated	Brass-coated
PA 12	PA 12	PA 12	PA 12	PA 12
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	2 m PUR cable, 3x0.34 mm ²	2 m PVC cable, 3x0.34 mm ²



Inductive Sensors
Global DC 3-wire
Cylinder Designs
DC 3-/4-wire
DC 2-wire
AC/DC 2-wire
AC 2-wire
Special Properties
Analog Distance measurement
Accessories



DC 3-wire Inductive Global Sensors

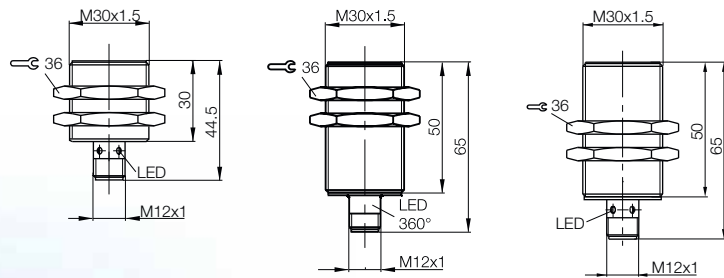
Cylinder designs, M30x1.5



Model		M30x1.5	M30x1.5	M30x1.5
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		15 mm	15 mm	15 mm
Assured switching distance s_a		0...12 mm	0...12.2 mm	0...12.2 mm
Switching distance marking		■ ■	■ ■	■ ■
PNP, NO	Ordering code	BES00F9	BES00AH	BES00AF
	Part number	BES M30ME-PSC15B-S04G-003	BES M30MI-PSC15B-S04K	BES M30MI-PSC15B-S04G
PNP, normally closed	Ordering code	BES00F7	BES009U	BES03RK
	Part number	BES M30ME-POC15B-S04G-003	BES M30MI-POC15B-S04K	BES M30MI-POC15B-S04G
NPN, NO	Ordering code		BES009J	
	Part number		BES M30MI-NSC15B-S04K	
NPN, NC	Ordering code		BES0098	
	Part number		BES M30MI-NOC15B-S04K	
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		3.5 V	2.5 V	2.5 V
Rated insulation voltage U_i (protection class)		75 DC	250 V AC (□)	250 V AC (□)
Rated operating current I_e		130 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...70 °C	-25...70 °C	-25...70 °C
Switching frequency f max.		75 Hz	100 Hz	100 Hz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Approvals		CE, cULus	CE, cULus	CE, cULus
Material	Housing	Brass-coated	Brass-coated	Brass-coated
	Sensing surface	PA 12	PA 12	PA 12
Connection		M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

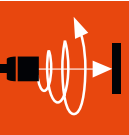
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request.

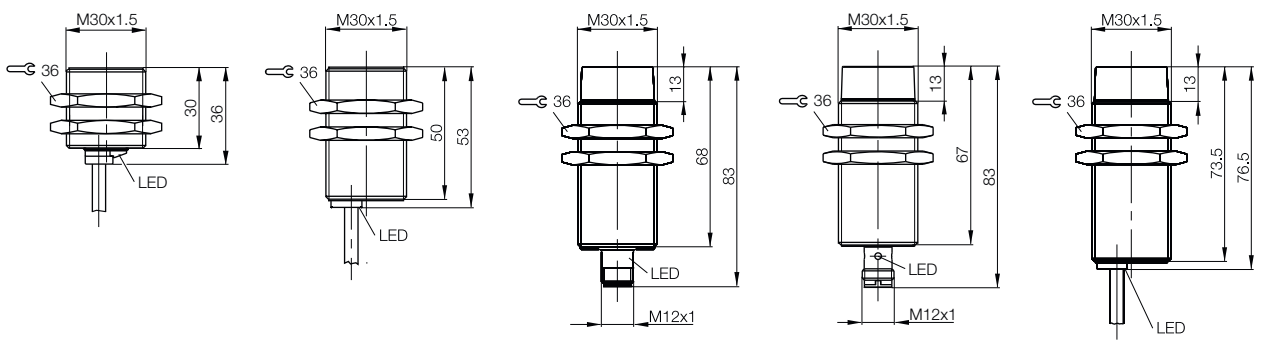


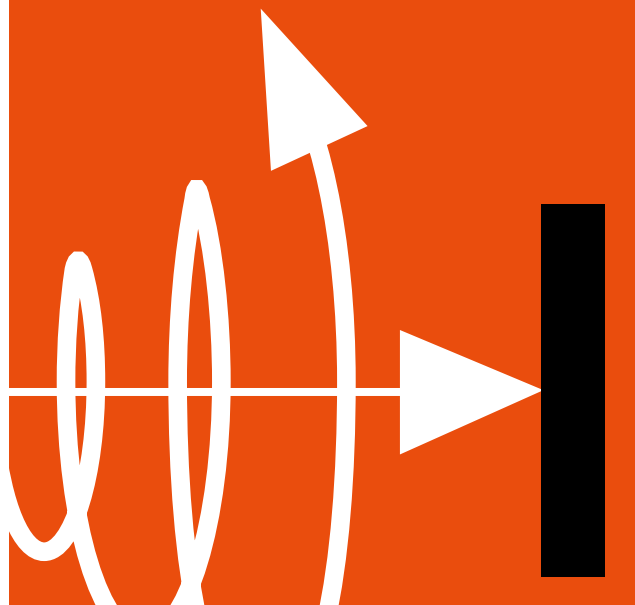


M30x1.5	M30x1.5	M30x1.5	M30x1.5	M30x1.5	M30x1.5
Flush	Flush	Not flush	Not flush	Not flush	Not flush
15 mm	15 mm	30 mm	30 mm	30 mm	30 mm
0...12 mm	0...12.2 mm	0...24 mm	0...24 mm	0...24 mm	0...24 mm
■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
BES00F4	BES00AA	BES00AZ	BES03RE	BES00AY	
BES M30MD-PSC15B-BP02-003	BES M30MI-PSC15B-BV02	BES M30MM-PSC30F-S04K	BES M30MM-PSC30F-S04G	BES M30MM-PSC30F-BV02	
BES00F2	BES009T	BES00AU	BES03RC	BES00AT	
BES M30MD-POC15B-BP02-003	BES M30MI-POC15B-BV02	BES M30MM-POC30F-S04K	BES M30MM-POC30F-S04G	BES M30MM-POC30F-BV02	
BES00F1	BES03RH	BES00AP		BES00AN	
BES M30MD-NSC15B-BP02-003	BES M30MI-NSC15B-BV02	BES M30MM-NSC30F-S04K		BES M30MM-NSC30F-BV02	
	BES03RJ	BES00AL		BES00AK	
	BES M30MI-NOC15B-BV02	BES M30MM-NOC30F-S04K		BES M30MM-NOC30F-BV02	
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	
3.5 V	2.5 V	2.5 V	2.5 V	2.5 V	
75 V DC	250 V AC (□)	250 V AC (□)	250 V AC (□)	250 V AC (□)	
130 mA	200 mA	200 mA	200 mA	200 mA	
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	
-25...70 °C	-25...70 °C	-25...70 °C	-25...70 °C	-25...70 °C	
75 Hz	100 Hz	300 Hz	300 Hz	300 Hz	
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED	
IP 67	IP 67	IP 67	IP 67	IP 67	
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus	
Brass-coated	Brass-coated	Brass-coated	Brass-coated	Brass-coated	
PA 12	PA 12	PBT	PBT	PBT	
2 m PUR cable, 3x0.34 mm ²	2 m PVC cable, 3x0.34 mm ²	M12 connector, 4-pin	M12 connector, 4-pin	2 m PVC cable, 3x0.34 mm ²	



- Inductive Sensors
- Global DC 3-wire
- Cylinder Designs
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- Analog Distance measurement
- Accessories





Inductive Sensors

DC 3-/4-wire inductive sensors

Our standard product line in 3- and 4-wire DC technology

Balluff offers something for everyone with this comprehensive product line of sensors from Ø 3 mm to 80×80 mm for practically every application in automation. These high-quality sensors are designed and manufactured according to worldwide standards and the latest technology. Our 100 % final inspection of all products guarantees that only carefully tested sensors leave our plants.



Cylinder Designs

Ø 3 mm	473
Ø 4 mm	474
M5x0.5	478
Ø 6.5 mm	482
Ø 8 mm	490
M8x1	491
M12x1	508
M18x1	516
M30x1.5	525

Block Designs

5x5 mm	531
8x8 mm	534
8x16x4 mm (R04)	540
10x30x6 mm (R03)	542
30x20x10 mm	543
16x30x10 mm	544
20x32x8 mm (R01)	545
20x50x10 mm	546
26x40x12 mm (R05)	548
42x48x22 mm	550
74x60.5x28 mm	551
40x40 mm (Unicompact)	553
40x40 mm (Unisensor)	557
80x80 mm (Maxisensor)	564



Basic information and definitions can be found on **page 934**.



DC 3-/4-wire Inductive Sensors

Inductive mini-sensors

High-performance and compact

Inductive mini-sensors guarantee position sensing in rough environments, and stand out due to an optimum price/performance ratio. They are easy to install and can be fully integrated even in narrow assemblies such as linear units, valves and actuators. As a result, position sensing is now possible where there was never space for a sensor before. Modules can be made even smaller. The low weight of the mini-sensors allows applications with extremely fast acceleration, so that pick-and-place is easy to manage.

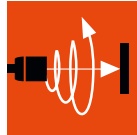


SuperShorties and slim designs

Inductive mini-sensors come with an especially small diameter: 3 mm, 4 mm and 5 mm. And they are available as compact SuperShorties with a housing length of just 6 mm. They are the shortest inductive sensors on the market.

- The most compact on the market: can be fully integrated
- Unmatched in thinness and, as SuperShorty, unmatched in their short length
- Low weight (0.7 g) for extreme accelerations





Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

Cylinder Designs

Block Designs

DC 2-wire

AC/DC 2-wire

AC 2-wire

Special Properties

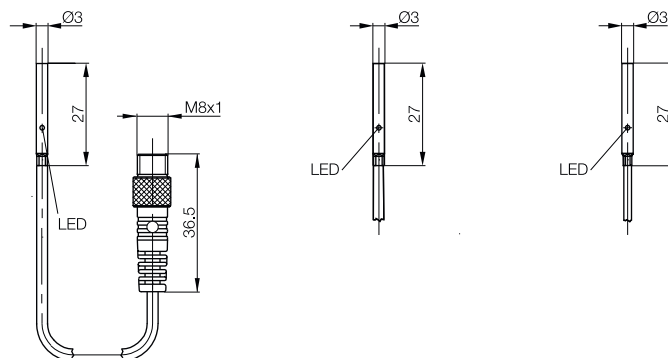
Analog Distance measurement

Special accessories

Model		Ø 3 mm	Ø 3 mm	Ø 3 mm
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		1 mm	1 mm	1 mm
Assured switching distance s_a		0...0.8 mm	0...0.8 mm	0...0.8 mm
Switching distance marking		■ ■	■ ■	■ ■
PNP, NO	Ordering code	BES00M5	BES00M3	
	Part number	BES 516-3044-G-E4-C-S49-00,3	BES 516-3044-G-E4-C-PU-02	
PNP, NC	Ordering code		BES00M7	
	Part number		BES 516-3045-G-E4-C-PU-02	
NPN, NO	Ordering code			BES00M9
	Part number			BES 516-3046-G-E4-L-PU-02
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		2.5 V	2.5 V	1.5 V
Rated insulation voltage U_i		75 V DC	75 V DC	75 V DC
Rated operating current I_e		100 mA	100 mA	100 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/No
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	0...+70 °C
Switching frequency f max.		2 kHz	2 kHz	5 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Approvals		CE, cULus	CE, cULus	CE
Special properties		Narrow design	Narrow design	Narrow design
Material	Housing	Stainless steel	Stainless steel	Stainless steel
	Sensing surface	POM	POM	POM
Connection		0.3 m PUR cable with M8 connector, 3-pin	2 m PUR cable, 3×0.1 mm ²	2 m PUR cable, 3×0.1 mm ²

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request



DC 3-/4-wire Inductive Sensors

Cylinder design, Ø 3 mm, Ø 4 mm

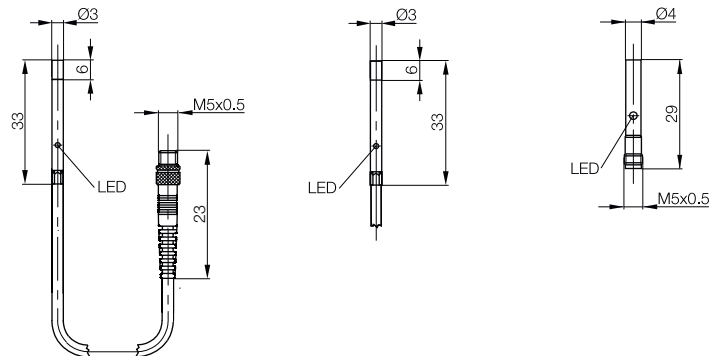


TRIPLEPROX

		Ø 3 mm	Ø 3 mm	Ø 4 mm
Model				
Installation type (observe instructions in the Basic Information chapter)		Not flush	Not flush	Flush
Rated switching distance s_n		3 mm	3 mm	0.8 mm
Assured switching distance s_a		0...2.3 mm	0...2.3 mm	0...0.65 mm
Switching distance marking		■ ■	■ ■ ■	■
PNP, NO	Ordering code	BES00MH	BES00ME	BES0122
	Part number	BES 516-3048-G-E4-C-S26-00,3	BES 516-3048-G-E4-C-PU-02	BES G04EC-PSC08B-S26G
PNP, NC	Ordering code		BES00MJ	BES0120
	Part number		BES 516-3049-G-E4-C-PU-02	BES G04EC-POC08B-S26G
NPN, NO	Ordering code			BES011Y
	Part number			BES G04EC-NSC08B-S26G
NPN, NC	Ordering code			BES011W
	Part number			BES G04EC-NOC08B-S26G
Supply voltage U_s		21.6...26.4 V DC	21.6...26.4 V DC	10...30 V DC
Voltage drop U_d at I_e max.		2.5 V	2.5 V	3 V
Rated insulation voltage U_i		75 V DC	75 V DC	75 V DC
Rated operating current I_e		50 mA	50 mA	100 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		0...+70 °C	0...+70 °C	-25...+70 °C
Switching frequency f max.		3 kHz	3 kHz	3 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Approvals		CE, cULus	CE, cULus	CE, cULus
Special properties		Narrow design	Narrow design, large switching distance	Narrow design
Material	Housing	Stainless steel	Stainless steel	Stainless steel
	Sensing surface	PET-C	PET-C	PBT
Connection		0.3 m PUR cable with M5 connector, 4-pin	2 m PUR cable, 3x0.1 mm ²	M5 connector, 4-pin

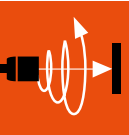
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request

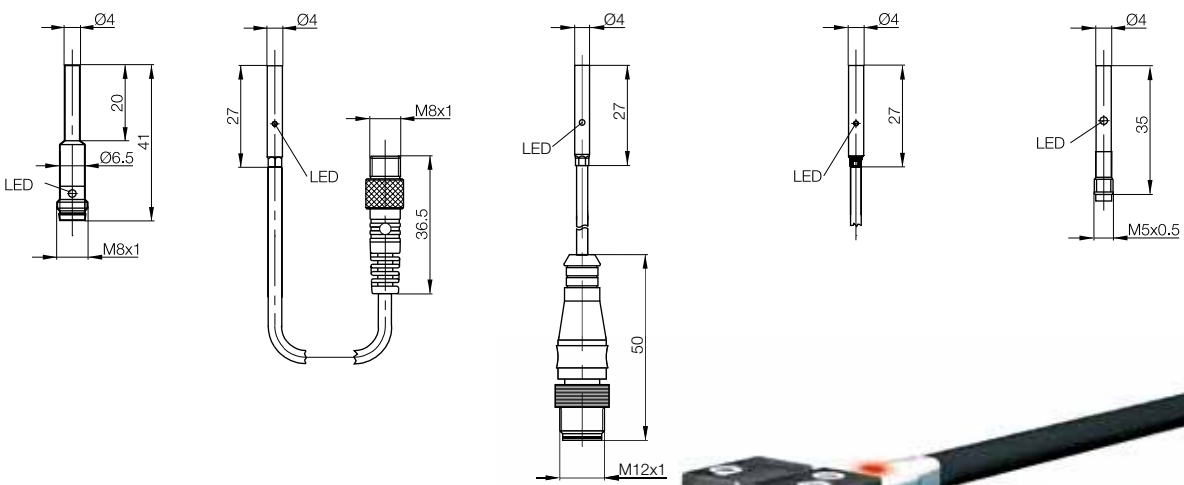




Ø 4 mm	Ø 4 mm	Ø 4 mm	Ø 4 mm	Ø 4 mm
Flush	Flush	Flush	Flush	Flush
0.8 mm	0.8 mm	0.8 mm	0.8 mm	1.5 mm
0...0.65 mm	0...0.65 mm	0...0.65 mm	0...0.65 mm	0...1.2 mm
■	■	■	■	■ ■
BES00J5	BES00J3	BES00J0	BES00HW	BES012F
BES 516-3007-E5-C-S49	BES 516-3007-E4-C-S49-00,3	BES 516-3007-E4-C-S4-00,3	BES 516-3007-E4-C-PU-02	BES G04ED-PSC15B-S26G
BES00K4	BES00K3		BES00K1	BES012A
BES 516-3017-E5-C-S49	BES 516-3017-E4-C-S49-00,3		BES 516-3017-E4-C-PU-02	BES G04ED-POC15B-S26G
			BES00JP	BES0126
			BES 516-3008-E4-C-PU-02	BES G04ED-NSC15B-S26G
BES00KF			BES00KC	BES0123
BES 516-3018-E5-C-S49			BES 516-3018-E4-C-PU-02	BES G04ED-NOC15B-S26G
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
3 V	3 V	3 V	3 V	3 V
75 V DC	75 V DC	75 V DC	75 V DC	75 V DC
100 mA	100 mA	100 mA	100 mA	100 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
3 kHz	3 kHz	3 kHz	3 kHz	3 kHz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Narrow design	Narrow design	Narrow design	Narrow design	Narrow design
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
PBT	PBT	PBT	PBT	PBT
M8 connector, 3-pin	0.3 m PUR cable with M8 connector, 3-pin	0.3 m PUR cable with M12 connector, 4-pin	2 m PUR cable, 3x0.14 mm ²	M5 connector, 4-pin



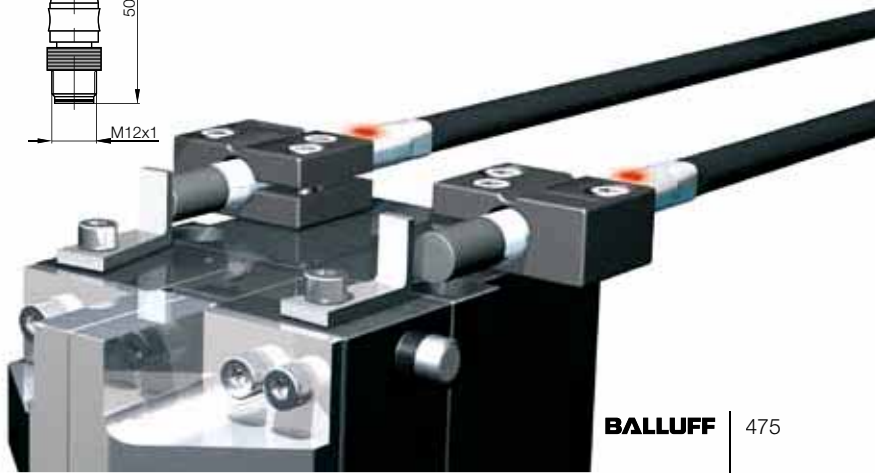
Inductive Sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder Designs
Block Designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Special Properties
Analog Distance measurement
Accessories



mini.s

Mini design – Maximum power

Inductive sensors Ø 3 mm: Large switching distance with smallest installation space. For even more function reserve and flexibility in application.



DC 3-/4-wire Inductive Sensors

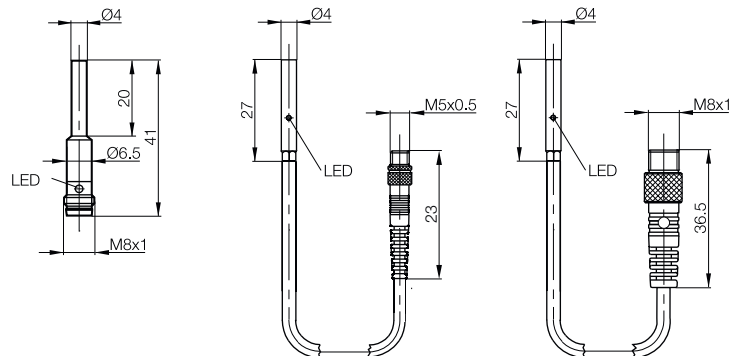
Cylinder designs, Ø 4 mm



Model		Ø 4 mm	Ø 4 mm	Ø 4 mm
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		1.5 mm	1.5 mm	1.5 mm
Assured switching distance s_a		0...1.2 mm	0...1.2 mm	0...1.2 mm
Switching distance marking		■ ■	■ ■	■ ■
PNP, NO	Ordering code	BES00JN	BES00J8	BES00JJ
	Part number	BES 516-3007-G-E5-C-S49	BES 516-3007-G-E4-C-S26-00,2	BES 516-3007-G-E4-C-S49-00,3
PNP, NC	Ordering code	BES00KA		BES00K9
	Part number	BES 516-3017-G-E5-C-S49		BES 516-3017-G-E4-C-S49-00,3
NPN, NO	Ordering code	BES00KO		
	Part number	BES 516-3008-G-E5-C-S49		
NPN, NC	Ordering code	BES00KK		
	Part number	BES 516-3018-G-E5-C-S49		
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		3 V	3 V	3 V
Rated insulation voltage U_i		75 V DC	75 V DC	75 V DC
Rated operating current I_e		100 mA	100 mA	100 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		3 kHz	3 kHz	3 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Approvals		CE, cULus	CE, cULus	CE, cULus
Special properties		Narrow design	Narrow design	Narrow design
Material	Housing	Stainless steel	Stainless steel	Stainless steel
	Sensing surface	PBT	PBT	PBT
Connection		M8 connector, 3-pin	0.2 m PUR cable with M5 connector, 4-pin	0.3 m PUR cable with M8 connector, 3-pin

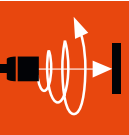
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request

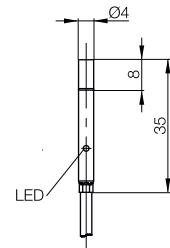
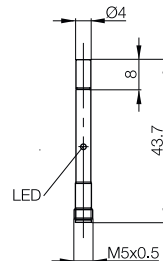
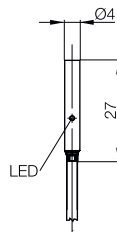
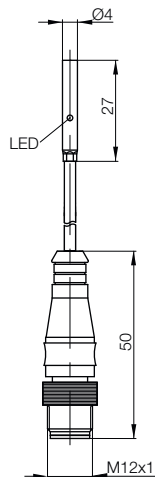
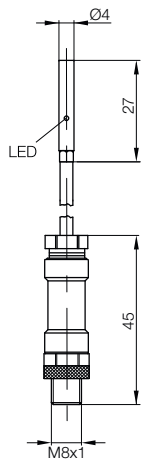




Ø 4 mm	Ø 4 mm	Ø 4 mm	Ø 4 mm	Ø 4 mm
Flush	Flush	Flush	Not flush	Not flush
1.5 mm	1.5 mm	1.5 mm	5 mm	5 mm
0...1.2 mm	0...1.2 mm	0...1.2 mm	0...4 mm	0...4 mm
■ ■	■ ■	■ ■	■ ■ ■	■ ■ ■
	BES00JA	BES00J6	BES012K	BES012H
	BES 516-3007-G-E4-C-S4-00,3	BES 516-3007-G-E4-C-PU-02	BES G04ED-PSC50F-S26G	BES G04ED-PSC50F-EP02
		BES00K5	BES012E	BES0127
		BES 516-3017-G-E4-C-PU-02	BES G04ED-POC50F-S26G	BES G04ED-NSC50F-EP02
BES0156		BES00JW	BES0129	
BES 516-3008-G-E4-C-S49-PU-00,3		BES 516-3008-G-E4-C-PU-02	BES G04ED-NSC50F-S26G	
		BES00KH	BES0125	
		BES 516-3018-G-E4-C-PU-02	BES G04ED-NOC50F-S26G	
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
3 V	3 V	3 V	2.5 V	2.5 V
75 V DC	75 V DC	75 V DC	75 V DC	75 V DC
100 mA	100 mA	100 mA	100 mA	100 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
1.8 kHz	3 kHz	3 kHz	3 kHz	3 kHz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Narrow design	Narrow design	Narrow design	Narrow design, large switching distance	Narrow design, large switching distance
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
PBT	PBT	PBT	PET-C	PET-C
0.3 m PUR cable with M8 connector, 3-pin	0.3 m PUR cable with M12 connector, 4-pin	2 m PUR cable, 3x0.14 mm ²	M5 connector, 4-pin	2 m PUR cable, 3x0.14 mm ²



- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- Cylinder Designs
- Block Designs
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- Analog Distance measurement
- Accessories



DC 3-/4-wire Inductive Sensors

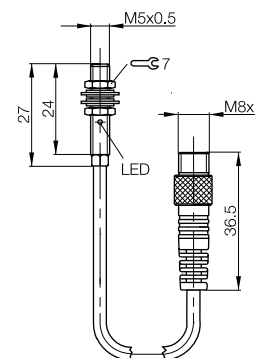
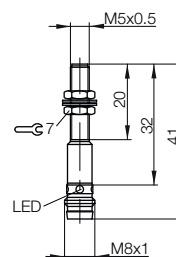
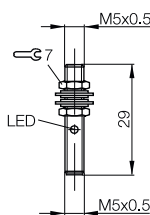
Cylinder design, M5x0.5



Model		M5x0.5	M5x0.5	M5x0.5
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		0.8 mm	0.8 mm	0.8 mm
Assured switching distance s_a		0...0.65 mm	0...0.65 mm	0...0.65 mm
Switching distance marking		■	■	■
PNP, NO	Ordering code	BES012Z	BES00H2	BES00H1
	Part number	BES M05EC-PSC08B-S26G	BES 516-3005-E5-C-S49	BES 516-3005-E4-C-S49-00,3
PNP, NC	Ordering code	BES012Y	BES00L1	
	Part number	BES M05EC-POC08B-S26G	BES 516-3022-E5-C-S49	
NPN, NO	Ordering code	BES012W	BES00HL	
	Part number	BES M05EC-NSC08B-S26G	BES 516-3006-E5-C-S49	
NPN, NC	Ordering code	BES012U	BES00L8	
	Part number	BES M05EC-NOC08B-S26G	BES 516-3023-E5-C-S49	
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		3 V	3 V	3 V
Rated insulation voltage U_i		75 V DC	75 V DC	75 V DC
Rated operating current I_e		100 mA	100 mA	100 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		3 kHz	3 kHz	3 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Approvals		CE, cULus	CE, cULus	CE, cULus
Special properties		Narrow design	Narrow design	Narrow design
Material	Housing	Stainless steel	Stainless steel	Stainless steel
	Sensing surface	PBT	PBT	PBT
Connection		M5 connector, 4-pin	M8 connector, 3-pin	0.3 m PUR cable with M8 connector, 3-pin

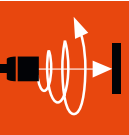
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request

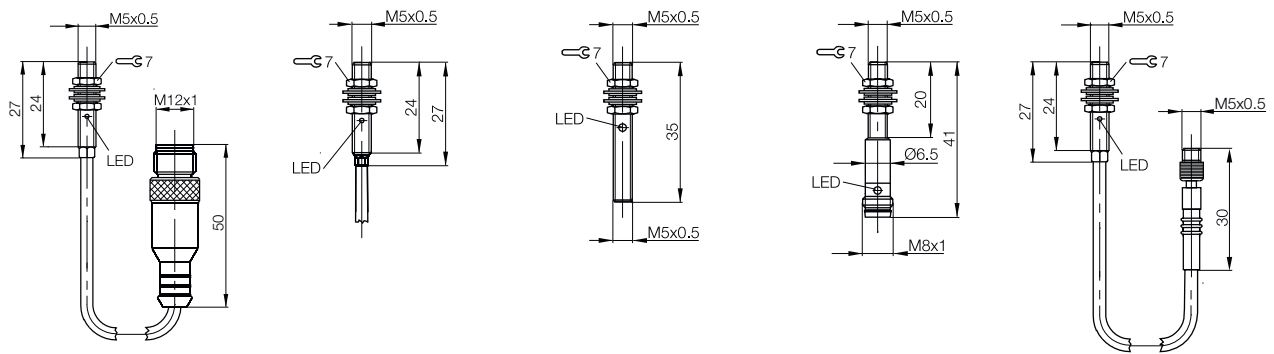




M5x0.5	M5x0.5	M5x0.5	M5x0.5	M5x0.5
Flush	Flush	Flush	Flush	Flush
0.8 mm	0.8 mm	1.5 mm	1.5 mm	1.5 mm
0...0.65 mm	0...0.65 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm
■	■	■■	■■	■■
BES00FW	BES00FT	BES013A	BES00HF	BES00H5
BES 516-3005-E4-C-S4-00,3	BES 516-3005-E4-C-PU-02	BES M05ED-PSC15B-S26G	BES 516-3005-G-E5-C-S49	BES 516-3005-G-E4-C-S26-00,3
	BES00KZ	BES0137		
	BES 516-3022-E4-C-PU-02	BES M05ED-POC15B-S26G		
	BES00HJ	BES0133		
	BES 516-3006-E4-C-PU-02	BES M05ED-NSC15B-S26G		
	BES00L6	BES0130		
	BES 516-3023-E4-C-PU-02	BES M05ED-NOC15B-S26G		
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
3 V	3 V	3 V	3 V	3 V
75 V DC	75 V DC	75 V DC	75 V DC	75 V DC
100 mA	100 mA	100 mA	100 mA	100 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
3 kHz	3 kHz	3 kHz	3 kHz	3 kHz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Narrow design	Narrow design	Narrow design	Narrow design	Narrow design
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
PBT	PBT	PBT	PBT	PBT
0.3 m PUR cable with M12 connector, 4-pin	2 m PUR cable, 3x0.14 mm ²	M5 connector, 4-pin	M8 connector, 3-pin	0.3 m PUR cable with M5 connector, 4-pin



Inductive Sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder Designs
Block Designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Special Properties
Analog Distance measurement
Accessories



DC 3-/4-wire Inductive Sensors

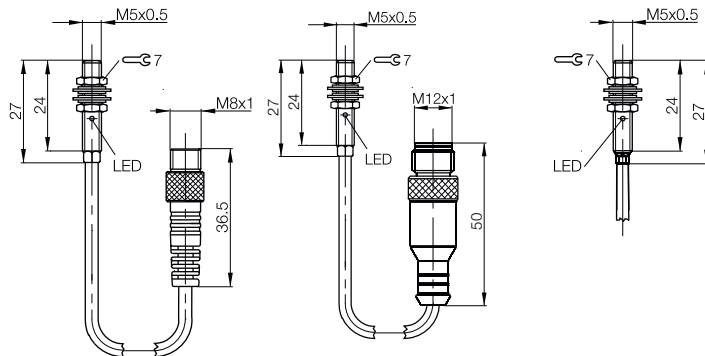
Cylinder design, M5x0.5



Model		M5x0.5	M5x0.5	M5x0.5
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		1.5 mm	1.5 mm	1.5 mm
Assured switching distance s_a		0...1.2 mm	0...1.2 mm	0...1.2 mm
Switching distance marking		■ ■	■ ■	■ ■
PNP, NO	Ordering code	BES00HC	BES00H7	BES00H3
	Part number	BES 516-3005-G-E4-C-S49-00,3	BES 516-3005-G-E4-C-S4-00,3	BES 516-3005-G-E4-C-PU-02
PNP, NC	Ordering code	BES00L4		BES00L2
	Part number	BES 516-3022-G-E4-C-S49-00,3		BES 516-3022-G-E4-C-PU-02
NPN, NO	Ordering code			BES00HM
	Part number			BES 516-3006-G-E4-C-PU-02
NPN, NC	Ordering code			
	Part number			
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		3 V	3 V	3 V
Rated insulation voltage U_i		75 V DC	75 V DC	75 V DC
Rated operating current I_e		100 mA	100 mA	100 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		3 kHz	3 kHz	3 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Approvals		CE, cULus	CE, cULus	CE, cULus
Special properties		Narrow design	Narrow design	Narrow design
Material	Housing	Stainless steel	Stainless steel	Stainless steel
	Sensing surface	PBT	PBT	PBT
Connection		0.3 m PUR cable with M8 connector, 3-pin	0.3 m PUR cable with M12 connector, 4-pin	2 m PUR cable, 3x0.14 mm ²

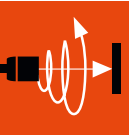
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request

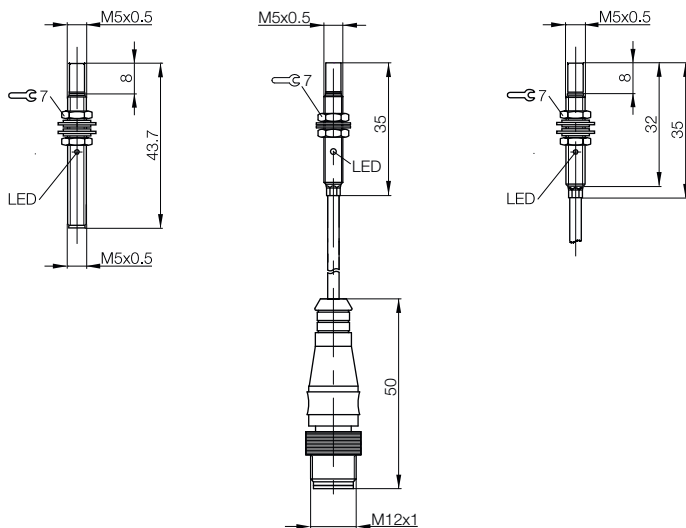




	TRIPLEPROX	TRIPLEPROX	TRIPLEPROX		
	M5x0.5	M5x0.5	M5x0.5		
	Not flush	Not flush	Not flush		
	5 mm	5 mm	5 mm		
	0...4 mm	0...4 mm	0...4 mm		
	■■■	■■■	■■■		
	BES013H	BES013C	BES013E		
	BES M05ED-PSC50F-S26G	BES M05ED-PSC50F-EP00,3-GS04	BES M05ED-PSC50F-EP02		
	BES0139				
	BES M05ED-POC50F-S26G				
	BES0136		BES0134		
	BES M05ED-NSC50F-S26G		BES M05ED-NSC50F-EP02		
	BES0132				
	BES M05ED-NOC50F-S26G				
	10...30 V DC	10...30 V DC	10...30 V DC		
	2.5 V	2.5 V	2.5 V		
	75 V DC	75 V DC	75 V DC		
	100 mA	100 mA	100 mA		
	Yes/Yes/Yes	No/Yes/Yes	Yes/Yes/Yes		
	-25...+70 °C	-25...+70 °C	-25...+70 °C		
	3 kHz	3 kHz	3 kHz		
	Yellow LED	Yellow LED	Yellow LED		
	IP 67	IP 67	IP 67		
	CE, cULus	CE, cULus	CE, cULus		
	Narrow design, large switching distance	Narrow design, large switching distance	Narrow design, large switching distance		
	Stainless steel	Stainless steel	Stainless steel		
	PET-C	PET-C	PET-C		
	M5 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin	2 m PUR cable, 3x0.14 mm ²		



- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- Cylinder Designs
- Block Designs
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- Analog Distance measurement
- Accessories



DC 3-/4-wire Inductive Sensors

Cylinder design, Ø 6.5 mm



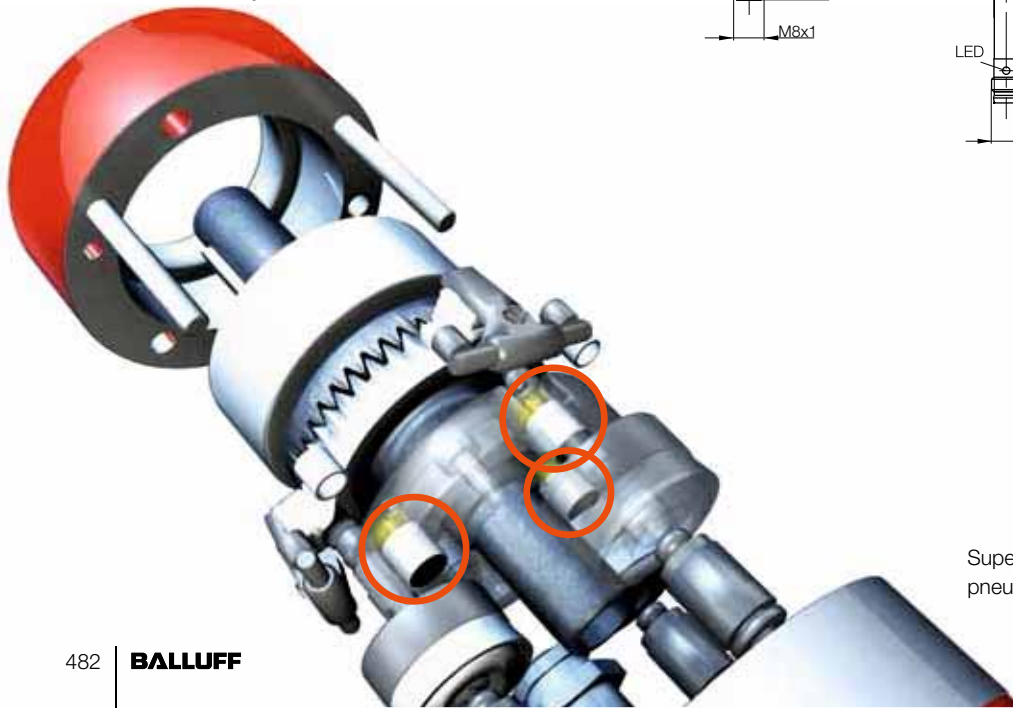
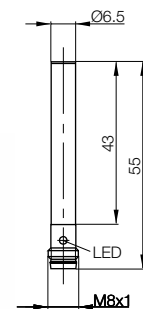
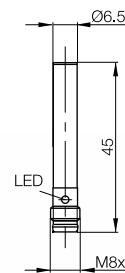
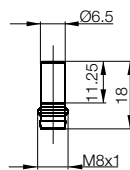
SUPERSHORTIES



Model		Ø 6.5 mm	Ø 6.5 mm	Ø 6.5 mm	
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush	
Rated switching distance s_n		1.5 mm	1.5 mm	1.5 mm	
Assured switching distance s_a		0...1.2 mm	0...1.2 mm	0...1.2 mm	
Switching distance marking		■	■	■	
PNP, NO	Ordering code	BES025N	BES00ZC	BES01KJ	
	Part number	BES G06EA-PSD15B-S49G	BES 516-371-E5-C-S49	BES 516-371-S49-C	
PNP, NC	Ordering code	BES025J			
	Part number	BES G06EA-POD15B-S49G			
NPN, NO	Ordering code	BES025F			
	Part number	BES G06EA-NSD15B-S49G			
NPN, NC	Ordering code	BES025A			
	Part number	BES G06EA-NOD15B-S49G			
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC	
Voltage drop U_d at I_o max.		2.5 V	2.5 V	2.5 V	
Rated insulation voltage U_i (protection class)		75 V DC	75 V DC	75 V DC	
Rated operating current I_o		150 mA	200 mA	200 mA	
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C	
Switching frequency f max.		3 kHz	3 kHz	3 kHz	
Output function indicator		No	Yellow LED	Yellow LED	
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67	
Approvals		CE, cULus	CE, cULus	CE, cULus	
Special properties		Short design			
Material	Housing	Stainless steel	Stainless steel	Stainless steel	
	Sensing surface	PBT	PBT	PBT	
Connection		M8 connector, 3-pin	M8 connector, 3-pin	M8 connector, 3-pin	

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request



SuperShorties monitor the function of a pneumatic stepping motor.



SUPERSHORTIES

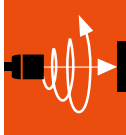


SUPERSHORTIES



SUPERSHORTIES

Ø 6.5 mm	Ø 6.5 mm	Ø 6.5 mm	Ø 6.5 mm	Ø 6.5 mm
Flush	Flush	Flush	Flush	Flush
1.5 mm	1.5 mm	1.5 mm	1.5 mm	1.5 mm
0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm
■	■	■	■	■
BES0253	BES0254	BES00ZA	BES00Z8	BES0256
BES G06E60-PSC15B-EP00,3-GS26	BES G06E60-PSC15B-EP00,3-GS49	BES 516-371-E4-C-S49-00,3	BES 516-371-E4-C-S4-00,3	BES G06E60-PSC15B-EP02
				BES0251
				BES G06E60-POC15B-EP02
	BES024Y			BES024Z
	BES G06E60-NSC15B-EP00,3-GS49			BES G06E60-NSC15B-EP02
				BES024W
				BES G06E60-NOC15B-EP02
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2.5 V	2.5 V	2.5 V	2.5 V	2.5 V
75 V DC	75 V DC	250 V AC (□)	250 V AC (□)	75 V DC
150 mA	150 mA	200 mA	200 mA	150 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
3 kHz	3 kHz	3 kHz	3 kHz	3 kHz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Short design	Short design			Short design
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
PBT	PBT	PBT	PBT	PBT
0.3 m PUR cable with M5 connector, 4-pin	0.3 m PUR cable with M8 connector, 3-pin	0.3 m PUR cable with M8 connector, 3-pin	0.3 m PUR cable with M12 connector, 4-pin	2 m PUR cable, 3x0.073 mm ²



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

Cylinder Designs

Block Designs

DC 2-wire

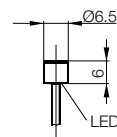
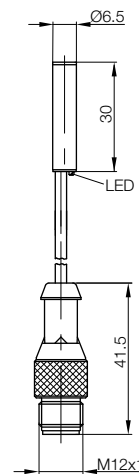
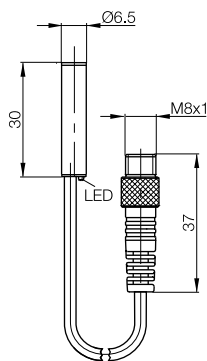
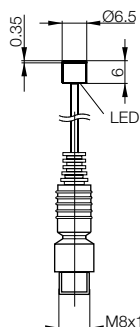
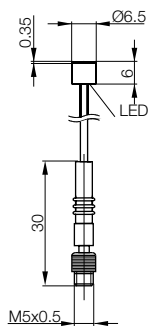
AC/DC 2-wire

AC 2-wire

Special Properties

Analog Distance measurement

Accessories





SUPERSHORTIES



SUPERSHORTIES

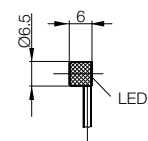
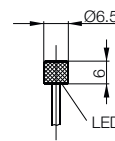
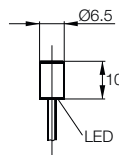


SUPERSHORTIES

Model		Ø 6.5 mm	Ø 6.5 mm	Ø 6.5 mm
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		1.5 mm	1.5 mm	1.5 mm
Assured switching distance s_a		0...1.2 mm	0...1.2 mm	0...1.2 mm
Switching distance marking		■	■	■
PNP, NO	Ordering code	BES025M	BES026F	BES0269
	Part number	BES G06EA-PSC15B-EP02	BES K06K60-PSC15B-EP02	BES K06K40-PSC15B-FP02
PNP, NC	Ordering code	BES025H	BES026E	BES0262
	Part number	BES G06EA-POC15B-EP02	BES K06K60-POC15B-EP02	BES K06K40-POC15B-FP02
NPN, NO	Ordering code	BES025E	BES026C	BES0261
	Part number	BES G06EA-NSC15B-EP02	BES K06K60-NSC15B-EP02	BES K06K40-NSC15B-FP02
NPN, NC	Ordering code	BES0259	BES026A	BES0260
	Part number	BES G06EA-NOC15B-EP02	BES K06K60-NOC15B-EP02	BES K06K40-NOC15B-FP02
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_o max.		2.5 V	2.5 V	2.5 V
Rated insulation voltage U_i (protection class)		75 V DC	75 V DC	75 V DC
Rated operating current I_o		150 mA	150 mA	150 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		3 kHz	3 kHz	3 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 65	IP 65
Approvals		CE, cULus	CE, cULus	CE, cULus
Special properties		Short design	Short design	Short design
Material	Housing	Stainless steel	PBT	PBT
	Sensing surface	PBT	PBT	PBT
Connection		2 m PUR cable, 3x0.073 mm ²	2 m PUR cable, 3x0.073 mm ²	2 m PUR cable, 3x0.073 mm ²

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request

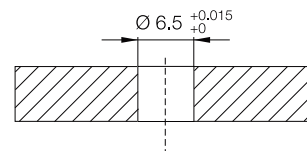


Features

- Simple installation with glue-in sensor
- Flexible use with optional radial cable outlet

Recommendation for gluing in the sensor Ø 6.5 mm smooth

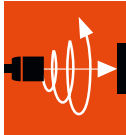
Prepare and clean drill hole and sensor according to the specifications of the glue used. Coat hole and sensor with adhesive and position sensor in hole. Allow to cure. For additional instructions, see the data sheet.





SUPERSHORTIES

Ø 6.5 mm	Ø 6.5 mm	Ø 6.5 mm	Ø 6.5 mm	Ø 6.5 mm
Flush	Flush	Flush	Flush	Flush
1.5 mm	1.5 mm	1.5 mm	2 mm	2 mm
0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.6 mm	0...1.6 mm
■	■	■	■ ■	■ ■
BES00Z2	BES00Z5	BES01K7		BES037K
BES 516-371-E4-C-02	BES 516-371-E4-C-PU-02	BES 516-371-EO-C-02		BES 516-371-SA15-C-S49
			BES025K	
			BES G06EA-POD20B-S49G	
BES00ZW	BES0100	BES01L1		
BES 516-372-E4-C-02	BES 516-372-E4-C-PU-02	BES 516-372-EO-C-02		
			BES025C	
			BES G06EA-NOD20B-S49G	
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2.5 V	2.5 V	2.5 V	2.5 V	2.5 V
250 V AC (□)	250 V AC (□)	250 V AC (□)	75 V DC	75 V DC
200 mA	200 mA	200 mA	150 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
3 kHz	3 kHz	3 kHz	3 kHz	1.5 kHz
Yellow LED	Yellow LED	Yellow LED	No	Yellow LED
IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Stainless steel	Stainless steel	Stainless steel	Short design Stainless steel	Stainless steel
PBT	PBT	PBT	PBT	PBT
2 m PVC cable, 3x0.14 mm ²	2 m PUR cable, 3x0.14 mm ²	2 m PVC cable, 3x0.14 mm ²	M8 connector, 3-pin	M8 connector, 3-pin



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

Cylinder Designs

Block Designs

DC 2-wire

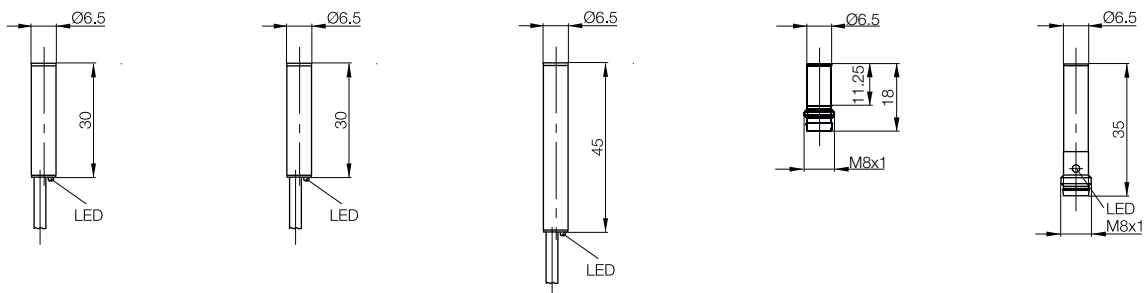
AC/DC 2-wire

AC 2-wire

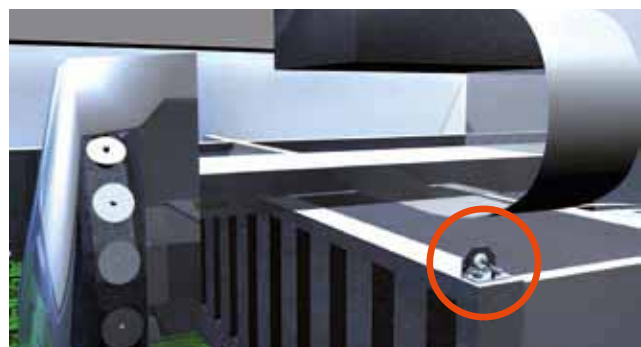
Special Properties

Analog Distance measurement

Accessories



SuperShorties in electronics production: Automatic board assembler



DC 3-/4-wire Inductive Sensors

Cylinder design, Ø 6.5 mm

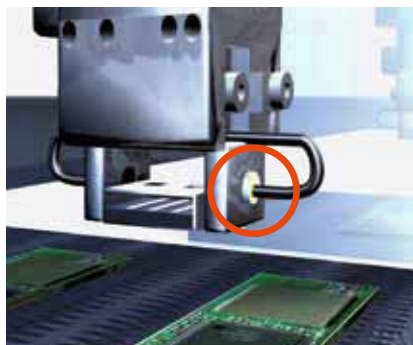
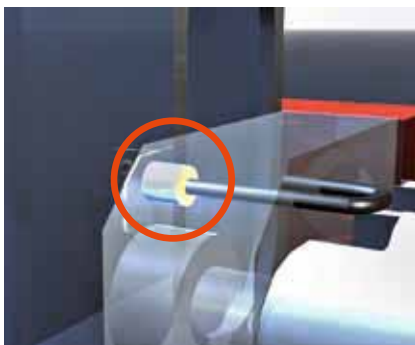
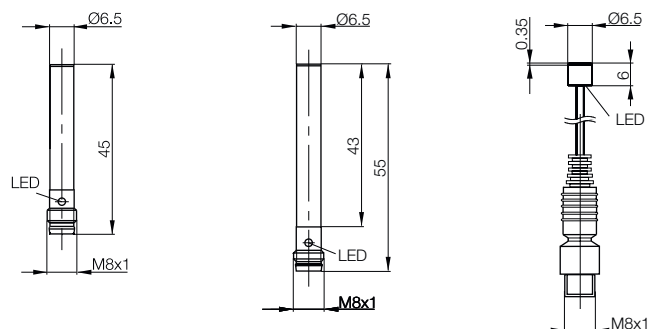


SUPERSHORTIES

Model		Ø 6.5 mm	Ø 6.5 mm	Ø 6.5 mm
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		2 mm	2 mm	2 mm
Assured switching distance s_a		0...1.6 mm	0...1.6 mm	0...1.6 mm
Switching distance marking		■ ■	■ ■	■ ■
PNP, NO	Ordering code	BES00ZU	BES01KH	BES0257
	Part number	BES 516-371-G-E5-C-S49	BES 516-371-G-S49-C	BES G06E60-PSC20B-EP00,3-GS49
PNP, NC	Ordering code	BES00KY		
	Part number	BES 516-3021-G-E5-C-S49		
NPN, NO	Ordering code	BES0107	BES03RU	
	Part number	BES 516-372-G-E5-C-S49	BES G06EH-NSC20B-S49G	
NPN, NC	Ordering code		BES03RW	
	Part number		BES G06EH-NOC20B-S49G	
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_o max.		2.5 V	2.5 V	2.5 V
Rated insulation voltage U_i (protection class)		75 V DC	75 V DC	75 V DC
Rated operating current I_o		200 mA	200 mA	150 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		1.5 kHz	1.5 kHz	3 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Approvals		CE, cULus	CE, cULus	CE, cULus
Special properties				Short design
Material	Housing	Stainless steel	Stainless steel	Stainless steel
	Sensing surface	PBT	PBT	PBT
Connection		M8 connector, 3-pin	M8 connector, 3-pin	0.3 m PUR cable with M8 connector, 3-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

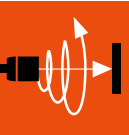
Additional cable lengths and PUR cable jacket material available on request



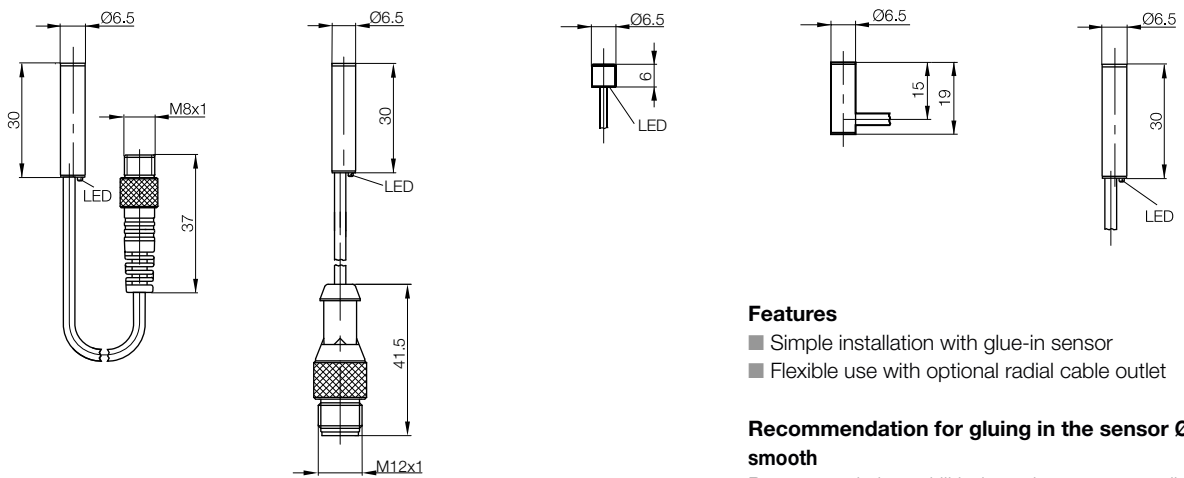


SUPERSHORTIES

Ø 6.5 mm	Ø 6.5 mm	Ø 6.5 mm	Ø 6.5 mm	Ø 6.5 mm
Flush	Flush	Flush	Flush	Flush
2 mm	2 mm	2 mm	2 mm	2 mm
0...1.6 mm	0...1.6 mm	0...1.6 mm	0...1.6 mm	0...1.6 mm
■ ■	■ ■	■ ■	■ ■	■ ■
BES00ZR	BES00ZN	BES0258	BES01KW	BES00ZF
BES 516-371-G-E4-C-S49-00,3	BES 516-371-G-E4-C-S4-00,2	BES G06E60-PSC20B-EP02	BES 516-371-SA13-PU-02	BES 516-371-G-E4-C-02
BES03F8	BES00KU			BES00KP
BES 516-3021-G-E4-C-S49-00,3	BES 516-3021-G-E4-C-S4-00,2			BES 516-3021-G-E4-C-02
BES0106		BES0250		BES0102
BES 516-372-G-E4-C-S49-00,3		BES G06E60-NSC20B-EP02		BES 516-372-G-E4-C-02
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2.5 V	2.5 V	2.5 V	2.5 V	2.5 V
250 V AC (□)	250 V AC (□)	75 V DC	75 V DC	250 V AC (□)
200 mA	200 mA	150 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
1.5 kHz	1.5 kHz	3 kHz	2 kHz	1.5 kHz
Yellow LED	Yellow LED	Yellow LED	No	Yellow LED
IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 67	IP 65	IP 68 per BWN Pr. 20
CE, cULus	CE, cULus	CE, cULus	CE	CE, cULus
		Short design		
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
PBT	PBT	PBT	PBT	PBT
0.3 m PUR cable with M8 connector, 3-pin	0.2 m PUR cable with M12 connector, 4-pin	2 m PUR cable, 3×0.073 mm ²	2 m PUR cable, 3×0.14 mm ²	2 m PVC cable, 3×0.14 mm ²



- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- Cylinder Designs
- Block Designs
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- Analog Distance measurement
- Accessories

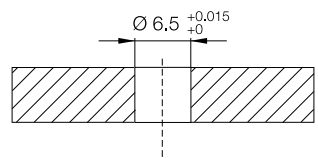


Features

- Simple installation with glue-in sensor
- Flexible use with optional radial cable outlet

Recommendation for gluing in the sensor Ø 6.5 mm smooth

Prepare and clean drill hole and sensor according to the specifications of the glue used. Coat hole and sensor with adhesive and position sensor in hole. Allow to cure. For additional instructions, see the data sheet.



DC 3-/4-wire Inductive Sensors

Cylinder design, Ø 6.5 mm



TRIPLEPROX



TRIPLEPROX

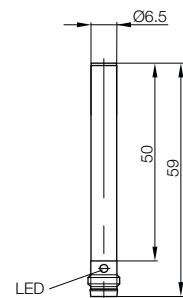
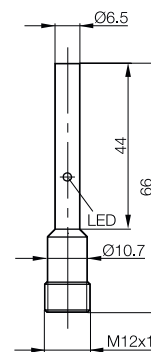
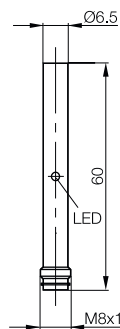


HYPERPROX

Model		Ø 6.5 mm	Ø 6.5 mm	Ø 6.5 mm
Installation type (observe instructions in the Basic Information chapter)		Quasi-flush	Quasi-flush	Quasi-flush
Rated switching distance s_n		3 mm	3 mm	4 mm
Assured switching distance s_a		0...2.4 mm	0...2.4 mm	0...2.9 mm
Switching distance marking		■■■	■■■	■■■■
PNP, NO	Ordering code	BES02UY	BES02UR	BES01NT
	Part number	BES G06MI-PSC30B-S49G	BES G06MH1-PSC30B-S04G	BES G06MI-PSC40B-S49G
PNP, NC	Ordering code	BES02UW		
	Part number	BES G06MI-POC30B-S49G		
NPN, NO	Ordering code	BES02UU	BES02UP	BES01NR
	Part number	BES G06MI-NSC30B-S49G	BES G06MH1-NSC30B-S04G	BES G06MI-NSC40B-S49G
NPN, NC	Ordering code	BES02UT		
	Part number	BES G06MI-NOC30B-S49G		
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_o max.		2 V	2 V	2.8 V
Rated insulation voltage U_i (protection class)		75 V DC	75 V DC	75 V DC
Rated operating current I_o		200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	0...+60 °C
Switching frequency f max.		1 kHz	1 kHz	700 Hz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67	IP 65
Approvals		CE	CE	CE, cULus
Special properties		Large switching distance	Large switching distance	Large switching distance
Material	Housing	Brass-coated	Brass-coated	Brass-coated
	Sensing surface	PBT	PBT	PBT
Connection		M8 connector, 3-pin	M12 connector, 4-pin	M8 connector, 3-pin

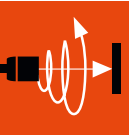
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request

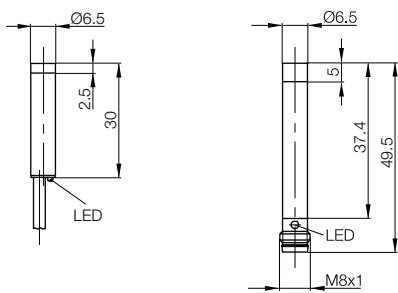




Ø 6.5 mm	Ø 6.5 mm			
Not flush	Not flush			
2.5 mm	4 mm			
0...2 mm	0...3.2 mm			
■	■ ■			
BES00TZ	BES01NP			
BES 516-349-E4-C-02	BES G06EF-PSC40F-S49G			
BES00U6				
BES 516-350-E4-C-02				
10...30 V DC	10...30 V DC			
2.5 V	2.5 V			
250 V AC (□)	75 V DC			
200 mA	200 mA			
Yes/Yes/Yes	Yes/Yes/Yes			
-25...+70 °C	-25...+70 °C			
2 kHz	1.5 kHz			
Yellow LED	Yellow LED			
IP 68 per BWN Pr. 20	IP 67			
CE, cULus	CE, cULus			
Stainless steel	Stainless steel			
PBT	PBT			
2 m PVC cable, 3x0.14 mm ²	M8 connector, 3-pin			



Inductive Sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder Designs
Block Designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Special Properties
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DC 3-/4-wire Inductive Sensors

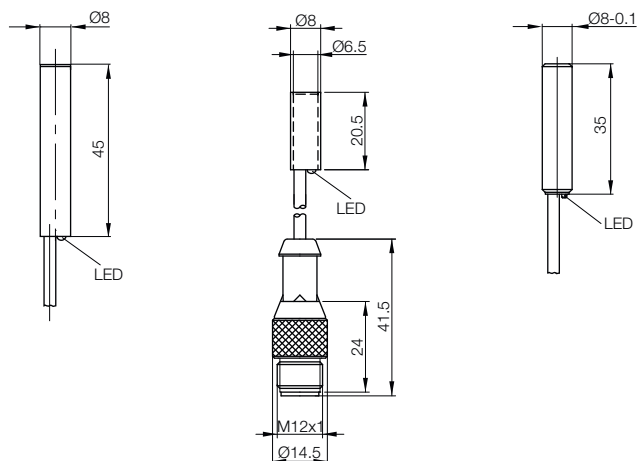
Cylinder designs, Ø 8 mm



Model		Ø 8 mm	Ø 8 mm	Ø 8 mm
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		1.5 mm	2 mm	2 mm
Assured switching distance s_a		0...1.2 mm	0...1.6 mm	0...1.6 mm
Switching distance marking		■	■■	■■
PNP, NO	Ordering code	BES01NY	BES0388	BES012N
	Part number	BES G08EG-PSC15B-BV02	BES G08EC-PSC20B-EP01-GS04-516	BES G08EE-PSC20B-BV02
PNP, NC	Ordering code			
	Part number			
NPN, NO	Ordering code			
	Part number			
NPN, NC	Ordering code			
	Part number			
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_o max.		2.5 V	2.5 V	2.5 V
Rated insulation voltage U_i (protection class)		250 V AC (□)	75 V DC	250 V AC (□)
Rated operating current I_o		200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		3 kHz	2 kHz	1.5 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 68 per BWN Pr. 20	IP 67	IP 68 per BWN Pr. 20
Approvals		CE, cULus	CE	CE, cULus
Special properties				
Material	Housing	Stainless steel	Stainless steel	Stainless steel
	Sensing surface	PBT	Ceramic	PBT
Connection		2 m PVC cable, 3×0.14 mm ²	1 m PUR cable with M12 connector, 4-pin	2 m PVC cable, 3×0.14 mm ²

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

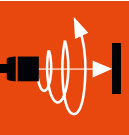
Additional cable lengths and PUR cable jacket material available on request



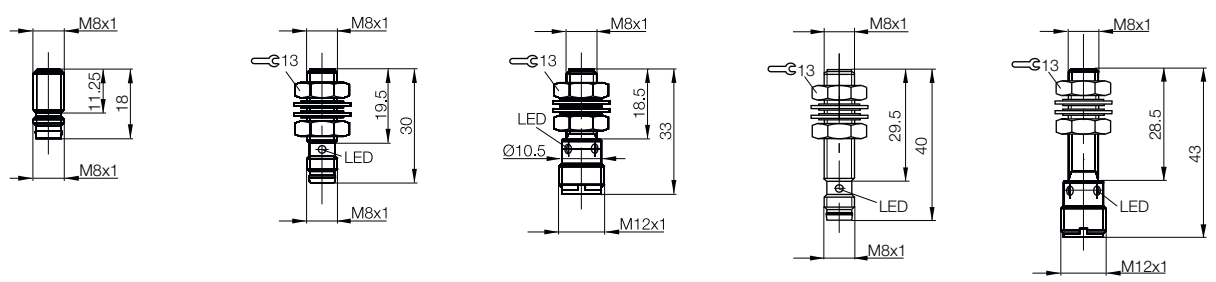


SUPERSHORTIES

M8x1	M8x1	M8x1	M8x1	M8x1
Flush	Flush	Flush	Flush	Flush
1.5 mm	1.5 mm	1.5 mm	1.5 mm	1.5 mm
0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm
■	■	■	■	■
BES0277	BES013N	BES013M	BES0147	BES0146
BES M08EA-PSD15B-S49G	BES M08EC-PSC15B-S49G	BES M08EC-PSC15B-S04G	BES M08EE-PSC15B-S49G	BES M08EE-PSC15B-S04G
BES0270	BES013K		BES0143	BES0142
BES M08EA-POD15B-S49G	BES M08EC-POC15B-S49G		BES M08EE-POC15B-S49G	BES M08EE-POC15B-S04G
BES026W	BES013J		BES013Z	BES013Y
BES M08EA-NSD15B-S49G	BES M08EC-NSC15B-S49G		BES M08EE-NSC15B-S49G	BES M08EE-NSC15B-S04G
BES026R			BES013T	BES013R
BES M08EA-NOD15B-S49G			BES M08EE-NOC15B-S49G	BES M08EE-NOC15B-S04G
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2.5 V	2.5 V	2.5 V	2.5 V	2.5 V
75 V DC	250 V AC (□)	250 V AC (□)	250 V AC (□)	250 V AC (□)
150 mA	200 mA	200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
3 kHz	3 kHz	3 kHz	3 kHz	3 kHz
No	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Short design				
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
PBT	PBT	PBT	PBT	PBT
M8 connector, 3-pin	M8 connector, 3-pin	M12 connector, 4-pin	M8 connector, 3-pin	M12 connector, 4-pin



- Inductive Sensors
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- DC 3-/4-wire
- Cylinder Designs
- Block Designs
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- Analog Distance measurement
- Accessories



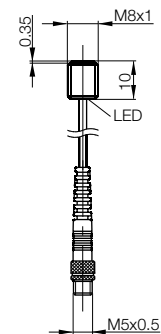
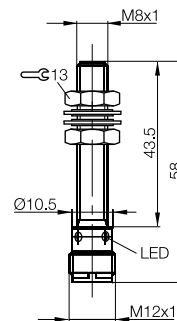
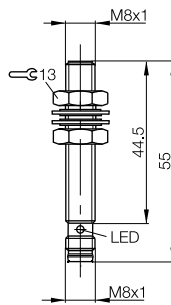


SUPERSHORTIES

Model		M8x1	M8x1	M8x1
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		1.5 mm	1.5 mm	1.5 mm
Assured switching distance s_a		0...1.2 mm	0...1.2 mm	0...1.2 mm
Switching distance marking		■	■	■
PNP, NO	Ordering code	BES01AW	BES01PF	BES0272
	Part number	BES 516-324-S49-C	BES M08EH-PSC15B-S04G	BES M08EA-PSC15B-EP00,3-GS26
PNP, NC	Ordering code	BES01LR	BES01PE	
	Part number	BES 516-377-S49-C	BES M08EH-POC15B-S04G	
NPN, NO	Ordering code	BES01F5	BES01PC	
	Part number	BES 516-343-S49-C	BES M08EH-NSC15B-S04G	
NPN, NC	Ordering code	BES01LZ	BES01PA	
	Part number	BES 516-378-S49-C	BES M08EH-NOC15B-S04G	
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_o max.		2.5 V	2.5 V	2.5 V
Rated insulation voltage U_i (protection class)		250 V AC (□)	250 V AC (□)	75 V DC
Rated operating current I_o		200 mA	200 mA	150 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		3 kHz	3 kHz	3 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 67
Approvals		CE, cULus	CE, cULus	CE, cULus
Special properties				Short design
Material	Housing	Stainless steel	Stainless steel	Stainless steel
	Sensing surface	PBT	PBT	PBT
Connection		M8 connector, 3-pin	M12 connector, 4-pin	0.3 m PUR cable with M5 connector, 4-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request

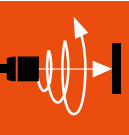




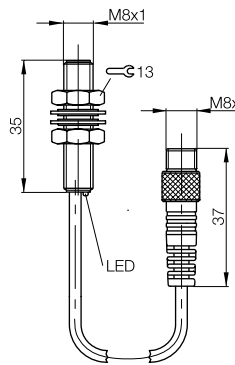
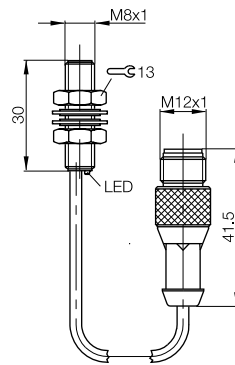
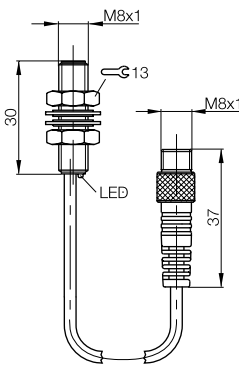
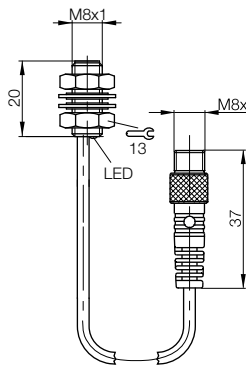
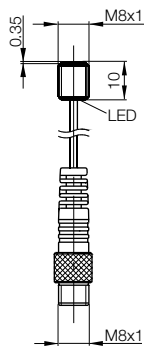
SUPERSHORTIES



M8x1	M8x1	M8x1	M8x1	M8x1
Flush	Flush	Flush	Flush	Flush
1.5 mm	1.5 mm	1.5 mm	1.5 mm	1.5 mm
0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm
■	■	■	■	■
BES0273	BES034Y	BES00NK	BES00N9	BES00MU
BES M08EA-PSC15B-EP00,3-GS49	BES 516-324-SA44-C-S49-00,3	BES 516-324-E4-C-S49-00,3	BES 516-324-E4-C-S4-00,3	BES 516-324-E3-C-S49-00,3
BES026T				
BES M08EA-NSC15B-EP00,3-GS49				
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2.5 V	2.5 V	2.5 V	2.5 V	2.5 V
75 V DC	75 V DC	250 V AC (□)	250 V AC (□)	250 V AC (□)
150 mA	200 mA	200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
3 kHz	4 kHz	3 kHz	3 kHz	3 kHz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
CE, cULus	CE	CE, cULus	CE, cULus	CE, cULus
Short design				
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
PBT	PBT	PBT	PBT	PBT
0.3 m PUR cable with M8 connector, 3-pin	0.3 m PUR cable with M8 connector, 3-pin	0.3 m PUR cable with M8 connector, 3-pin	0.3 m PUR cable with M12 connector, 4-pin	0.3 m PUR cable with M8 connector, 3-pin



Inductive Sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder Designs
Block Designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Special Properties
Analog Distance measurement
Accessories



DC 3-/4-wire Inductive Sensors

Cylinder designs, M8x1

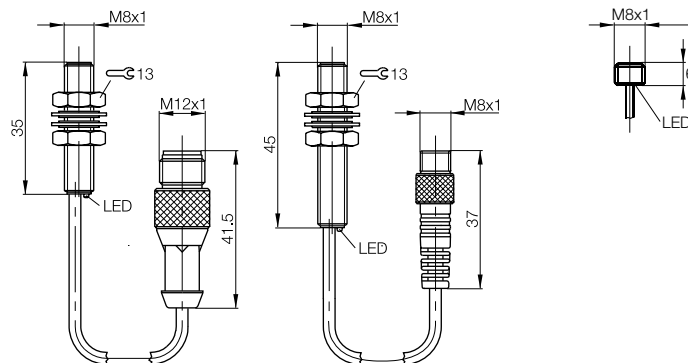


SUPERSHORTIES

Model		M8x1	M8x1	M8x1
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		1.5 mm	1.5 mm	1.5 mm
Assured switching distance s_a		0...1.2 mm	0...1.2 mm	0...1.2 mm
Switching distance marking		■	■	■
PNP, NO	Ordering code	BES00MT	BES01AL	BES026M
	Part number	BES 516-324-E3-C-S4-00,3	BES 516-324-EO-C-S49-00,3	BES M08E60-PSC15B-EP02
PNP, NC	Ordering code	BES010N	BES01LN	BES026K
	Part number	BES 516-377-E3-C-S4-PU-00,3	BES 516-377-EO-C-S49-00,3	BES M08E60-POC15B-EP02
NPN, NO	Ordering code		BES01F4	BES026J
	Part number		BES 516-343-EO-C-S49-00,3	BES M08E60-NSC15B-EP02
NPN, NC	Ordering code			BES026H
	Part number			BES M08E60-NOC15B-EP02
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_o max.		2.5 V	2.5 V	2.5 V
Rated insulation voltage U_i (protection class)		250 V AC (II)	250 V AC (II)	75 V DC
Rated operating current I_o		200 mA	200 mA	150 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		3 kHz	3 kHz	3 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 67
Approvals		CE, cULus	CE, cULus	CE, cULus
Special properties				Short design
Material	Housing	Stainless steel	Stainless steel	Stainless steel
	Sensing surface	PBT	PBT	PBT
Connection		0.3 m PUR cable with M12 connector, 4-pin	0.3 m PUR cable with M8 connector, 3-pin	2 m PUR cable, 3x0.073 mm ²

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

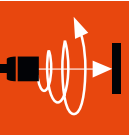
Additional cable lengths and PUR cable jacket material available on request



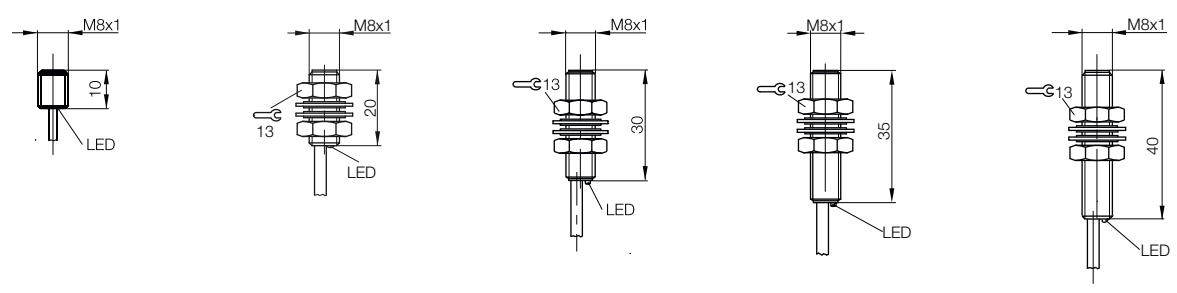


SUPERSHORTIES

M8x1	M8x1	M8x1	M8x1	M8x1
Flush	Flush	Flush	Flush	Flush
1.5 mm	1.5 mm	1.5 mm	1.5 mm	1.5 mm
0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm
■	■	■	■	■
BES0275	BES034P	BES00MY		BES014K
BES M08EA-PSC15B-EP02	BES 516-324-SA44-C-02	BES 516-324-E4-C-02		BES M08EF-PSC15B-BP02
BES026Y		BES010T	BES010K	BES014H
BES M08EA-POC15B-EP02		BES 516-377-E4-C-02	BES 516-377-E3-C-PU-02	BES M08EF-POC15B-BP02
BES026U		BES00TL		BES03J6
BES M08EA-NSC15B-EP02		BES 516-343-E4-C-02		BES M08EF-NSC15B-BP02
BES026N				BES014C
BES M08EA-NOC15B-EP02				BES M08EF-NOC15B-BP02
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2.5 V	2.5 V	2.5 V	2.5 V	2.5 V
75 V DC	75 V DC	250 V AC (□)	250 V AC (□)	250 V AC (□)
150 mA	200 mA	200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
3 kHz	4 kHz	3 kHz	3 kHz	3 kHz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
CE, cULus	CE	CE, cULus	CE, cULus	CE, cULus
Short design				
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
PBT	PBT	PBT	PBT	PBT
2 m PUR cable, 3x0.073 mm ²	2 m PVC cable, 3x0.14 mm ²	2 m PVC cable, 3x0.14 mm ²	2 m PUR cable, 3x0.14 mm ²	2 m PUR cable, 3x0.14 mm ²



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Block Designs
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AC/DC 2-wire
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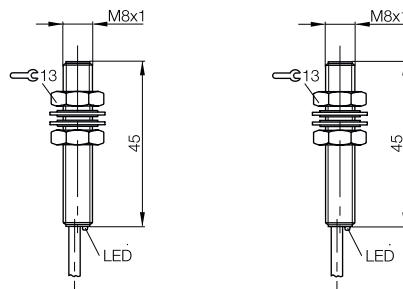




Model		M8x1	M8x1	
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	
Rated switching distance s_n		1.5 mm	1.5 mm	
Assured switching distance s_a		0...1.2 mm	0...1.2 mm	
Switching distance marking		■	■	
PNP, NO	Ordering code	BES01A7	BES01AC	
	Part number	BES 516-324-EO-C-02	BES 516-324-EO-C-PU-02	
PNP, NC	Ordering code	BES01LC	BES01LH	
	Part number	BES 516-377-EO-C-02	BES 516-377-EO-C-PU-02	
NPN, NO	Ordering code	BES01EY	BES01F1	
	Part number	BES 516-343-EO-C-02	BES 516-343-EO-C-PU-02	
NPN, NC	Ordering code	BES01LT		
	Part number	BES 516-378-EO-C-02		
Supply voltage U_s		10...30 V DC	10...30 V DC	
Voltage drop U_d at I_o max.		2.5 V	2.5 V	
Rated insulation voltage U_i (protection class)		250 V AC (□)	250 V AC (□)	
Rated operating current I_o		200 mA	200 mA	
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	
Switching frequency f max.		3 kHz	3 kHz	
Output function indicator		Yellow LED	Yellow LED	
Degree of protection as per IEC 60529		IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	
Approvals		CE, cULus	CE, cULus	
Special properties				
Material	Housing	Stainless steel	Stainless steel	
	Sensing surface	PBT	PBT	
Connection		2 m PVC cable, 3x0.14 mm ²	2 m PUR cable, 3x0.14 mm ²	

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

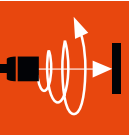
Additional cable lengths and PUR cable jacket material available on request



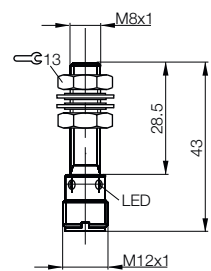
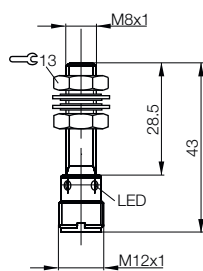
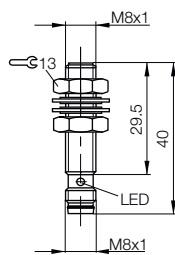
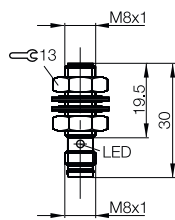
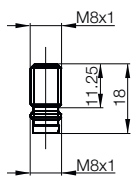


SUPERSHORTIES

M8x1	M8x1	M8x1	M8x1	M8x1
Flush	Flush	Flush	Flush	Flush
2 mm	2 mm	2 mm	2 mm	2 mm
0...1.6 mm	0...1.6 mm	0...1.6 mm	0...1.6 mm	0...1.4 mm
■ ■	■ ■	■ ■	■ ■	■ ■
BES0278	BES013P	BES014A	BES0148	BES0149
BES M08EA-PSD20B-S49G	BES M08EC-PSC20B-S49G	BES M08EE-PSC20B-S49G	BES M08EE-PSC20B-S04G	BES M08EE-PSC20B-S04G-101
	BES013L	BES0145	BES0144	
	BES M08EC-POC20B-S49G	BES M08EE-POC20B-S49G	BES M08EE-POC20B-S04G	
BES01P1		BES0141	BES0140	
BES M08EA-NSD20B-S49G		BES M08EE-NSC20B-S49G	BES M08EE-NSC20B-S04G	
		BES013W	BES013U	
		BES M08EE-NOC20B-S49G	BES M08EE-NOC20B-S04G	
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2.5 V	2.5 V	2.5 V	2.5 V	2.5 V
75 V DC	250 V AC (□)	250 V AC (□)	250 V AC (□)	250 V AC (□)
150 mA	200 mA	200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
3 kHz	1.5 kHz	1.5 kHz	1.5 kHz	1.5 kHz
No	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Short design				
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
PBT	PBT	PBT	PBT	With ceramic coating
M8 connector, 3-pin	M8 connector, 3-pin	M8 connector, 3-pin	M12 connector, 4-pin	M12 connector, 4-pin



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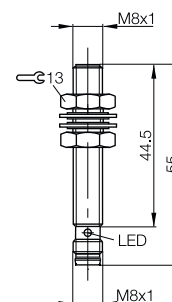
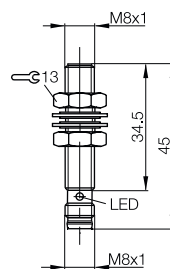
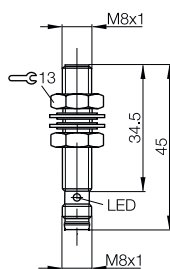




Model		M8x1	M8x1	M8x1	
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush	
Rated switching distance s_n		2 mm	2 mm	2 mm	
Assured switching distance s_a		0...1.6 mm	0...1.4 mm	0...1.6 mm	
Switching distance marking		■ ■	■ ■	■ ■	
PNP, NO	Ordering code	BES00P7	BES02P0	BES01AU	
	Part number	BES 516-324-G-E5-C-S49	BES 516-324-SA96-G-E5-C-S49	BES 516-324-G-S49-C	
PNP, NC	Ordering code	BES0113		BES01LP	
	Part number	BES 516-377-G-E5-C-S49		BES 516-377-G-S49-C	
NPN, NO	Ordering code	BES00TY	BES02P1		
	Part number	BES 516-343-G-E5-C-S49	BES 516-343-SA96-G-E5-C-S49		
NPN, NC	Ordering code	BES0118			
	Part number	BES 516-378-G-E5-C-S49			
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC	
Voltage drop U_d at I_e max.		2.5 V	2.5 V	2.5 V	
Rated insulation voltage U_i (protection class)		250 V AC (□)	250 V AC (□)	250 V AC (□)	
Rated operating current I_e		200 mA	200 mA	200 mA	
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C	
Switching frequency f max.		1.5 kHz	1.5 kHz	1.5 kHz	
Output function indicator		Yellow LED	Yellow LED	Yellow LED	
Degree of protection as per IEC 60529		IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	
Approvals		CE, cULus	CE, cULus	CE, cULus	
Special properties					
Material	Housing	Stainless steel	Stainless steel	Stainless steel	
	Sensing surface	PBT	With ceramic coating	PBT	
Connection		M8 connector, 3-pin	M8 connector, 3-pin	M8 connector, 3-pin	

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

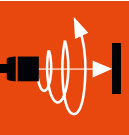
Additional cable lengths and PUR cable jacket material available on request





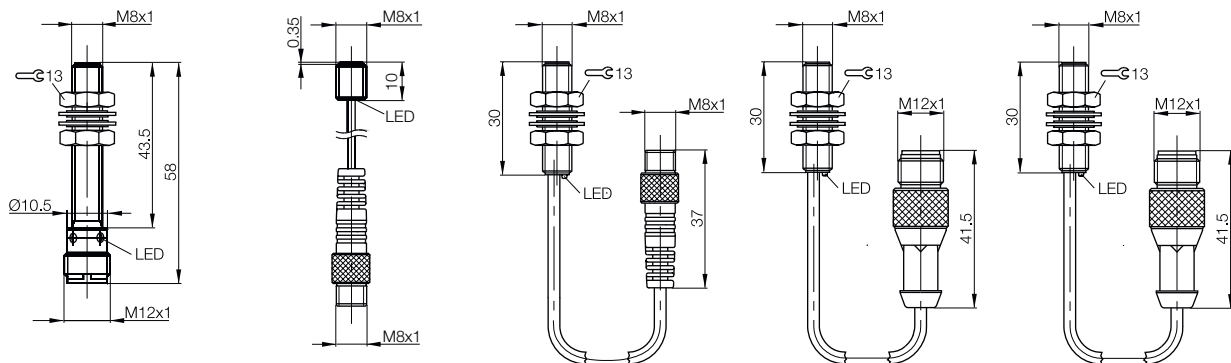
SUPERSHORTIES

M8x1	M8x1	M8x1	M8x1	M8x1
Flush	Flush	Flush	Flush	Flush
2 mm	2 mm	2 mm	2 mm	2 mm
0...1.6 mm	0...1.6 mm	0...1.6 mm	0...1.6 mm	0...1.4 mm
■ ■	■ ■	■ ■	■ ■	■ ■
BES01PH	BES0276	BES00P4	BES00P2	BES02P5
BES M08EH-PSC20B-S04G	BES M08EA-PSC20B-EP00,3-GS49	BES 516-324-G-E4-C-S49-00,3	BES 516-324-G-E4-C-S4-00,3	BES 516-324-SA96-G-E4-C-S4-00,3
		BES0112		
		BES 516-377-G-E4-C-S49-00,3		
BES0118				
BES 516-378-G-E5-C-S49				
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2.5 V	2.5 V	2.5 V	2.5 V	2.5 V
250 V AC (□)	75 V DC	250 V AC (□)	250 V AC (□)	250 V AC (□)
200 mA	150 mA	200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
1.5 kHz	3 kHz	1.5 kHz	1.5 kHz	1.5 kHz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 68 per BWN Pr. 20	IP 67	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
	Short design			
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
PBT	PBT	PBT	PBT	With ceramic coating
M12 connector, 4-pin	0.3 m PUR cable with M8 connector, 3-pin	0.3 m PUR cable with M8 connector, 3-pin	0.3 m PUR cable with M12 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin



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AC 2-wire
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DC 3-/4-wire Inductive Sensors

Cylinder designs, M8x1

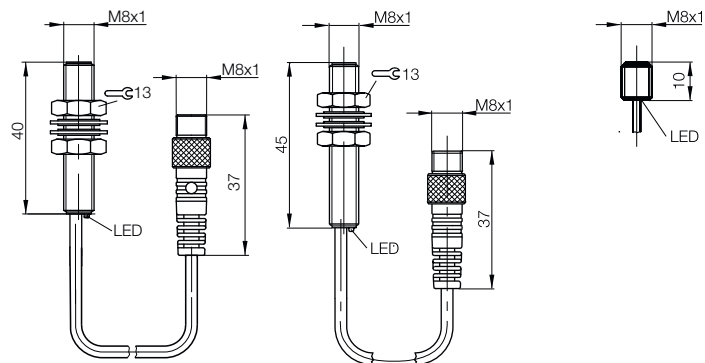


SUPERSHORTIES

		M8x1	M8x1	M8x1
Model		M8x1	M8x1	M8x1
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		2 mm	2 mm	2 mm
Assured switching distance s_a		0...1.6 mm	0...1.6 mm	0...1.6 mm
Switching distance marking		■ ■	■ ■	■ ■
PNP, NO	Ordering code	BES03TU	BES01AT	
	Part number	BES M08EF-PSC20B-BP00,3-GS49	BES 516-324-G-EO-C-S49-01	
PNP, NC	Ordering code			BES026Z
	Part number			BES M08EA-POC20B-EP02
NPN, NC	Ordering code			BES026P
	Part number			BES M08EA-NOC20B-EP02
NPN, NC	Ordering code			
	Part number			
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		2.5 V	2.5 V	2.5 V
Rated insulation voltage U_i (protection class)		250 V AC (II)	250 V AC (II)	75 V DC
Rated operating current I_e		200 mA	200 mA	150 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		1.5 kHz	1.5 kHz	3 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 67
Approvals		CE, cULus	CE, cULus	CE, cULus
Special properties				Short design
Material	Housing	Stainless steel	Stainless steel	Stainless steel
	Sensing surface	PBT	PBT	PBT
Connection		0.3 m PUR cable with M8 connector, 3-pin	1 m PUR cable with M8 connector, 3-pin	2 m PUR cable, 3x0.073 mm ²

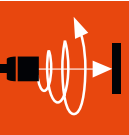
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request

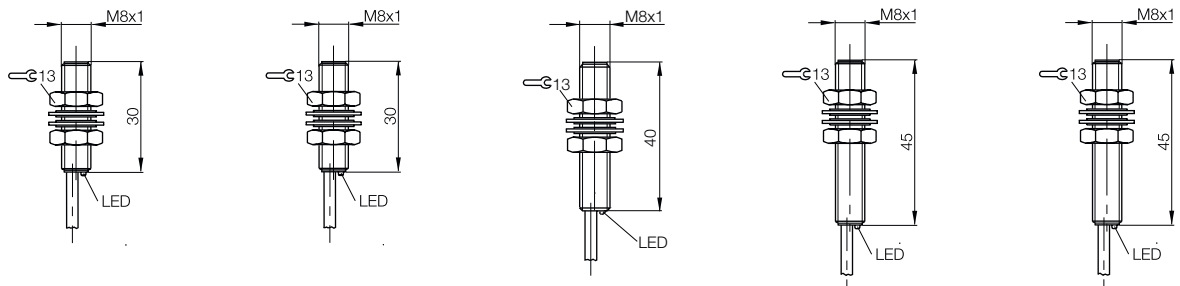




M8x1 Flush 2 mm 0...1.6 mm ■■	M8x1 Flush 2 mm 0...1.6 mm ■■	M8x1 Flush 2 mm 0...1.6 mm ■■	M8x1 Flush 2 mm 0...1.6 mm ■■	M8x1 Flush 2 mm 0...1.6 mm ■■
BES00NR BES 516-324-G-E4-C-02	BES00NY BES 516-324-G-E4-C-PU-02	BES014L BES M08EF-PSC20B-BP02	BES01AM BES 516-324-G-EO-C-02	BES01AN BES 516-324-G-EO-C-PU-02
BES010Y BES 516-377-G-E4-C-02	BES010Z BES 516-377-G-E4-C-PU-02	BES014J BES M08EF-POC20B-BP02		
BES00TT BES 516-343-G-E4-C-02		BES014F BES M08EF-NSC20B-BP02		
BES0116 BES 516-378-G-E4-C-02		BES014E BES M08EF-NOC20B-BP02		
10...30 V DC 2.5 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...+70 °C 1.5 kHz Yellow LED IP 68 per BWN Pr. 20 CE, cULus	10...30 V DC 2.5 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...+70 °C 1.5 kHz Yellow LED IP 68 per BWN Pr. 20 CE, cULus	10...30 V DC 2.5 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...+70 °C 1.5 kHz Yellow LED IP 68 per BWN Pr. 20 CE, cULus	10...30 V DC 2.5 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...+70 °C 1.5 kHz Yellow LED IP 68 per BWN Pr. 20 CE, cULus	10...30 V DC 2.5 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...+70 °C 1.5 kHz Yellow LED IP 68 per BWN Pr. 20 CE, cULus
Stainless steel PBT	Stainless steel PBT	Stainless steel PBT	Stainless steel PBT	Stainless steel PBT
2 m PVC cable, 3x0.14 mm ²	2 m PUR cable, 3x0.14 mm ²	2 m PUR cable, 3x0.14 mm ²	2 m PVC cable, 3x0.14 mm ²	2 m PUR cable, 3x0.14 mm ²



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TRIPLEPROX



TRIPLEPROX

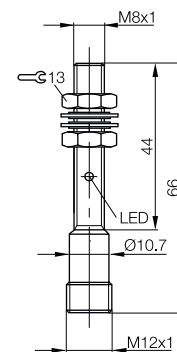
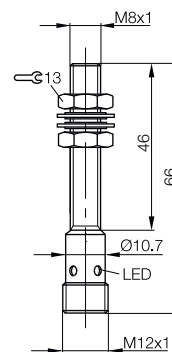
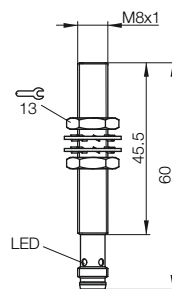


TRIPLEPROX

Model		M8x1	M8x1	M8x1
Installation type (observe instructions in the Basic Information chapter)		Quasi-flush	Quasi-flush	Quasi-flush
Rated switching distance s_n		3 mm	3 mm	3 mm
Assured switching distance s_a		0...2.4 mm	0...2.4 mm	0...2.2 mm
Switching distance marking		■■■	■■■	■■■
PNP, NO	Ordering code	BES02WA	BES02W9	BES02PW
	Part number	BES M08MH1-PSC30B-S49G	BES M08MH1-PSC30B-S04G	BES M08MH1-PSC30B-S04G-101
PNP, NC	Ordering code			
	Part number			
NPN, NO	Ordering code	BES02W8	BES02W7	
	Part number	BES M08MH1-NSC30B-S49G	BES M08MH1-NSC30B-S04G	
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		2 V	2 V	2 V
Rated insulation voltage U_i (protection class)		75 V DC	75 V DC	75 V DC
Rated operating current I_e		200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		1 kHz	1 kHz	1 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Approvals		CE	CE	CE
Special properties		Large switching distance	Large switching distance	Large switching distance
Material	Housing	Brass-coated	Brass-coated	Brass-coated
	Sensing surface	PBT	PBT	With ceramic coating
Connection		M8 connector, 3-pin	M12 connector, 4-pin	M12 connector, 4-pin

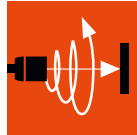
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request

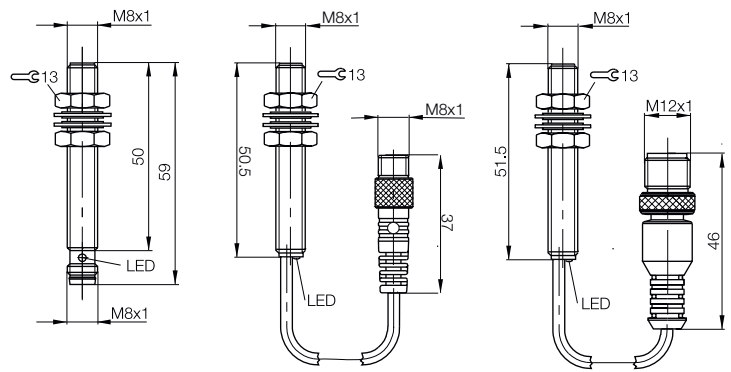




	HYPERPROX	HYPERPROX	HYPERPROX	
M8x1	M8x1	M8x1		
Quasi-flush	Quasi-flush	Quasi-flush		
4 mm	4 mm	4 mm		
0...2.9 mm	0...2.9 mm	0...2.9 mm		
■■■■	■■■■	■■■■		
BES01ZW	BES003R	BES01ZU		
BES M08MI-PSC40B-S49G	BES M08MI-PSC40B-BP00,3-GS49	BES M08MI-PSC40B-BP00,2-GS04		
BES01ZT		BES01ZR		
BES M08MI-NSC40B-S49G		BES M08MI-NSC40B-BP00,2-GS04		
10...30 V DC	10...30 V DC	10...30 V DC		
2.8 V	2.8 V	2.8 V		
75 V DC	75 V DC	75 V DC		
200 mA	200 mA	200 mA		
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes		
0...+60 °C	0...+60 °C	0...+60 °C		
800 Hz	800 Hz	800 Hz		
Yellow LED	Yellow LED	Yellow LED		
IP 67	IP 67	IP 67		
CE, cULus	CE, cULus	CE, cULus		
Large switching distance	Large switching distance	Large switching distance		
Brass-coated	Brass-coated	Brass-coated		
PBT	PBT	PBT		
M8 connector, 3-pin	0.3 m PUR cable with M8 connector, 3-pin	0.2 m PUR cable with M12 connector, 4-pin		



- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- Cylinder Designs
- Block Designs
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- Analog Distance measurement
- Accessories

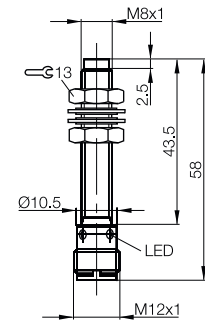
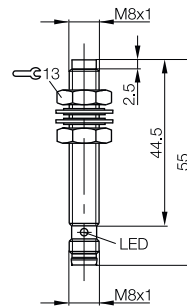
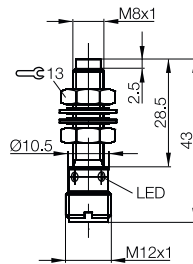




Model		M8x1	M8x1	M8x1
Installation type (observe instructions in the Basic Information chapter)		Not flush	Not flush	Not flush
Rated switching distance s_n		2.5 mm	2.5 mm	2.5 mm
Assured switching distance s_a		0...2 mm	0...2 mm	0...2 mm
Switching distance marking		■	■	■
PNP, NO	Ordering code	BES01P3	BES01M6	BES01P8
	Part number	BES M08ED-PSC25F-S04G	BES 516-383-S49-C	BES M08EG-PSC25F-S04G
PNP, NC	Ordering code			BES01P6
	Part number			BES M08EG-POC25F-S04G
NPN, NO	Ordering code	BES01P2		BES01P5
	Part number	BES M08ED-NSC25F-S04G		BES M08EG-NSC25F-S04G
NPN, NC	Ordering code			
	Part number			
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		2.5 V	2.5 V	2.5 V
Rated insulation voltage U_i (protection class)		250 V AC (□)	250 V AC (□)	250 V AC (□)
Rated operating current I_e		200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		2 kHz	2 kHz	2 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
Approvals		CE, cULus	CE, cULus	CE, cULus
Special properties				
Material	Housing	Stainless steel	Stainless steel	Stainless steel
	Sensing surface	PBT	PBT	PBT
Connection		M12 connector, 4-pin	M8 connector, 3-pin	M12 connector, 4-pin

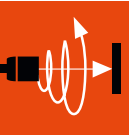
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request

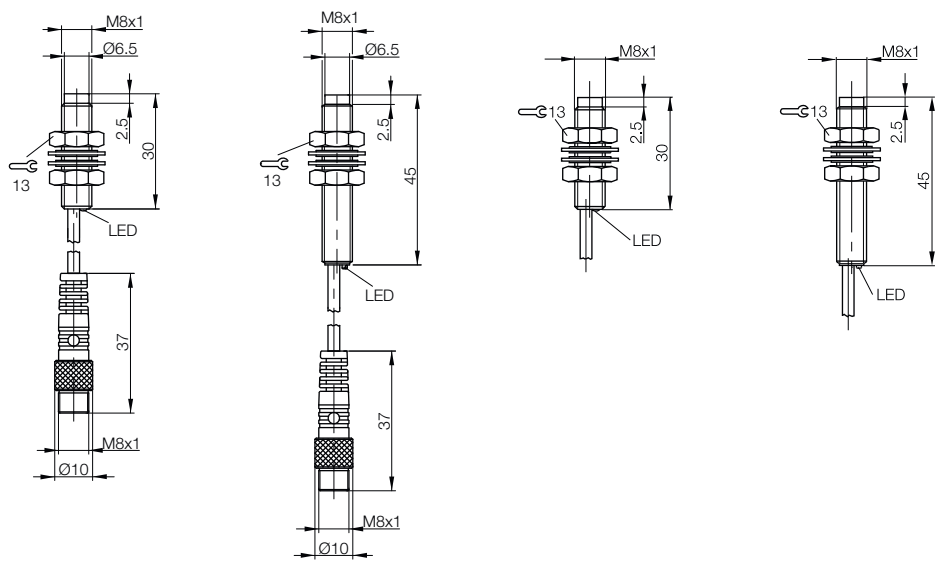




M8x1 Not flush 2.5 mm 0...2 mm ■	M8x1 Not flush 2.5 mm 0...2 mm ■	M8x1 Not flush 2.5 mm 0...2 mm ■	M8x1 Not flush 2.5 mm 0...2 mm ■	
		BES011A BES 516-383-E4-C-02	BES01M0 BES 516-383-EO-C-02	
BES011U BES 516-384-E4-C-S49-00.2	BES011A BES 516-384-EO-C-S49-00.2	BES011M BES 516-384-E4-C-02	BES01M7 BES 516-384-EO-C-02	
10...30 V DC 2.5 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...+70 °C 2 kHz Yellow LED IP 67 CE, cULus	10...30 V DC 2.5 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...+70 °C 2 kHz Yellow LED IP 67 CE, cULus	10...30 V DC 2.5 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...+70 °C 2 kHz Yellow LED IP 68 per BWN Pr. 20 CE, cULus	10...30 V DC 2.5 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...+70 °C 2 kHz Yellow LED IP 68 per BWN Pr. 20 CE, cULus	
Stainless steel PBT	Stainless steel PBT	Stainless steel PBT	Stainless steel PBT	
0.2 m PVC cable with M8 connector, 3-pin	0.2 m PVC cable with M8 connector, 3-pin	2 m PVC cable, 3x0.14 mm ²	2 m PVC cable, 3x0.14 mm ²	



Inductive Sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder Designs
Block Designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Special Properties
Analog Distance measurement
Accessories



DC 3-/4-wire Inductive Sensors

Cylinder designs, M8x1

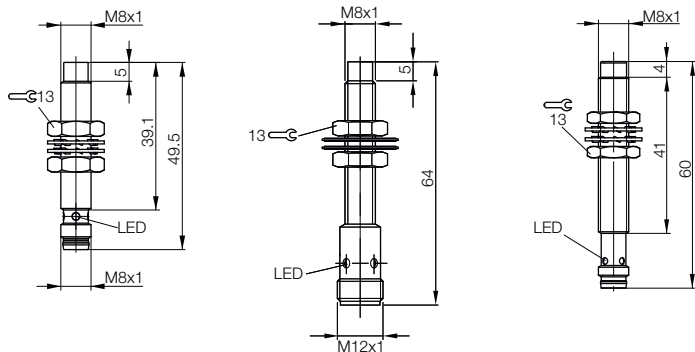


TRIPLEPROX

Model		M8x1	M8x1	M8x1	
Installation type (observe instructions in the Basic Information chapter)		Not flush	Not flush	Not flush	
Rated switching distance s_n		4 mm	4 mm	6 mm	
Assured switching distance s_a		0...3.2 mm	0...3.2 mm	0...4.8 mm	
Switching distance marking		■ ■	■ ■	■ ■ ■	
PNP, NO	Ordering code	BES014M	BES01P9	BES02W4	
	Part number	BES M08EF-PSC40F-S49G	BES M08EG1-PSC40F-S04G	BES M08MG1-PSC60F-S49G	
PNP, NC	Ordering code			BES02W2	
	Part number			BES M08MG1-POC60F-S49G	
NPN, NO	Ordering code				
	Part number				
NPN, NC	Ordering code			BES02UZ	
	Part number			BES M08MG1-NOC60F-S49G	
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC	
Voltage drop U_d at I_o max.		2.5 V	2.5 V	2 V	
Rated insulation voltage U_i (protection class)		250 V AC (□)	250 V AC (□)	75 V DC	
Rated operating current I_o		200 mA	200 mA	200 mA	
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C	
Switching frequency f max.		1.5 kHz	5 kHz	500 Hz	
Output function indicator		Yellow LED	Yellow LED	Yellow LED	
Degree of protection as per IEC 60529		IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 67	
Approvals		CE, cULus	CE, cULus	CE	
Special properties				Large switching distance	
Material	Housing	Stainless steel	Stainless steel	Brass-coated	
	Sensing surface	PBT	PBT	PBT	
Connection		M8 connector, 3-pin	M12 connector, 4-pin	M8 connector, 3-pin	

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request





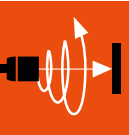
TRIPLEPROX



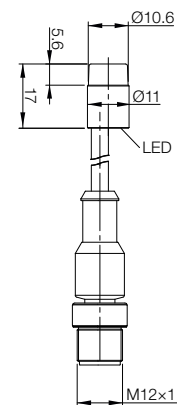
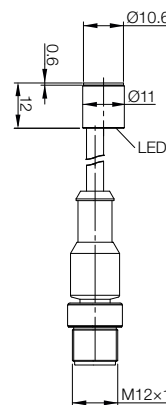
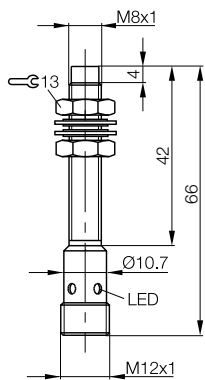
SUPERSHORTIES

SUPERSHORTIES

	M8x1			Ø11x12 mm	Ø11x17 mm
	Not flush			Flush	Not flush
	6 mm			4 mm	6 mm
	0...4.8 mm			0...3.2 mm	0...4.8 mm
	■■■			■■	■■
	BES02W3			BES047J	BES047R
	BES M08MG1-PSC60F-S04G			BES G11EA-PSC40B-EP00,3-GS04	BES G11EA-PSC60F-EP00,3-GS04
	BES02W0				
	BES M08MG1-NSC60F-S04G				
	10...30 V DC			10...30 V DC	10...30 V DC
	2 V			2.5 V	2.5 V
	75 V DC			75 V AC (□)	75 V AC (□)
	200 mA			100 mA	100 mA
	Yes/Yes/Yes			Yes/Yes/Yes	Yes/Yes/Yes
	-25...+70 °C			-40...+85 °C	-40...+85 °C
	500 Hz			2 kHz	2 kHz
	Yellow LED			Yellow LED	Yellow LED
	IP 67			IP 67	IP 67
	CE			CE, cULus	CE, cULus
	Large switching distance			Short design	Short design
	Brass-coated			Stainless steel	Stainless steel
	PBT			LCP	LCP
	M12 connector, 4-pin			M12 connector, 4-pin	M12 connector, 4-pin



Inductive Sensors
Global DC 3-wire
DC 3-/4-wire
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Block Designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Special Properties
Analog Distance measurement
Accessories

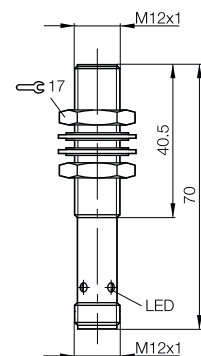
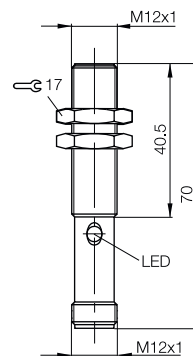
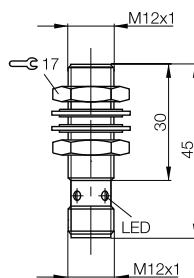


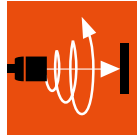


Model		M12x1	M12x1	M12x1	
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush	
Rated switching distance s_n		2 mm	2 mm	2 mm	
Assured switching distance s_a		0...1.6 mm	0...1.6 mm	0...1.6 mm	
Switching distance marking		■	■	■	
PNP, NO	Ordering code	BES00PK	BES02EL	BES01C8	
	Part number	BES 516-325-E5-C-S4	BES 515-325-S4-C	BES 516-325-S4-C	
PNP, NC	Ordering code	BES00YT	BES01K6		
	Part number	BES 516-370-E5-C-S4	BES 516-370-S4-C		
PNP, complementary	Ordering code			BES0161	
	Part number			BES 516-113-S4-C	
NPN, NO	Ordering code	BES00T5	BES01EN		
	Part number	BES 516-329-E5-C-S4	BES 516-329-S4-C		
NPN, NC	Ordering code	BES010A	BES01LA		
	Part number	BES 516-375-E5-C-S4	BES 516-375-S4-C		
NPN, complementary	Ordering code			BES016E	
	Part number			BES 516-118-S4-C	
Supply voltage U_S		10...30 V DC	10...30 V DC	10...30 V DC	
Voltage drop U_d at I_e max.		2 V	1.5 V	1.5 V	
Rated insulation voltage U_i (protection class)		250 V AC (□)	250 V AC (□)	250 V AC (□)	
Rated operating current I_e		200 mA	200 mA	200 mA	
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-40...+85 °C	
Switching frequency f max.		5 kHz	3 kHz	2.5 kHz	
Output function indicator		Yellow LED	Yellow LED	Yellow LED	
Degree of protection as per IEC 60529		IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	
Approvals		CE, cULus	CE, cULus	CE, cULus	
Material	Housing	Brass-coated	Stainless steel	Stainless steel	
	Sensing surface	PBT	PA 12	PA 12	
Connection		M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request





Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

Cylinder Designs

Block Designs

DC 2-wire

AC/DC 2-wire

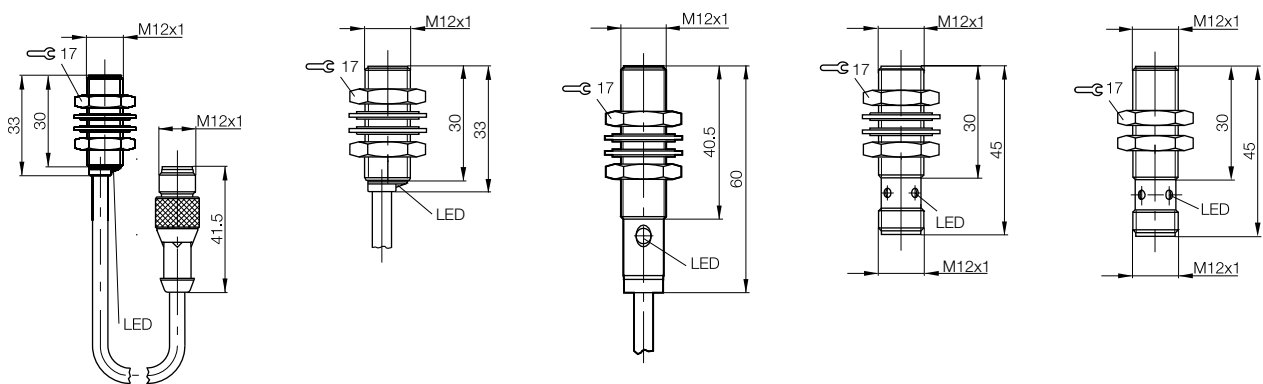
AC 2-wire

Special Properties

Analog Distance measurement

Accessories

M12x1 Flush 2 mm 0...1.6 mm ■	M12x1 Flush 2 mm 0...1.6 mm ■	M12x1 Flush 2 mm 0...1.6 mm ■	M12x1 Flush 4 mm 0...3.2 mm ■ ■	M12x1 Flush 4 mm 0...3.2 mm ■ ■
BES00PH BES 516-325-E4-C-S4-00,5	BES00P8 BES 516-325-E4-C-02	BES01AZ BES 516-325-BO-C-02	BES00PY BES 516-325-G-E5-C-S4	BES014W BES M12EE-PSC40B-S04G
	BES00YL BES 516-370-E4-C-02	BES01K2 BES 516-370-BO-C-02	BES00Z0 BES 516-370-G-E5-C-S4	BES014U BES M12EE-POC40B-S04G
	BES00T0 BES 516-329-E4-C-02	BES01EF BES 516-329-BO-C-02	BES00TC BES 516-329-G-E5-C-S4	
	BES0108 BES 516-375-E4-C-02	BES01L7 BES 516-375-BO-C-02	BES010H BES 516-375-G-E5-C-S4	
10...30 V DC 2 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...+70 °C 5 kHz Yellow LED IP 68 per BWN Pr. 20 CE, cULus Brass-coated PBT 0.5 m PUR cable with M12 connector, 4-pin	10...30 V DC 2 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...+70 °C 5 kHz Yellow LED IP 68 per BWN Pr. 20 CE, cULus Brass-coated PBT 2 m PVC cable, 3x0.34 mm ²	10...30 V DC 1.5 V 250 V AC (□) 200 mA Yes/Yes/Yes -40...+85 °C 3 kHz Yellow LED IP 68 per BWN Pr. 20 CE, cULus Stainless steel PA 12 2 m PVC cable, 3x0.34 mm ²	10...30 V DC 2.5 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...+70 °C 2.5 kHz Yellow LED IP 68 per BWN Pr. 20 CE, cULus Brass-coated LCP M12 connector, 4-pin	10...30 V DC 2 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...+85 °C 2 kHz Yellow LED IP 68 per BWN Pr. 20 CE, cULus Stainless steel LCP M12 connector, 4-pin



DC 3-/4-wire Inductive Sensors

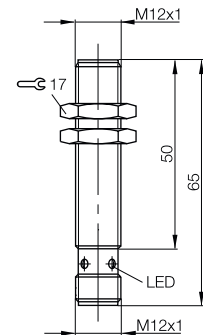
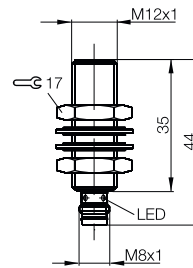
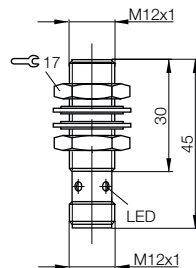
Cylinder designs, M12x1



Model		M12x1	M12x1	M12x1
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		4 mm	4 mm	4 mm
Assured switching distance s_a		0...3 mm	0...3.2 mm	0...3.2 mm
Switching distance marking		■ ■	■ ■	■ ■
PNP, NO	Ordering code		BES00PZ	BES02FU
	Part number		BES 516-325-G-E5-C-S49	BES M12EI-PSC40B-S04G
PNP, NC	Ordering code		BES00Z1	BES02FT
	Part number		BES 516-370-G-E5-C-S49	BES M12EI-POC40B-S04G
NPN, NO	Ordering code	BES03UP	BES00TE	BES02FR
	Part number	BES 516-329-SA96-G-E5-C-S4	BES 516-329-G-E5-C-S49	BES M12EI-NSC40B-S04G
NPN, NC	Ordering code		BES010J	
	Part number		BES 516-375-G-E5-C-S49	
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		2.5 V	2.5 V	2.5 V
Rated insulation voltage U_i (protection class)		250 V AC (□)	75 V DC	250 V AC (□)
Rated operating current I_e		200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+85 °C
Switching frequency f max.		2.5 kHz	2.5 kHz	1 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 68 per BWN Pr. 20	IP 67	IP 68 per BWN Pr. 20
Approvals		CE, cULus	CE, cULus	CE, cULus
Special properties				
Material	Housing	Brass-coated	Brass-coated	Stainless steel
	Sensing surface	With ceramic coating	LCP	LCP
Connection		M12 connector, 4-pin	M8 connector, 3-pin	M12 connector, 4-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

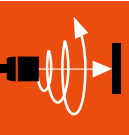
Additional cable lengths and PUR cable jacket material available on request



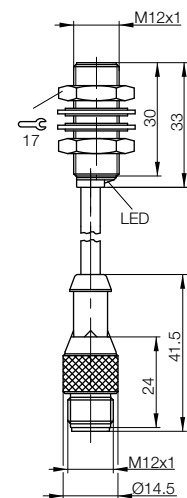
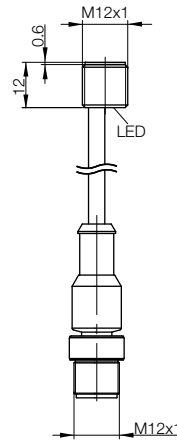
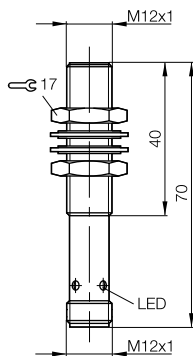
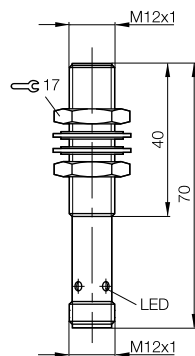
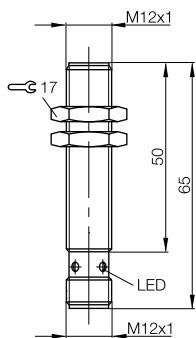


SUPERSHORTIES

M12x1	M12x1	M12x1	M12x1	M12x1
Flush	Flush	Flush	Flush	Flush
4 mm	4 mm	4 mm	4 mm	4 mm
0...3.2 mm	0...3.2 mm	0...3 mm	0...3.2 mm	0...3.2 mm
■ ■	■ ■	■ ■	■ ■	■ ■
BES038C	BES01C7	BES035R	BES0464	BES00PW
BES M12EI-PSC40B-S04G-009	BES 516-325-G-S4-C	BES 516-325-SA96-G-S4-C	BES M12EA-PSC40B-EP00,3-GS04	BES 516-325-G-E4-C-S4-00,5
			BES0465	
			BES M12EA-POC40B-EP00,3-GS04	
			BES0467	BES03EK
			BES M12EA-NSC40B-EP00,3-GS04	BES 516-329-G-E4-C-S4-PU-00,5
			BES0466	
			BES M12EA-NOC40B-EP00,3-GS04	
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2.5 V	2.5 V	2.5 V	1.7 V	2.5 V
250 V AC (□)	250 V AC (□)	250 V AC (□)	75 V DC	250 V AC (□)
200 mA	200 mA	200 mA	100 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-40...+85 °C	-25...+70 °C	-25...+70 °C	-40...+85 °C	-25...+70 °C
2 kHz	1 kHz	1 kHz	1 kHz	2.5 kHz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 67	IP 68 per BWN Pr. 20
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
			Short design	
Stainless steel	Brass-coated	Brass-coated	Stainless steel	Brass-coated
LCP	LCP	With ceramic coating	LCP	LCP
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin	0.5 m PUR cable with M12 connector, 4-pin



- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
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- Block Designs
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- Analog Distance Measurement
- Accessories



DC 3-/4-wire Inductive Sensors

Cylinder designs, M12x1

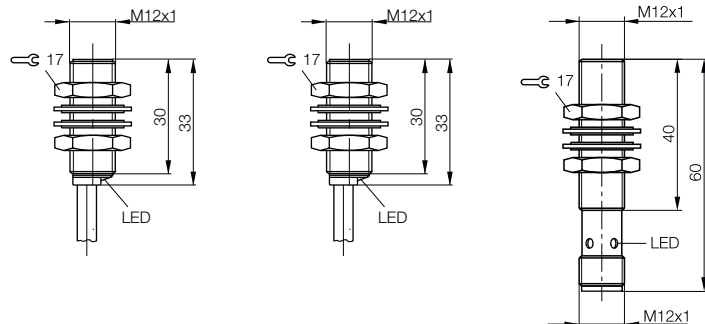


TRIPLEPROX

Model		M12x1	M12x1	M12x1	
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Quasi-flush	
Rated switching distance s_n		4 mm	4 mm	6 mm	
Assured switching distance s_a		0...3.2 mm	0...3.2 mm	0...4.8 mm	
Switching distance marking		■ ■	■ ■	■ ■ ■	
PNP, NO	Ordering code	BES00PL	BES00PP	BES02WZ	
	Part number	BES 516-325-G-E4-C-02	BES 516-325-G-E4-C-PU-02	BES M12MG1-PSC60B-S04G	
PNP, NC	Ordering code	BES00YU	BES00YW	BES02WY	
	Part number	BES 516-370-G-E4-C-02	BES 516-370-G-E4-C-PU-02	BES M12MG1-POC60B-S04G	
PNP, complementary	Ordering code				
	Part number				
NPN, NO	Ordering code	BES00T6	BES00T9	BES02WW	
	Part number	BES 516-329-G-E4-C-02	BES 516-329-G-E4-C-PU-02	BES M12MG1-NSC60B-S04G	
NPN, NC	Ordering code	BES010C	BES010E	BES02WU	
	Part number	BES 516-375-G-E4-C-02	BES 516-375-G-E4-C-PU-02	BES M12MG1-NOC60B-S04G	
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC	
Voltage drop U_d at I_o max.		2.5 V	2.5 V	2 V	
Rated insulation voltage U_i (protection class)		250 V AC (□)	250 V AC (□)	75 V DC	
Rated operating current I_o		200 mA	200 mA	200 mA	
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C	
Switching frequency f max.		2.5 kHz	2.5 kHz	800 Hz	
Output function indicator		Yellow LED	Yellow LED	Yellow LED	
Degree of protection as per IEC 60529		IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 67	
Approvals		CE, cULus	CE, cULus	CE	
Special properties				Large switching distance	
Material	Housing	Brass-coated	Brass-coated	Brass-coated	
	Sensing surface	LCP	LCP	PBT	
Connection		2 m PVC cable, 3x0.34 mm ²	2 m PUR cable, 3x0.34 mm ²	M12 connector, 4-pin	

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request

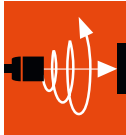




HYPERPROX



M12x1	M12x1	M12x1	M12x1	M12x1
Quasi-flush	Not flush	Not flush	Not flush	Not flush
8 mm	4 mm	4 mm	4 mm	4 mm
0...5.8 mm	0...3.2 mm	0...3.2 mm	0...3.2 mm	0...3.2 mm
■■■■	■	■	■	■
BES01ZN	BES00UY		BES02FC	BES01H6
BES M12MI-PSH80B-S04G	BES 516-356-E5-C-S4		BES 515-356-S4-C	BES 516-356-S4-C
	BES00KM		BES018Y	
	BES 516-3019-E5-C-S4		BES 516-3019-S4-C	
				BES0178
				BES 516-131-S4-C
BES01ZY		BES030Z	BES01HE	
BES M12MI-NSH80B-S04G		BES 516-357-E5-Y-S4	BES 516-357-S4-C	
			BES019E	
			BES 516-3030-S4-C	
10...55 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2.5 V	2 V	3.5 V	1.5 V	1.5 V
250 V AC (□)	250 V AC (□)	75 V DC	250 AC (□)	250 V AC (□)
200 mA	200 mA	130 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
0...+60 °C	-25...+70 °C	-25...+70 °C	-40...+85 °C	-40...+85 °C
300 Hz	2 kHz	400 Hz	1.5 kHz	1.5 kHz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
CE	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Large switching distance				
Brass-coated	Brass-coated	Brass-coated	Stainless steel	Stainless steel
LCP	PBT	PA 12	PA 12	PA 12
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

Cylinder Designs

Block Designs

DC 2-wire

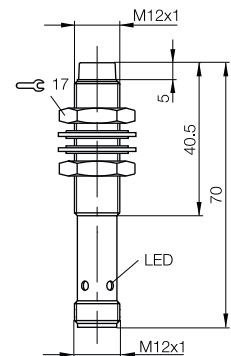
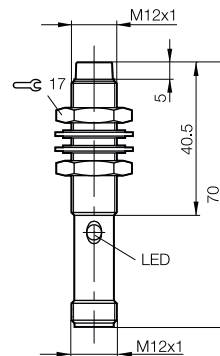
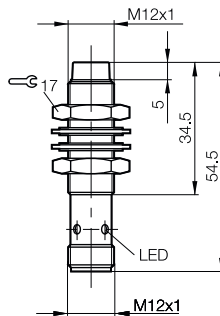
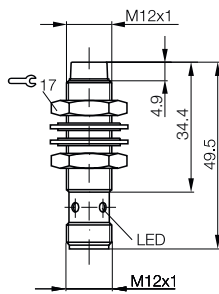
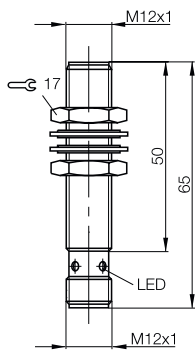
AC/DC 2-wire

AC 2-wire

Special Properties

Analog Distance Measurement

Accessories



DC 3-/4-wire Inductive Sensors

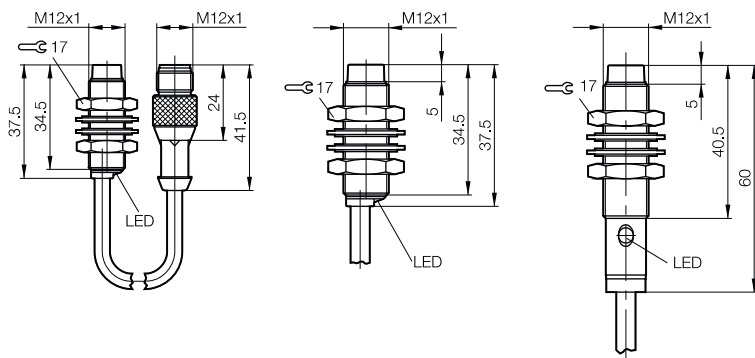
Cylinder designs, M12x1



Model		M12x1	M12x1	M12x1
Installation type (observe instructions in the Basic Information chapter)		Not flush	Not flush	Not flush
Rated switching distance s_n		4 mm	4 mm	4 mm
Assured switching distance s_a		0...3.2 mm	0...3.2 mm	0...3.2 mm
Switching distance marking		■	■	■
PNP, NO	Ordering code	BES00UT	BES00UL	BES01H1
	Part number	BES 516-356-E4-C-S4-00,3	BES 516-356-E4-C-02	BES 516-356-BO-C-02
PNP, NC	Ordering code			BES018P
	Part number			BES 516-3019-BO-C-02
NPN, NO	Ordering code		BES00W0	BES01H7
	Part number		BES 516-357-E4-C-02	BES 516-357-BO-C-02
NPN, NC	Ordering code		BES00M0	BES019A
	Part number		BES 516-3030-E4-C-02	BES 516-3030-BO-C-02
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_o max.		2 V	2 V	1.5 V
Rated insulation voltage U_i (protection class)		250 V AC (□)	250 V AC (□)	250 V AC (□)
Rated operating current I_o		200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-40...+85 °C
Switching frequency f max.		2 kHz	2 kHz	1.2 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
Approvals		CE, cULus	CE, cULus	CE, cULus
Special properties				
Material	Housing	Brass-coated	Brass-coated	Stainless steel
	Sensing surface	PBT	PBT	PA 12
Connection		0.3 m PUR cable with M12 connector, 4-pin	2 m PVC cable, 3x0.34 mm ²	2 m PVC cable, 3x0.34 mm ²

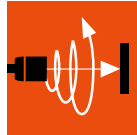
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request

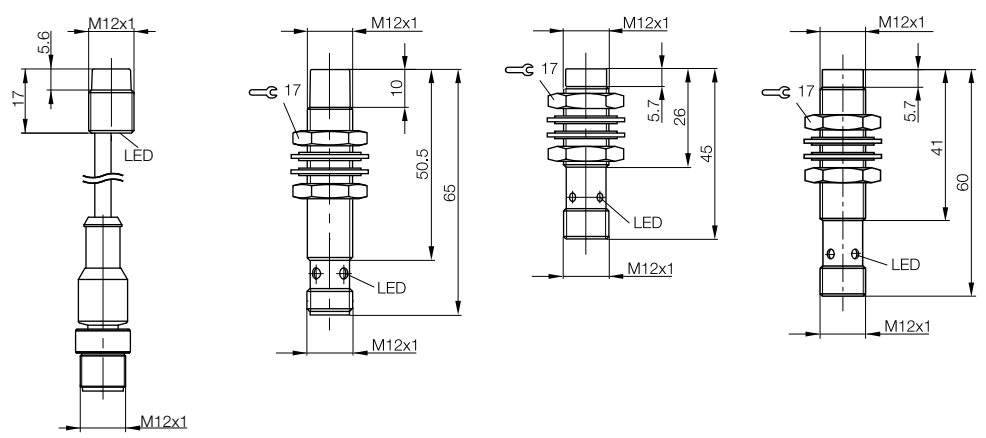




SUPERSHORTIES		TRIPLEPROX	
M12x1 Not flush 6 mm 0...4.8 mm ■ ■	M12x1 Not flush 8 mm 0...6.4 mm ■ ■	M12x1 Not flush 10 mm 0...8 mm ■ ■ ■	M12x1 Not flush 10 mm 0...8 mm ■ ■ ■
BES047L BES M12EA-PSC60F-EP00,3-GS04	BES01PN BES M12EG-PSC80F-S04G	BES02WK BES M12MC1-PSC10F-S04G	BES02WR BES M12MF1-PSC10F-S04G
BES047M BES M12EA-POC60F-EP00,3-GS04			BES02WP BES M12MF1-POC10F-S04G
BES047P BES M12EA-NSC60F-EP00,3-GS04		BES02WJ BES M12MC1-NSC10F-S04G	BES02WN BES M12MF1-NSC10F-S04G
BES047N BES M12EA-NOC60F-EP00,3-GS04			
10...30 V DC 2.5 V 75 V DC 100 mA Yes/Yes/Yes -40...+85 °C 1 kHz Yellow LED IP 67 CE, cULus Short design Stainless steel LCP 0.3 m PUR cable with M12 connector, 4-pin	10...30 V DC 2.5 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...+70 °C 1.5 kHz Yellow LED IP 68 per BWN Pr. 20 CE, cULus	10...30 V DC 2 V 75 V DC 200 mA Yes/Yes/Yes -25...+70 °C 400 Hz Yellow LED IP 67 CE Large switching distance Brass-coated PBT M12 connector, 4-pin	10...30 V DC 2 V 75 V DC 200 mA Yes/Yes/Yes -25...+70 °C 400 Hz Yellow LED IP 67 CE Large switching distance Brass-coated PBT M12 connector, 4-pin



- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- Cylinder Designs
- Block Designs
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- Analog Distance Measurement
- Accessories



DC 3-/4-wire Inductive Sensors

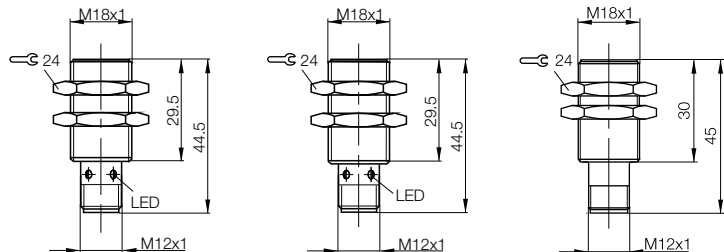
Cylinder designs, M18x1



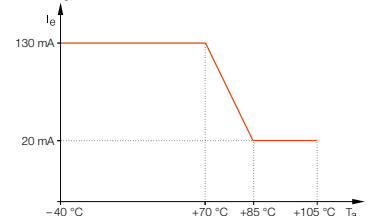
Model		M18x1	M18x1	M18x1	
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush	
Rated switching distance s_n		5 mm	5 mm	5 mm	
Assured switching distance s_a		0...4 mm	0...4 mm	0...4 mm	
Switching distance marking		■	■	■	
PNP, NO	Ordering code	BES00R6		BES02ET	
	Part number	BES 516-326-E5-C-S4		BES 515-326-E5-T-S4	
PNP, NC	Ordering code		BES00YC		
	Part number		BES 516-367-E5-Y-S4		
PNP, complementary	Ordering code				
	Part number				
NPN, NO	Ordering code		BES00UC		
	Part number		BES 516-355-E5-Y-S4		
NPN, NC	Ordering code				
	Part number				
NPN, complementary	Ordering code				
	Part number				
Supply voltage U_S		10...30 V DC	10...30 V DC	10...30 V DC	
Voltage drop U_d at I_e max.		2 V	3.5 V	3.5 V	
Rated insulation voltage U_i (protection class)		75 V DC	75 V DC	75 V DC	
Rated operating current I_e		200 mA	130 mA	130 mA	
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-40...+105 °C*	
Switching frequency f max.		1 kHz	500 Hz	500 Hz	
Output function indicator		Yellow LED	Yellow LED	No	
Degree of protection as per IEC 60529		IP 67	IP 67	IP 69K, IP 68 as per BWN Pr. 27	
Approvals		CE, cULus	CE, cULus	CE, cULus	
Special properties				Resistant to high-pressure cleaners	
Material	Housing	Brass-coated	Brass-coated	Stainless steel	
	Sensing surface	PBT	PA 12	PA 12	
Connection		M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	

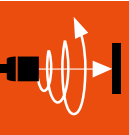
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request



***max. load current over temperature**





Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

Cylinder Designs

Block Designs

DC 2-wire

AC/DC 2-wire

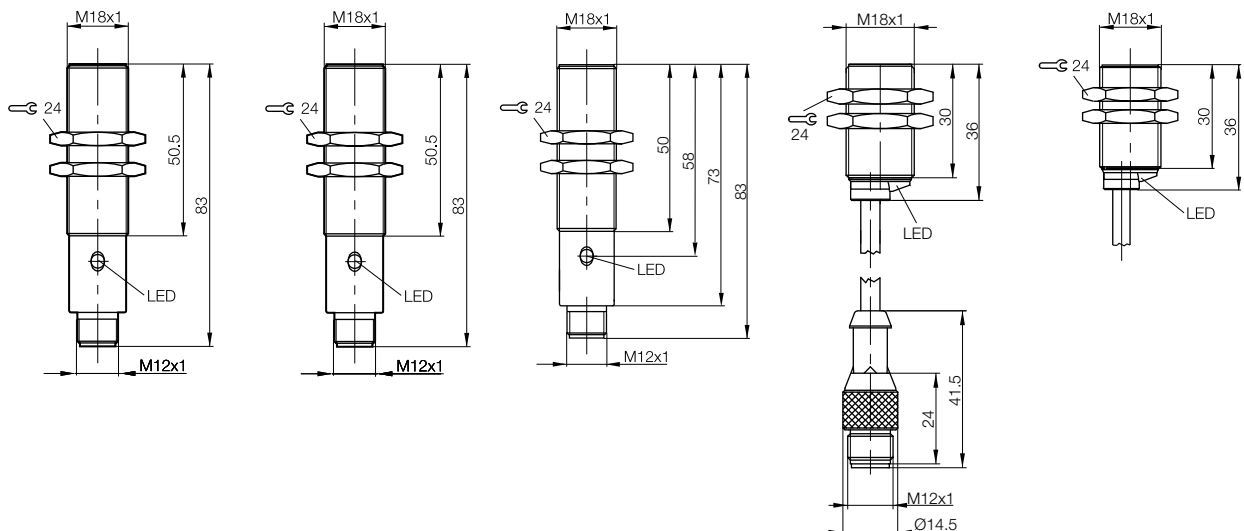
AC 2-wire

Special Properties

Analog Distance Measurement

Accessories

M18x1	M18x1	M18x1	M18x1	M18x1
Flush	Flush	Flush	Flush	Flush
5 mm	5 mm	5 mm	5 mm	5 mm
0...4 mm	0...4 mm	0...4 mm	0...4 mm	0...4 mm
■	■	■	■	■
BES01CW	BES01CZ	BES02EU	BES00R5	BES00R0
BES 516-326-S4-C	BES 516-326-S4-H	BES 515-326-S4-C	BES 516-326-E4-C-S4-00,2	BES 516-326-E4-C-02
BES01JW				
BES 516-367-S4-C				
BES015N				
BES 516-105-S4-C				
BES01H0				
BES 516-355-S4-C				
BES01JU				
BES 516-366-S4-C				
BES015U				
BES 516-111-S4-C				
10...30 V DC	10...55 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2.5 V	1.5 V	1.5 V	2 V	2 V
250 V AC (□)	250 V AC (□)	250 V AC (□)	75 V DC	75 V DC
200 mA	200 mA	200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-40...+85 °C	-25...+70 °C	-25...+70 °C
900 Hz	900 Hz	900 Hz	1 kHz	1 kHz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 67	IP 67
CE, cULus	CE	CE, cULus	CE, cULus	CE, cULus
Brass-coated	Brass-coated	Stainless steel	Brass-coated	Brass-coated
PA 12	PA 12	PA 12	PA 12	PBT
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	0.2 m PUR cable with M12 connector, 4-pin	2 m PVC cable, 3x0.34 mm ²



DC 3-/4-wire Inductive Sensors

Cylinder designs, M18x1

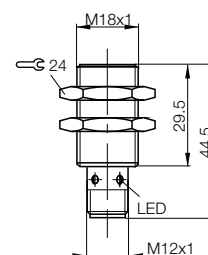
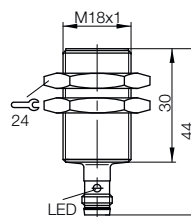
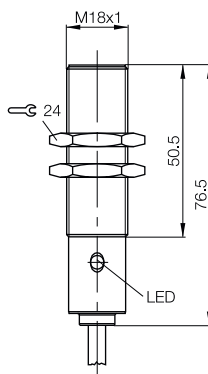


Model		M18x1	M18x1	M18x1
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		5 mm	8 mm	8 mm
Assured switching distance s_a		0...4 mm	0...6.4 mm	0...6.4 mm
Switching distance marking		■	■■	■■■
PNP, NO	Ordering code	BES01CE	BES030R	BES00RC
	Part number	BES 516-326-BO-C-02	BES 516-326-G-E5-Y-S49	BES 516-326-G-E5-C-S4
PNP, NC	Ordering code		BES00YK	BES00YJ
	Part number		BES 516-367-G-E5-Y-S49	BES 516-367-G-E5-Y-S4
PNP, complementary	Ordering code			
	Part number			
NPN, NO	Ordering code	BES01JP	BES00UK	BES00UJ
	Part number	BES 516-366-BO-C-02	BES 516-355-G-E5-Y-S49	BES 516-355-G-E5-Y-S4
NPN, NC	Ordering code			
	Part number			
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_o max.		2.5 V	3.5 V	3.5 V
Rated insulation voltage U_i (protection class)		250 V AC (II)	75 V DC	75 V DC
Rated operating current I_o		200 mA	130 mA	130 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		500 Hz	200 Hz	200 Hz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 68 per BWN Pr. 20	IP 67	IP 67
Approvals		CE, cULus	CE, cULus	CE, cULus
Material	Housing	Brass-coated	Brass-coated	Brass-coated
	Sensing surface	PA 12	PBT	PBT
Connection		2 m PVC cable, 3x0.34 mm ²	M8 connector, 3-pin	M12 connector, 4-pin

Wiring diagrams, see page 958.

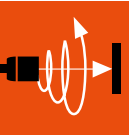
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request

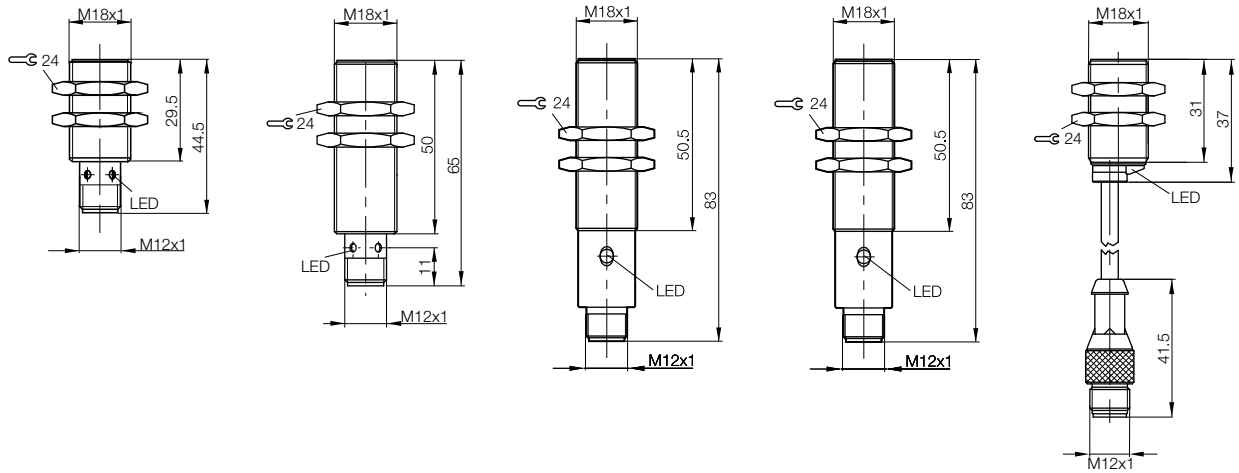




M18x1	M18x1	M18x1	M18x1	M18x1
Flush	Flush	Flush	Flush	Flush
8 mm	8 mm	8 mm	8 mm	8 mm
0...6.3 mm	0...6.4 mm	0...6.4 mm	0...6.4 mm	0...6.4 mm
■ ■	■ ■	■ ■	■ ■	■ ■
BES02P3	BES02H0	BES01CT	BES01CU	BES00RA
BES 516-326-SA96-G-E5-Y-S4	BES M18EI-PSC80B-S04G	BES 516-326-G-S4-C	BES 516-326-G-S4-H	BES 516-326-G-E4-C-S4-00,3
	BES02FZ			
	BES M18EI-POC80B-S04G			
			BES015M	
			BES 516-105-G-S4-H	
BES02P4	BES02FY			
BES 516-355-SA96-G-E5-Y-S4	BES M18EI-NSC80B-S04G			
	BES02FW			
	BES M18EI-NOC80B-S04G			
10...30 V DC	10...30 V DC	10...30 V DC	10...55 V DC	10...30 V DC
3.5 V	2.5 V	2.5 V	2.5 V	2.5 V
75 V DC	250 V AC (□)	75 V DC (□)	75 V DC	75 V DC
130 mA	200 mA	200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-40...+85 °C	0...70 °C	0...+70 °C	-25...+70 °C
200 Hz	700 Hz	80 Hz	80 Hz	500 Hz
Yellow LED	Yellow LED	Yes	Yellow LED	Yellow LED
IP 67	IP 68 per BWN Pr. 20	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE	CE, cULus
Brass-coated	Stainless steel	Brass-coated	Brass-coated	Brass-coated
With ceramic coating	PBT	PBT	PBT	PBT
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin



Inductive Sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder Designs
Block Designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Special Properties
Analog Distance Measurement
Accessories



DC 3-/4-wire Inductive Sensors Cylinder designs, M18x1



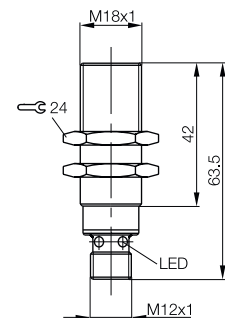
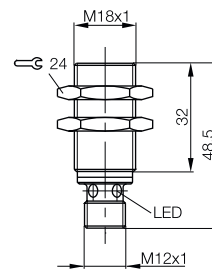
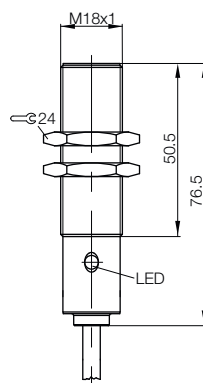
TRIPLEPROX

TRIPLEPROX

Model		M18x1	M18x1	M18x1
Installation type (observe instructions in the Basic Information chapter)		Flush	Quasi-flush	Quasi-flush
Rated switching distance s_n		8 mm	12 mm	12 mm
Assured switching distance s_a		0...6.4 mm	0...9.6 mm	0...9.6 mm
Switching distance marking		■ ■	■ ■ ■	■ ■ ■
PNP, NO	Ordering code	BES01CN	BES02Y5	BES02Y9
	Part number	BES 516-326-G-BO-C-PU-02	BES M18MD1-PSC12B-S04G	BES M18MG1-PSC12B-S04G
PNP, normally closed	Ordering code			
	Part number			
NPN, NO	Ordering code		BES02Y4	BES02Y8
	Part number		BES M18MD1-NSC12B-S04G	BES M18MG1-NSC12B-S04G
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		2.5 V	2 V	2 V
Rated insulation voltage U_i (protection class)		250 V AC (II)	75 V DC	75 V DC
Rated operating current I_e		200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		0...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		80 Hz	500 Hz	500 Hz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Approvals		CE, cULus	CE	CE
Special properties			Large switching distance	Large switching distance
Material	Housing	Brass-coated	Brass-coated	Brass-coated
	Sensing surface	PA 12	PBT	PBT
Connection		2 m PUR cable, 3x0.34 mm ²	M12 connector, 4-pin	M12 connector, 4-pin

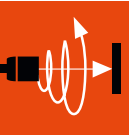
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request





M18x1	M18x1	M18x1	M18x1	M18x1
Not flush	Not flush	Not flush	Not flush	Not flush
8 mm	8 mm	8 mm	8 mm	8 mm
0...6.5 mm	0...6.5 mm	0...6.5 mm	0...6.5 mm	0...6.5 mm
■	■	■	■	■
BES00WM	BES02FK	BES02FM	BES03AW	BES01HY
BES 516-360-E5-Y-S4	BES 515-360-E5-T-S4	BES 515-360-SA12-S4-T	BES 516-360-S4-L	BES 516-360-S4-C
BES00LL				BES0193
BES 516-3026-E5-Y-S4				BES 516-3026-S4-C
BES00WT				
BES 516-361-E5-Y-S4				
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
3.5 V	3.5 V	3.5 V	2.5 V	1.5 V
75 V DC	75 DC	75 V DC	250 V AC (□)	250 V AC (□)
130 mA	130 mA	130 mA	400 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/No/No	Yes/Yes/Yes
-25...+70 °C	-40...+105 °C*	-40...+85 °C (momentarily 105 °C)	-40...+85 °C	-25...+70 °C
200 Hz	200 Hz	200 Hz	200 Hz	600 Hz
Yellow LED	No	No	Yellow LED	Yellow LED
IP 67	IP 69K, IP 68 as per BWN Pr. 27	IP 69K, IP 68 as per BWN Pr. 27	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
	Resistant to high-pressure cleaners	Resistant to high-pressure cleaners		
Brass-coated	Stainless steel	Stainless steel	Brass-coated	Brass-coated
PA 12	PA 12	PA 12	PA 12	PA 12
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

Cylinder Designs

Block Designs

DC 2-wire

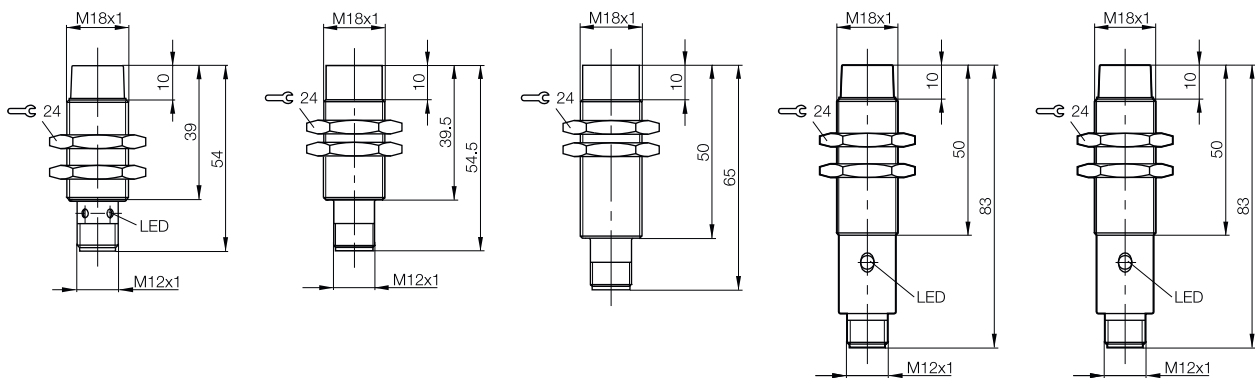
AC/DC 2-wire

AC 2-wire

Special Properties

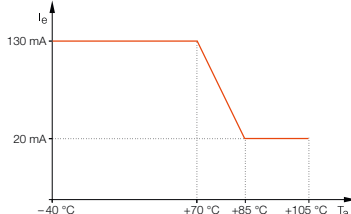
Analog Distance Measurement

Accessories



Recommended short-circuit protection device: Miniature fuse in accordance with IEC 60127-2 Sheet 1, ≤ 2 A (fast-acting). The fuse has to be in the load current line; the fuse may not be placed in the output line.

*max. load current over temperature



DC 3-/4-wire Inductive Sensors

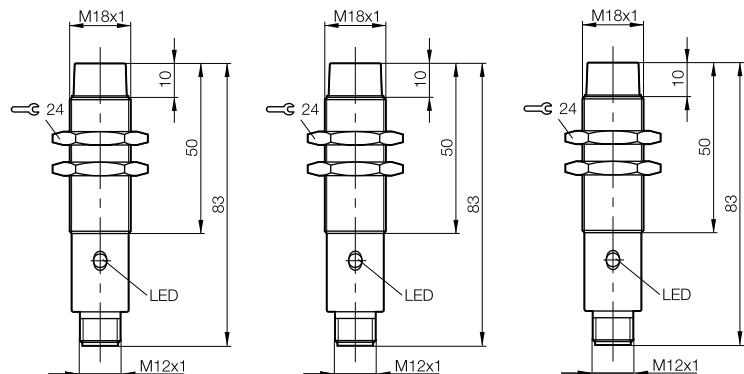
Cylinder designs, M18x1

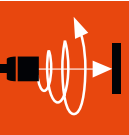


Model		M18x1	M18x1	M18x1
Installation type (observe instructions in the Basic Information chapter)		Not flush	Not flush	Not flush
Rated switching distance s_n		8 mm	8 mm	8 mm
Assured switching distance s_a		0...6.5 mm	0...6.5 mm	0...6.5 mm
Switching distance marking		■	■	■
PNP, NO	Ordering code			BES02FL
	Part number			BES 515-360-S4-C
PNP, normally closed	Ordering code			
	Part number			
PNP, complementary	Ordering code	BES016Y		
	Part number	BES 516-123-S4-C		
NPN, NO	Ordering code		BES01J5	
	Part number		BES 516-361-S4-C	
NPN, NC	Ordering code		BES019H	
	Part number		BES 516-3031-S4-C	
NPN, complementary	Ordering code		BES0171	
	Part number		BES 516-124-S4-C	
Supply voltage U_S		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		2.5 V	2.5 V	1.5 V
Rated insulation voltage U_i (protection class)		250 V AC (□)	250 V AC (□)	250 V AC (□)
Rated operating current I_e		200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-40...+85 °C	-25...+70 °C	-40...+85 °C
Switching frequency f max.		200 Hz	200 Hz	600 Hz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
Approvals		CE, cULus	CE, cULus	CE, cULus
Material	Housing	Brass-coated	Brass-coated	Stainless steel
	Sensing surface	PA 12	PA 12	PA 12
Connection		M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

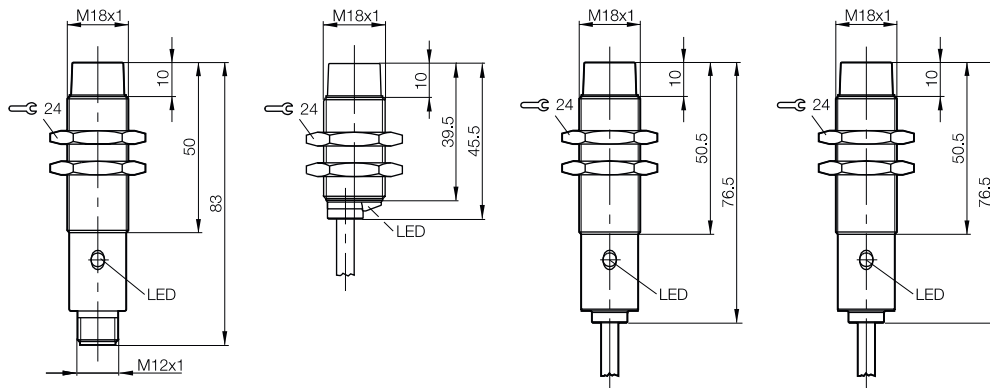
Additional cable lengths and PUR cable jacket material available on request





Inductive Sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder Designs
Block Designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Special Properties
Analog Distance Measurement
Accessories

M18x1 Not flush 8 mm 0...6.5 mm ■	M18x1 Not flush 8 mm 0...6.5 mm ■	M18x1 Not flush 8 mm 0...6.5 mm ■	M18x1 Not flush 8 mm 0...6.5 mm ■	
	BES00WH BES 516-360-E4-Y-02			
	BES00LH BES 516-3026-E4-Y-02		BES018Z BES 516-3026-BO-C-02	
BES02E1 BES 515-123-S4-C				
	BES00WN BES 516-361-E4-Y-02	BES01HZ BES 516-361-BO-C-02		
		BES019F BES 516-3031-BO-C-02		
10...30 V DC 2.5 V 250 V AC (□) 200 mA Yes/Yes/Yes -40...+85 °C 200 Hz Yellow LED IP 68 per BWN Pr. 20 CE, cULus Stainless steel PA 12 M12 connector, 4-pin	10...30 V DC 3.5 V 250 V AC (□) 130 mA Yes/Yes/Yes -25...+70 °C 200 Hz Yellow LED IP 68 per BWN Pr. 20 CE, cULus Brass-coated PA 12 2 m PVC cable, 3x0.34 mm ²	10...30 V DC 2.5 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...+70 °C 200 Hz Yellow LED IP 67 CE, cULus Brass-coated PA 12 2 m PVC cable, 3x0.34 mm ²	10...30 V DC 1.5 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...+70 °C 600 Hz Yellow LED IP 68 per BWN Pr. 20 CE, cULus Brass-coated PA 12 2 m PVC cable, 3x0.34 mm ²	



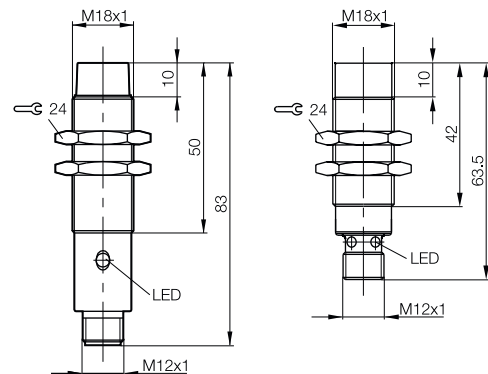


TRIPLEPROX

Model		M18x1	M18x1	
Installation type (observe instructions in the Basic Information chapter)		Not flush	Not flush	
Rated switching distance s_n		16 mm	20 mm	
Assured switching distance s_a		0...13 mm	0...16 mm	
Switching distance marking		■ ■	■ ■ ■	
PNP, NO	Ordering code	BES01HW	BES02Y7	
	Part number	BES 516-360-G-S4-H	BES M18ME1-PSC20F-S04G	
PNP, NC	Ordering code			
	Part number			
PNP, complementary	Ordering code	BES016W		
	Part number	BES 516-123-G-S4-H		
NPN, NO	Ordering code		BES02Y6	
	Part number		BES M18ME1-NSC20F-S04G	
NPN, complementary	Ordering code			
	Part number			
Supply voltage U_s		10...55 V DC	10...30 V DC	
Voltage drop U_d at I_e max.		2.5 V	2 V	
Rated insulation voltage U_i (protection class)		250 V AC (□)	75 V DC	
Rated operating current I_e		200 mA	200 mA	
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	
Switching frequency f max.		80 Hz	200 Hz	
Output function indicator		Yellow LED	Yellow LED	
Degree of protection as per IEC 60529		IP 68 per BWN Pr. 20	IP 67	
Approvals		CE	CE	
Special properties			Large switching distance	
Material	Housing	Brass-coated	Brass-coated	
	Sensing surface	PA 12	PBT	
Connection		M12 connector, 4-pin	M12 connector, 4-pin	

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request



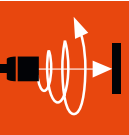
Reliably monitor speed

Two inductive sensors are sufficient to protect your system from overspeed. Attached to a perforated disk, they determine rotary speed and direction.

- Extremely reliable (HALT, EMC, shocks)
- For extreme conditions (temperature fluctuations)
- Long service life
- Insensitive to contamination



M30x1.5	M30x1.5	M30x1.5	M30x1.5	M30x1.5
Flush	Flush	Flush	Flush	Flush
10 mm	10 mm	10 mm	10 mm	10 mm
0...8 mm	0...8.1 mm	0...8.1 mm	0...8.1 mm	0...8.1 mm
■	■	■	■	■
BES00RP	BES01EE	BES02F1		BES00RF
BES 516-327-E5-Y-S4	BES 516-327-S4-C	BES 515-327-S4-C		BES 516-327-E4-Y-02
BES00LM	BES0195			
BES 516-3028-E5-Y-S4	BES 516-3028-S4-C			
	BES0167		BES02E0	
	BES 516-114-S4-C		BES 515-114-S4-C	
BES00W9	BES01HL			BES00W5
BES 516-359-E5-Y-S4	BES 516-359-S4-C			BES 516-359-E4-Y-02
	BES016J			
	BES 516-120-S4-C			
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
3.5 V	2.5 V	2.5 V	2.5 V	3.5 V
75 V DC	250 V AC (□)	250 V AC (□)	250 V AC (□)	75 V DC
130 mA	200 mA	200 mA	200 mA	130 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-40...+85 °C	-25...+70 °C
200 Hz	300 Hz	300 Hz	300 Hz	200 Hz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Brass-coated	Brass-coated	Stainless steel	Stainless steel	Brass-coated
PA 12	PA 12	PA 12	PA 12	PA 12
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	2 m PVC cable, 3x0.34 mm ²



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

Cylinder Designs

Block Designs

DC 2-wire

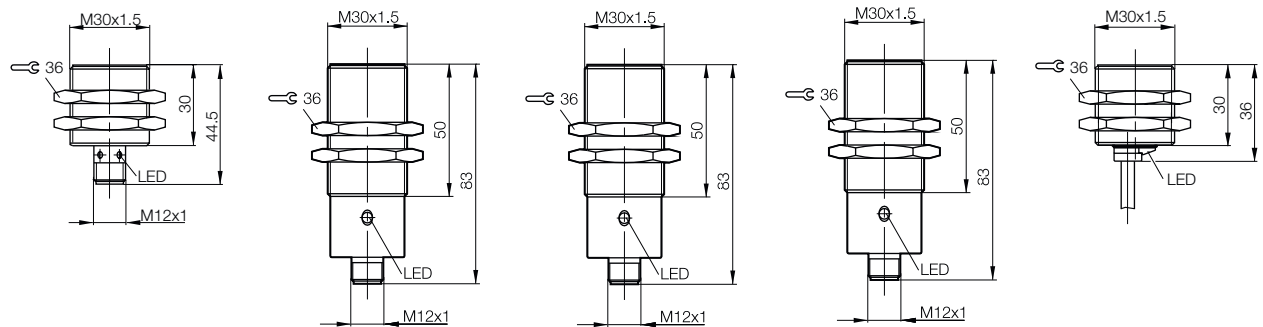
AC/DC 2-wire

AC 2-wire

Special Properties

Analog Distance Measurement

Accessories



DC 3-/4-wire Inductive Sensors

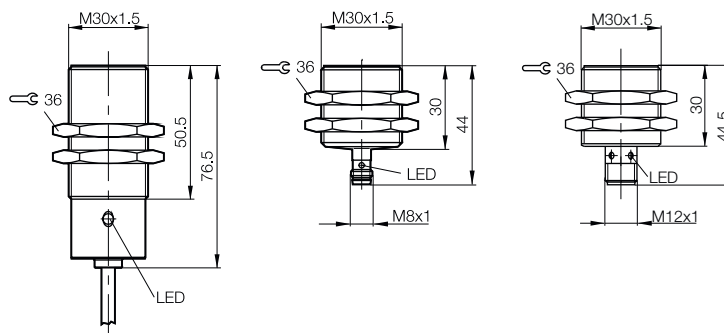
Cylinder designs, M30x1.5



Model		M30x1.5	M30x1.5	M30x1.5
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		10 mm	15 mm	15 mm
Assured switching distance s_a		0...8.1 mm	0...12 mm	0...12 mm
Switching distance marking		■	■■	■■■
PNP, NO	Ordering code	BES01E3	BES00RY	BES00RW
	Part number	BES 516-327-BO-C-02	BES 516-327-G-E5-Y-S49	BES 516-327-G-E5-Y-S4
PNP, NC	Ordering code			BES00LU
	Part number			BES 516-3028-G-E5-Y-S4
PNP, complementary	Ordering code			
	Part number			
NPN, NO	Ordering code	BES01HF	BES00WE	
	Part number	BES 516-359-BO-C-02	BES 516-359-G-E5-Y-S49	
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_o max.		2.5 V	3.5 V	3.5 V
Rated insulation voltage U_i (protection class)		250 V AC (□)	75 V DC	75 V DC
Rated operating current I_o		200 mA	130 mA	130 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		300 Hz	100 Hz	100 Hz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67	IP 68 per BWN Pr. 20
Approvals		CE, cULus	CE, cULus	CE, cULus
Special properties				
Material	Housing	Brass-coated	Brass-coated	Brass-coated
	Sensing surface	PA 12	PA 12	PA 12
Connection		2 m PVC cable, 3x0.34 mm ²	M8 connector, 3-pin	M12 connector, 4-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

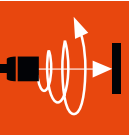
Additional cable lengths and PUR cable jacket material available on request





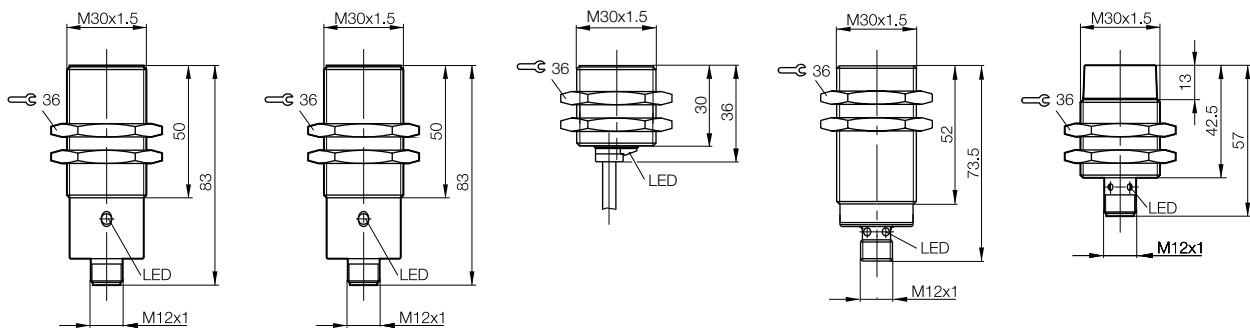
TRIPLEPROX

M30x1.5	M30x1.5	M30x1.5	M30x1.5	M30x1.5
Flush	Flush	Flush	Quasi-flush	Not flush
15 mm	15 mm	15 mm	22 mm	15 mm
0...12 mm	0...12 mm	0...12 mm	0...17.6 mm	0...12.2 mm
■ ■	■ ■	■ ■	■ ■ ■	■
BES01EA	BES01EC	BES00RR	BES02YM	BES00Y0
BES 516-327-G-S4-C	BES 516-327-G-S4-H	BES 516-327-G-E4-Y-02	BES M30MI1-PSC22B-S04G	BES 516-362-E5-Y-S4
		BES00LN	BES02YL	BES00LZ
		BES 516-3028-G-E4-Y-02	BES M30MI1-POC22B-S04G	BES 516-3029-E5-Y-S4
	BES0166			BES00Y4
	BES 516-114-G-S4-H			BES 516-363-E5-Y-S4
		BES00WA	BES02YK	
		BES 516-359-G-E4-Y-02	BES M30MI1-NSC22B-S04G	
10...30 V DC	10...55 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2.5 V	2.5 V	3.5 V	2 V	3.5 V
250 V AC (□)	250 V AC (□)	75 V DC	75 V DC	75 V DC
200 mA	200 mA	130 mA	200 mA	130 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
100 Hz	150 Hz	100 Hz	200 Hz	100 Hz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 67	IP 67
CE, cULus	CE	CE, cULus	CE	CE, cULus
			Large switching distance	
Brass-coated	Brass-coated	Brass-coated	Brass-coated	Brass-coated
PA 12	PA 12	PA 12	PBT	PA 12
M12 connector, 4-pin	M12 connector, 4-pin	2 m PVC cable, 3x0.34 mm ²	M12 connector, 4-pin	M12 connector, 4-pin



Inductive Sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder Designs
Block Designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Special Properties
Analog Distance Measurement

Accessories



DC 3-/4-wire Inductive Sensors

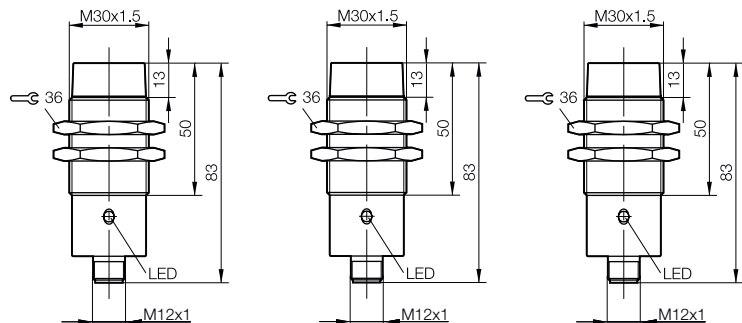
Cylinder designs, M30x1.5



Model		M30x1.5	M30x1.5	M30x1.5
Installation type (observe instructions in the Basic Information chapter)		Not flush	Not flush	Not flush
Rated switching distance s_n		15 mm	15 mm	15 mm
Assured switching distance s_a		0...12.2 mm	0...12.2 mm	0...12.2 mm
Switching distance marking		■	■	■
PNP, NO	Ordering code	BES01JE	BES03AL	BES01JF
	Part number	BES 516-362-S4-C	BES M30ML-PSC15F-S04G-002	BES 516-362-S4-H
PNP, NC	Ordering code	BES0198		
	Part number	BES 516-3029-S4-C		
PNP, complementary	Ordering code	BES0173		
	Part number	BES 516-125-S4-C		
NPN, NO	Ordering code	BES01JN	BES03AT	
	Part number	BES 516-363-S4-C	BES M30ML-NSC15F-S04G-002	
NPN, NC	Ordering code	BES019N		
	Part number	BES 516-3033-S4-C		
Supply voltage U_s		10...30 V DC	10...30 V DC	10...55 V DC
Voltage drop U_d at I_o max.		2.5 V	2.5 V	1.5 V
Rated insulation voltage U_i (protection class)		250 V AC (□)	250 V AC (□)	250 V AC (□)
Rated operating current I_o		200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		100 Hz	75 Hz	400 Hz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 68 per BWN Pr. 20	IP 67	IP 68 per BWN Pr. 20
Approvals		CE, cULus	CE	CE
Special properties				
Material	Housing	Brass-coated	Brass-coated	Brass-coated
	Sensing surface	PA 12	PA 12	PA 12
Connection		M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

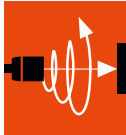
Additional cable lengths and PUR cable jacket material available on request





TRIPLEPROX

M30x1.5	M30x1.5	M30x1.5	M30x1.5	M30x1.5
Not flush	Not flush	Not flush	Not flush	Not flush
15 mm	15 mm	15 mm	30 mm	40 mm
0...12.2 mm	0...12.2 mm	0...12.2 mm	0...24.00 mm	0...32 mm
■	■	■	■ ■	■ ■ ■
BES02FN	BES00WU	BES01J6	BES01JC	BES02YJ
BES 515-362-S4-C	BES 516-362-E4-Y-02	BES 516-362-BO-C-02	BES 516-362-G-S4-H	BES M30MG1-PSC40F-S04G
	BES00LW			
	BES 516-3029-E4-Y-02			
		BES01JJ		
		BES 516-363-BO-C-02		
	BES00Y1	BES019L		BES02YH
	BES 516-363-E4-Y-02	BES 516-3033-BO-C-02		BES M30MG1-NSC40F-S04G
10...30 V DC	10...30 V DC	10...30 V DC	10...55 V DC	10...30 V DC
2.5 V	3.5 V	2.5 V	2.5 V	2 V
250 V AC (□)	75 V DC	250 V AC (□)	250 V AC	75 V DC
200 mA	130 mA	200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
100 Hz	100 Hz	100 Hz	70 Hz	100 Hz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 54
CE, cULus	CE, cULus	CE, cULus	CE	CE
				Large switching distance
Stainless steel	Brass-coated	Brass-coated	Brass-coated	Brass-coated
PA 12	PA 12	PA 12	PA 12	PBT
M12 connector, 4-pin	2 m PVC cable, 3x0.34 mm	2 m PVC cable, 3x0.34 mm	M12 connector, 4-pin	M12 connector, 4-pin



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

Cylinder Designs

Block Designs

DC 2-wire

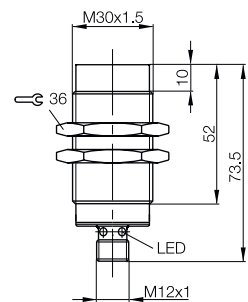
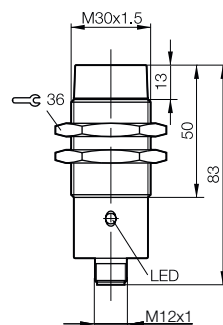
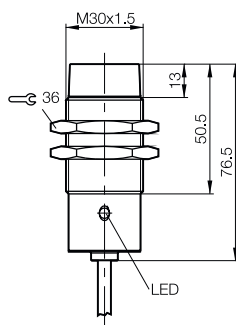
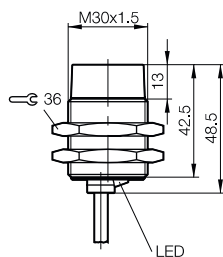
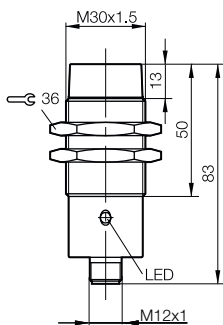
AC/DC 2-wire

AC 2-wire

Special Properties

Analog Distance Measurement

Accessories

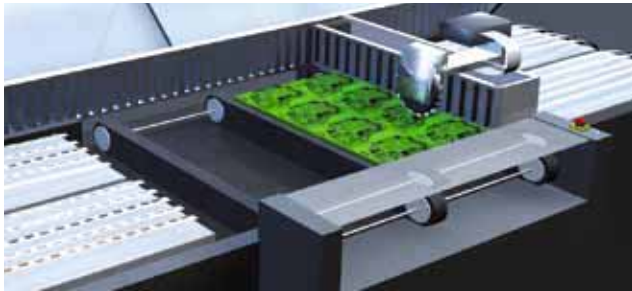


DC 3-/4-wire Inductive Sensors

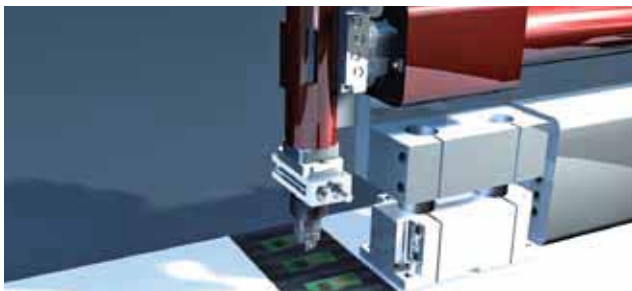
Block design, 5x5 mm

Five good reasons for using inductive 5x5 sensors

- One rugged, compact metal housing
- Two switching distance variants (flush mountable): 0.8 mm for high-precision applications, new 1.5 mm for more function reserve
- Three connections: Supply (+), Ground (-), Output. Easy to integrate into standard and special controllers.
- Four interface variants: PNP or NPN, normally open or normally closed
- Five millimeter installation height in the sensing direction



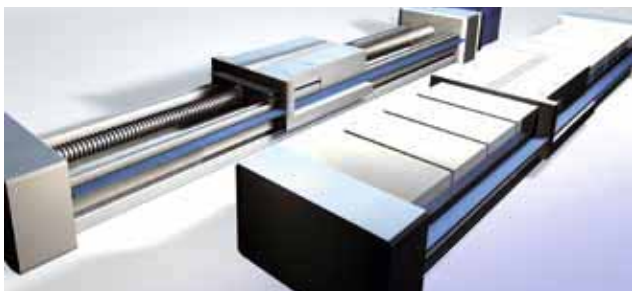
Electronics manufacturing: Mechatronic modules require miniature sensors. Balluff offers mini.s in the highest degree of precision.



Robotics automation: The trend towards miniaturization continues. Balluff is leading the way.



Punching/reshaping technology: Workpieces are getting smaller and smaller. Balluff sensors adapt to this.



Linear technology: Position detection in a simple manner through mini designs with maximum performance.

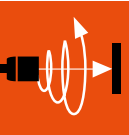
Model		
Installation type (observe instructions in the Basic Information chapter)		
Rated switching distance s_n		
Assured switching distance s_a		
Switching distance marking		
PNP, NO	Ordering code	
	Part number	
PNP, NC	Ordering code	
	Part number	
NPN, NO	Ordering code	
	Part number	
NPN, NC	Ordering code	
	Part number	
Supply voltage U_S		
Voltage drop U_d at I_o max.		
Rated insulation voltage U_i		
Rated operating current I_o		
Polarity reversal protected/transposition protected/short-circuit protected		
Ambient temperature T_a		
Switching frequency f max.		
Output function indicator		
Degree of protection as per IEC 60529		
Approvals		
Special properties		
Material	Housing	
	Sensing surface	
Connection		

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

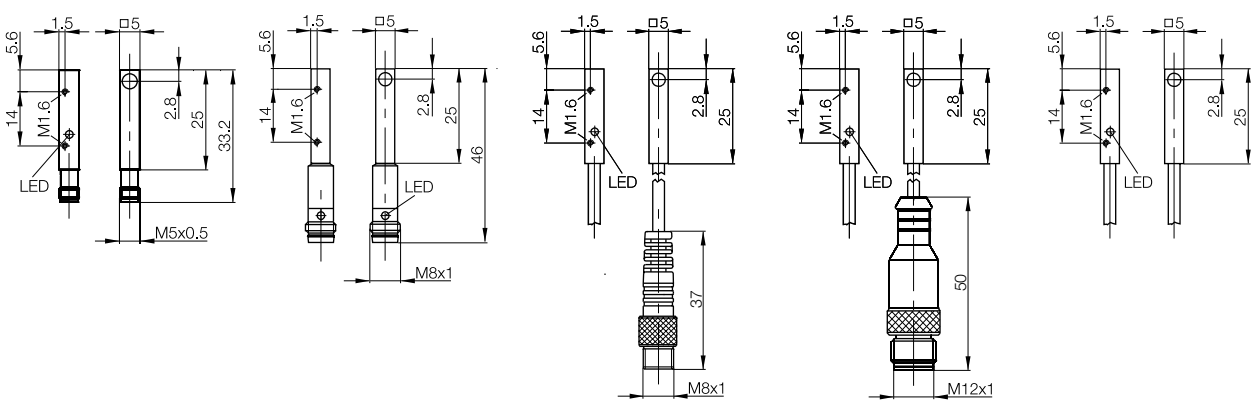
Additional cable lengths on request.



5x5 mm Flush 0.8 mm 0...0.65 mm ■	5x5 mm Flush 0.8 mm 0...0.65 mm ■	5x5 mm Flush 0.8 mm 0...0.65 mm ■	5x5 mm Flush 0.8 mm 0...0.65 mm ■	5x5 mm Flush 0.8 mm 0...0.65 mm ■	5x5 mm Flush 0.8 mm 0...0.65 mm ■
BES01RM BES Q05AC-PSC08B-S26G	BES01ZF BES 516-3040-I02-C-S49	BES019W BES 516-3040-I02-C-S49-00,3	BES019T BES 516-3040-I02-C-S4-00,3	BES019P BES 516-3040-I02-C-PU-02	BES01A1 BES 516-3042-I02-C-PU-02
BES01RH BES Q05AC-POC08B-S26G	BES01ZH BES 516-3042-I02-C-S49				BES019Y BES 516-3041-I02-C-PU-02
BES01RA BES Q05AC-NSC08B-S26G	BES01A0 BES 516-3041-I02-C-S49				BES01A3 BES 516-3043-I02-C-PU-02
BES01R6 BES Q05AC-NOC08B-S26G	BES01A5 BES 516-3043-I02-C-S49				
10...30 V DC 2.5 V 75 V DC 100 mA Yes/Yes/Yes -25...+70 °C 3 kHz Yellow LED IP 67 CE, cULus	10...30 V DC 2.5 V 75 V DC 100 mA Yes/Yes/Yes -25...+70 °C 3 kHz Yellow LED IP 67 CE, cULus	10...30 V DC 2.5 V 75 V DC 100 mA Yes/Yes/Yes -25...+70 °C 3 kHz Yellow LED IP 67 CE, cULus	10...30 V DC 2.5 V 75 V DC 100 mA Yes/Yes/Yes -25...+70 °C 3 kHz Yellow LED IP 67 CE, cULus	10...30 V DC 2.5 V 75 V DC 100 mA Yes/Yes/Yes -25...+70 °C 3 kHz Yellow LED IP 67 CE, cULus	10...30 V DC 2.5 V 75 V DC 100 mA Yes/Yes/Yes -25...+70 °C 3 kHz Yellow LED IP 67 CE, cULus
Narrow design Anodized aluminum PBT M5 connector, 3-pin	Narrow design Anodized aluminum PBT M8 connector, 3-pin	Narrow design Anodized aluminum PBT 0.3 m PUR cable with M8 connector, 3-pin	Narrow design Anodized aluminum PBT 0.3 m PUR cable with M12 connector, 4-pin	Narrow design Anodized aluminum PBT 2 m PUR cable, 3x0.14 mm ²	



- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- Cylinder Designs
- Block Designs
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- Analog Distance Measurement
- Accessories



DC 3-/4-wire Inductive Sensors

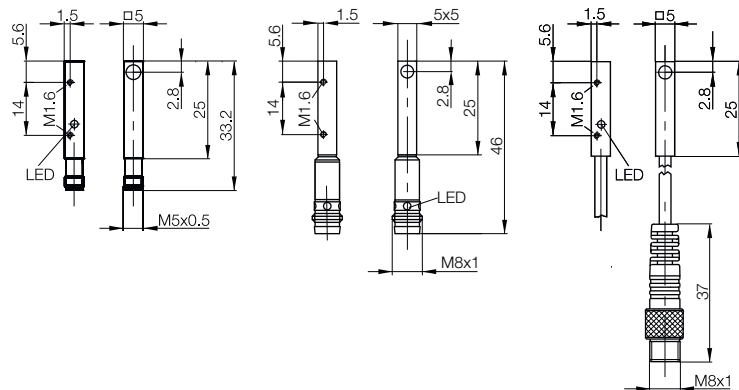
Block design, 5x5 mm

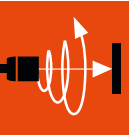


Model		5x5 mm	5x5 mm	5x5 mm
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		1.5 mm	1.5 mm	1.5 mm
Assured switching distance s_a		0...1.2 mm	0...1.2 mm	0...1.2 mm
Switching distance marking		■ ■	■ ■	■ ■
PNP, NO	Ordering code	BES01RP	BES01RR	BES03UW
	Part number	BES Q05AC-PSC15B-S26G	BES Q05AC-PSC15B-S49G	BES Q05AC-PSC15B-EP00,3-GS49
PNP, NC	Ordering code	BES01RK	BES01RL	
	Part number	BES Q05AC-POC15B-S26G	BES Q05AC-POC15B-S49G	
NPN, NO	Ordering code	BES01RE	BES01RF	
	Part number	BES Q05AC-NSC15B-S26G	BES Q05AC-NSC15B-S49G	
NPN, NC	Ordering code	BES01R8	BES01R9	
	Part number	BES Q05AC-NOC15B-S26G	BES Q05AC-NOC15B-S49G	
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_o max.		2.5 V	3 V	3 V
Rated insulation voltage U_i		75 V DC	75 V DC	75 V DC
Rated operating current I_o		100 mA	100 mA	100 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		2 kHz	2 kHz	2 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Approvals		CE, cULus	CE, cULus	CE, cULus
Special properties		Narrow design	Narrow design	Narrow design
Material	Housing	Stainless steel	Stainless steel	Stainless steel
	Sensing surface	PBT	PBT	PBT
Connection		M5 connector, 3-pin	M8 connector, 3-pin	0.3 m PUR cable with M8 connector, 3-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

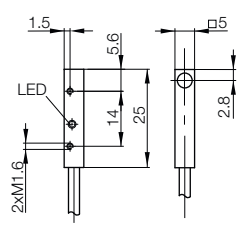
Additional cable lengths on request.





5x5 mm				
Flush				
1.5 mm				
0...1.2 mm				
■ ■				
BES01RN				
BES Q05AC-PSC15B-EP02				
BES01RJ				
BES Q05AC-POC15B-EP02				
BES01RC				
BES Q05AC-NSC15B-EP02				
BES01R7				
BES Q05AC-NOC15B-EP02				
10...30 V DC				
3 V				
75 V DC				
100 mA				
Yes/Yes/Yes				
-25...+70 °C				
2 kHz				
Yellow LED				
IP 67				
CE, cULus				
Narrow design				
Stainless steel				
PBT				
2 m PUR cable, 3x0.14 mm ²				

Inductive Sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder Designs
Block Designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Special Properties
Analog Distance Measurement
Accessories



DC 3-/4-wire Inductive Sensors

Block design, 8x8 mm



SUPERSHORTIES



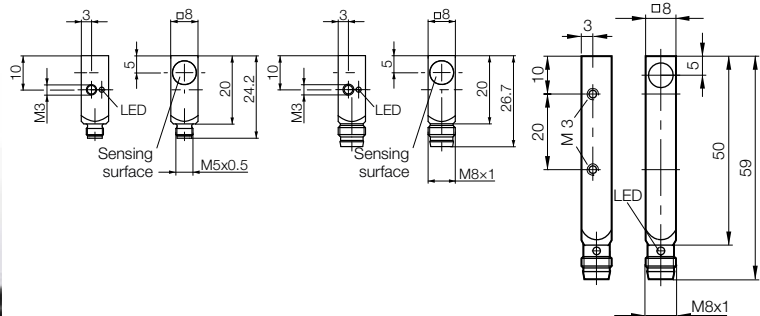
SUPERSHORTIES



Model		8x8 mm	8x8 mm	8x8 mm
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		1.5 mm	1.5 mm	1.5 mm
Assured switching distance s_a		0...1.2 mm	0...1.2 mm	0...1.2 mm
Switching distance marking		■	■	■
PNP, NO	Ordering code	BES03U1	BES03Y6	BES0180
	Part number	BES Q08MEC-PSC15B-S26G	BES Q08MEC-PSC15B-S49G	BES 516-300-S166-S49
PNP, NC	Ordering code	BES03YE	BES03U0	BES0187
	Part number	BES Q08MEC-POC15B-S26G	BES Q08MEC-POC15B-S49G	BES 516-300-S180-S49
NPN, NO	Ordering code	BES03Y7	BES03U8	BES0184
	Part number	BES Q08MEC-NSC15B-S26G	BES Q08MEC-NSC15B-S49G	BES 516-300-S170-S49
NPN, NC	Ordering code	BES03U9	BES03YC	BES018H
	Part number	BES Q08MEC-NOC15B-S26G	BES Q08MEC-NOC15B-S49G	BES 516-300-S264-S49
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_o max.		2.8 V	2.8 V	2.5 V
Rated insulation voltage U_i		75 V DC	75 V DC	75 V DC
Rated operating current I_o		200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		3 kHz	3 kHz	5 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Approvals		CE, cULus	CE, cULus	CE, cULus
Special properties		Short design	Short design	
Material	Housing	Brass-coated	Brass-coated	Cast zinc
	Sensing surface	PBT	PBT	PBT
Connection		M5 connector, 3-pin	M8 connector, 3-pin	M8 connector, 3-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request





SUPERSHORTIES



SUPERSHORTIES

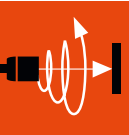


SUPERSHORTIES

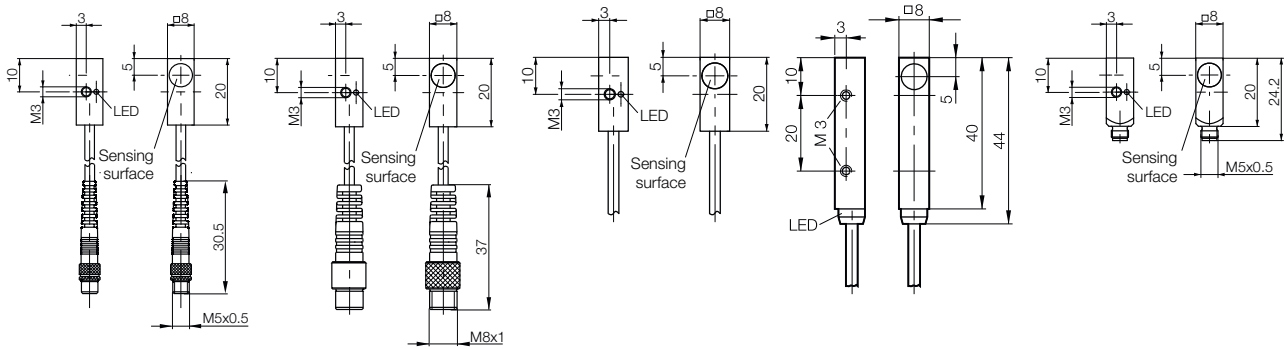


SUPERSHORTIES

8x8 mm	8x8 mm	8x8 mm	8x8 mm	8x8 mm
Flush	Flush	Flush	Flush	Flush
1.5 mm	1.5 mm	1.5 mm	1.5 mm	2 mm
0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.6 mm
■	■	■	■	■ ■
BES041J	BES041C	BES03TZ	BES017R	BES03U4
BES Q08MEC-PSC15B-EP00,3-GS26	BES Q08MEC-PSC15B-EP00,3-GS49	BES Q08MEC-PSC15B-EP02	BES 516-300-S166-02	BES Q08MEC-PSC20B-S26G
BES041K	BES041E	BES03Y5		BES03YH
BES Q08MEC-POC15B-EP00,3-GS26	BES Q08MEC-POC15B-EP00,3-GS49	BES Q08MEC-POC15B-EP02		BES Q08MEC-POC20B-S26G
BES041L	BES041F	BES03YA		BES03Y9
BES Q08MEC-NSC15B-EP00,3-GS26	BES Q08MEC-NSC15B-EP00,3-GS49	BES Q08MEC-NSC15B-EP02		BES Q08MEC-NSC20B-S26G
BES041M	BES041H	BES03U7		BES03UE
BES Q08MEC-NOC15B-EP00,3-GS26	BES Q08MEC-NOC15B-EP00,3-GS49	BES Q08MEC-NOC15B-EP02		BES Q08MEC-NOC20B-S26G
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2.8 V	2.8 V	2.8 V	2.5 V	2.8 V
75 V DC	75 V DC	75 V DC	75 V DC	75 V DC
200 mA	200 mA	200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
3 kHz	3 kHz	3 kHz	3 kHz	3 kHz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Short design	Short design	Short design		Short design
Brass-coated	Brass-coated	Brass-coated	Cast zinc	Brass-coated
PBT	PBT	PBT	PBT	PBT
0.3 m PUR cable with M5 connector, 3-pin	0.3 m PUR cable with M8 connector, 3-pin	2 m PUR cable, 3x0.14 mm ²	2 m PVC cable, 3x0.14 mm ²	M5 connector, 3-pin



- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- Cylinder Designs
- Block Designs**
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- Analog Distance Measurement
- Accessories



DC 3-/4-wire Inductive Sensors

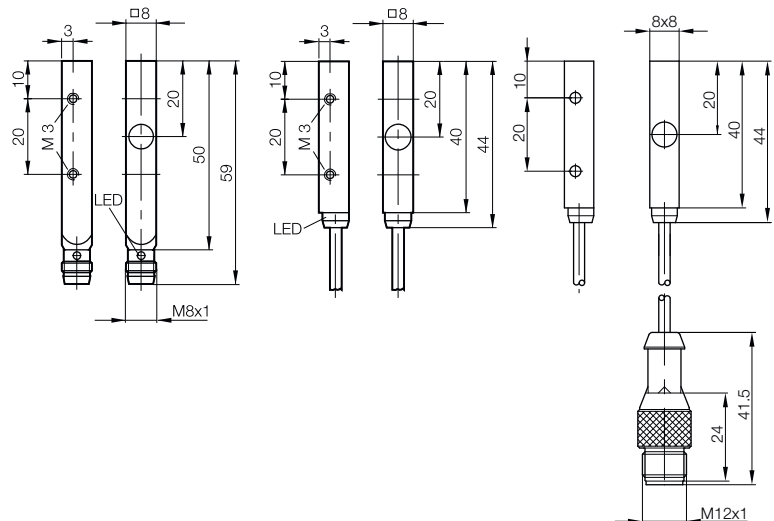
Block design, 8x8 mm



Model		8x8 mm	8x8 mm	8x8 mm
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		1.5 mm	1.5 mm	1.5 mm
Assured switching distance s_a		0...1.2 mm	0...1.2 mm	0...1.2 mm
Switching distance marking		■	■	■
PNP, NO	Ordering code	BES018C	BES0189	BES0188
	Part number	BES 516-300-S202-S49	BES 516-300-S202-02	BES 516-300-S202-00,3-S4
PNP, NC	Ordering code	BES018J		
	Part number	BES 516-300-S272-S49		
NPN, NO	Ordering code			
	Part number			
NPN, NC	Ordering code			
	Part number			
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_o max.		2.5 V	2.5 V	2.5 V
Rated insulation voltage U_i		75 V DC	75 V DC	75 V DC
Rated operating current I_o		200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		5 kHz	5 kHz	5 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Approvals		CE, cULus	CE, cULus	CE, cULus
Special properties				
Material	Housing	Cast zinc	Cast zinc	Cast zinc
	Sensing surface	PBT	PBT	PBT
Connection		M8 connector, 3-pin	2 m PVC cable, 3x0.14 mm ²	0.3 m PUR cable with M12 connector, 4-pin

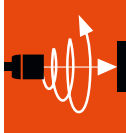
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths on request.





SUPERSHORTIES		SUPERSHORTIES		SUPERSHORTIES		SUPERSHORTIES	
8x8 mm	8x8 mm	8x8 mm	8x8 mm	8x8 mm	8x8 mm	8x8 mm	8x8 mm
Flush	Flush	Flush	Flush	Flush	Flush	Flush	Flush
2 mm	2 mm	2 mm	2 mm	2 mm	2 mm	2 mm	2 mm
0...1.6 mm	0...1.6 mm	0...1.6 mm	0...1.6 mm	0...1.6 mm	0...1.6 mm	0...1.6 mm	0...1.6 mm
■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
BES03Y8	BES01U2	BES01UW	BES041U	BES041N	BES03U3	BES01TF	BES041P
BES Q08MEC-PSC20B-S49G	BES Q08ZC-PSC20B-S49G	BES Q08ZE-PSC20B-S49G	BES Q08MEC-PSC20B-EP00,3-GS26	BES Q08MEC-PSC20B-EP00,3-GS49	BES Q08MEC-POC20B-S49G	BES Q08ZC-POC20B-S49G	BES Q08MEC-POC20B-EP00,3-GS49
BES03U3	BES01TF	BES01UK	BES041W	BES041P	BES03UC	BES01T3	BES041R
BES Q08MEC-POC20B-S49G	BES Q08ZC-POC20B-S49G	BES Q08ZE-POC20B-S49G	BES Q08MEC-POC20B-EP00,3-GS26	BES Q08MEC-POC20B-EP00,3-GS49	BES Q08MEC-NSC20B-S49G	BES Q08ZC-NSC20B-S49G	BES Q08MEC-NSC20B-EP00,3-GS49
BES03YJ	BES01RW	BES01U6	BES041Y	BES041Z	BES03UJ	BES01R3	BES041T
BES Q08MEC-NOC20B-S49G	BES Q08ZC-NOC20B-S49G	BES Q08ZE-NOC20B-S49G	BES Q08MEC-NSC20B-EP00,3-GS26	BES Q08MEC-NSC20B-EP00,3-GS49	BES Q08MEC-NOC20B-S49G	BES Q08ZC-NOC20B-S49G	BES Q08MEC-NOC20B-EP00,3-GS49
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2.8 V	2.5 V	2.5 V	2.8 V	2.8 V	2.8 V	2.5 V	2.8 V
75 V DC	75 V DC	75 V DC	75 V DC	75 V DC	75 V DC	75 V DC	75 V DC
200 mA	200 mA	200 mA	200 mA	200 mA	200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
3 kHz	3 kHz	3 kHz	3 kHz	3 kHz	3 kHz	3 kHz	3 kHz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Short design			Short design	Short design	Short design		Short design
Brass-coated	Cast zinc	Cast zinc	Brass-coated	Brass-coated	Brass-coated		Brass-coated
PBT	PBT	PBT	PBT	PBT	PBT		PBT
M8 connector, 3-pin	M8 connector, 3-pin	M8 connector, 3-pin	0.3 m PUR cable with M5 connector, 3-pin	0.3 m PUR cable with M8 connector, 3-pin			



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

Cylinder Designs

Block Designs

DC 2-wire

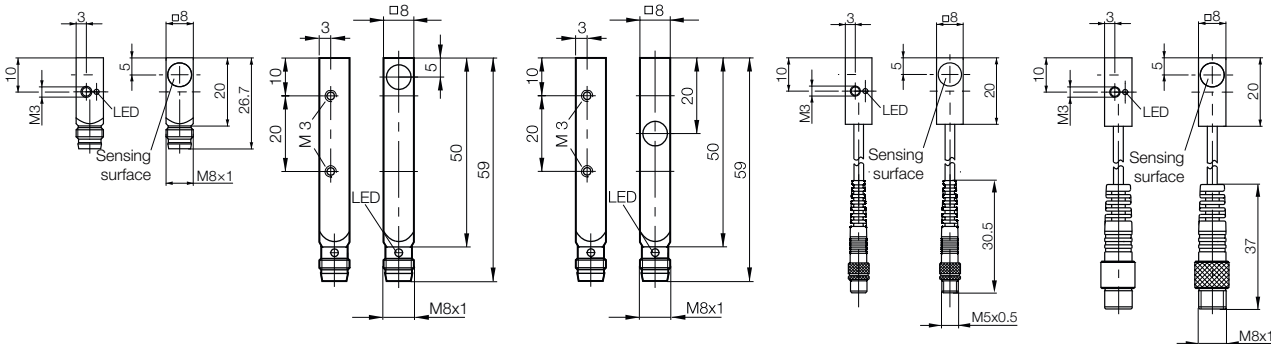
AC/DC 2-wire

AC 2-wire

Special Properties

Analog Distance Measurement

Accessories



DC 3-/4-wire Inductive Sensors

Block design, 8x8 mm

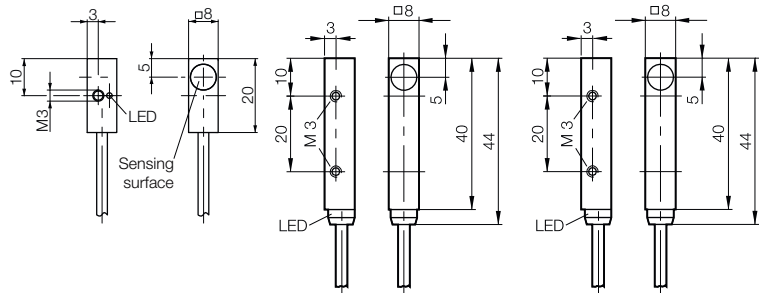


SUPERSHORTIES

Model		8x8 mm	8x8 mm	8x8 mm
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		2 mm	2 mm	2 mm
Assured switching distance s_a		0...1.6 mm	0...1.6 mm	0...1.6 mm
Switching distance marking		■ ■	■ ■	■ ■
PNP, NO	Ordering code	BES03U2	BES01TZ	BES01TN
	Part number	BES Q08MEC-PSC20B-EP02	BES Q08ZC-PSC20B-BV02	BES Q08ZC-PSC20B-BP02
PNP, NC	Ordering code	BES03YK	BES01TA	BES01T7
	Part number	BES Q08MEC-POC20B-EP02	BES Q08ZC-POC20B-BV02	BES Q08ZC-POC20B-BP02
NPN, NO	Ordering code		BES01T2	BES01RZ
	Part number		BES Q08ZC-NSC20B-BV02	BES Q08ZC-NSC20B-BP02
NPN, NC	Ordering code	BES03UA	BES01RU	BES01TL
	Part number	BES Q08MEC-NOC20B-EP02	BES Q08ZC-NOC20B-BV02	BES Q08ZC-NOC20B-BP02
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_o max.		2.8 V	2.5 V	2.5 V
Rated insulation voltage U_i		75 V DC	75 V DC	75 V DC
Rated operating current I_o		200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		3 kHz	3 kHz	3 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Approvals		CE, cULus	CE, cULus	CE, cULus
Special properties				
Material	Housing	Brass-coated	Cast zinc	Cast zinc
	Sensing surface	PBT	PBT	PBT
Connection		2 m PUR cable,	2 m PVC cable,	2 m PUR cable,
		3x0.14 mm ²	3x0.14 mm ²	3x0.14 mm ²

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

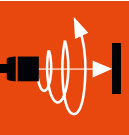
Additional cable lengths and PUR cable jacket material available on request



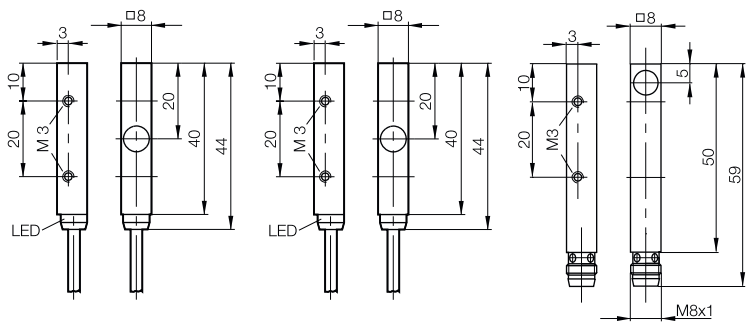


TRIPLEPROX

8x8 mm	8x8 mm	8x8 mm		
Flush	Flush	Quasi-flush		
2 mm	2 mm	3 mm		
0...1.6 mm	0...1.6 mm	0...2.4 mm		
■ ■	■ ■	■ ■ ■		
BES01UR	BES01UM	BES01U4		
BES Q08ZE-PSC20B-BV02	BES Q08ZE-PSC20B-BP02	BES Q08ZC-PSC30B-S49G		
BES01UH	BES01UE			
BES Q08ZE-POC20B-BV02	BES Q08ZE-POC20B-BP02			
BES01UA	BES01U7			
BES Q08ZE-NSC20B-BV02	BES Q08ZE-NSC20B-BP02			
10...30 V DC	10...30 V DC	10...30 V DC		
2.5 V	2.5 V	2 V		
75 V DC	75 V DC	75 V DC		
200 mA	200 mA	200 mA		
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes		
-25...+70 °C	-25...+70 °C	-25...+70 °C		
3 kHz	3 kHz	1 kHz		
Yellow LED	Yellow LED	Yellow LED		
IP 67	IP 67	IP 67		
CE, cULus	CE, cULus	CE		
		Long range		
Cast zinc	Cast zinc	Brass-coated		
PBT	PBT	PBT		
2 m PVC cable, 3x0.14 mm ²	2 m PUR cable, 3x0.14 mm ²	M8 connector, 3-pin		



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DC 3-/4-wire Inductive Sensors

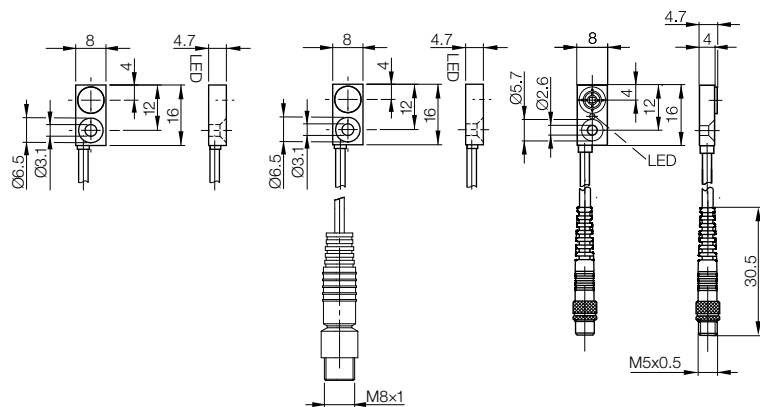
Block designs, 8×16×4.7 mm R04, 8×16×4 mm R04



Model	8×18×4.7 mm R04	8×18×4.7 mm R04	8×16×4 mm R04
Installation type (observe instructions in the Basic Information chapter)	Flush	Flush	Flush
Rated switching distance s_n	2 mm	2 mm	1.5 mm
Assured switching distance s_a	0...1.6 mm	0...1.6 mm	0...1.2 mm
Switching distance marking	■ ■	■ ■	■
PNP, NO	Ordering code BES04F6	Ordering code BES04FA	Ordering code BES01YC
	Part number BES R04MC-PSC20B-EP02-106	Part number BES R04MC-PSC20B-EP00,3-GS49-106	Part number BES R04KC-PSC15B-EP00,2-GS26
PNP, NC	Ordering code BES04F5	Ordering code BES04F8	Ordering code BES01Y7
	Part number BES R04MC-POC20B-EP02-106	Part number BES R04MC-POC20B-EP00,3-GS49-106	Part number BES R04KC-POC15B-EP00,2-GS26
NPN, NO	Ordering code BES04F4	Ordering code BES04F9	
	Part number BES R04MC-NSC20B-EP02-106	Part number BES R04MC-NSC20B-EP00,3-GS49-106	
NPN, NC	Ordering code BES04F3	Ordering code BES04F7	Ordering code BES01WY
	Part number BES R04MC-NOC20B-EP02-106	Part number BES R04MC-NOC20B-EP00,3-GS49-106	Part number BES R04KC-NOC15B-EP00,2-GS26
Supply voltage U_s	10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_o max.	2.5 V	2.5 V	1.5 V
Rated insulation voltage U_i	75 V DC	75 V DC	75 V DC
Rated operating current I_o	100 mA	100 mA	100 mA
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a	-25...70 °C	-25...70 °C	-25...+70 °C
Switching frequency f max.	5 kHz	5 kHz	2.5 kHz
Output function indicator	Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67
Approvals	CE, cULus	CE, cULus	CE, cULus
Material	Housing: Brass-coated Sensing surface: Ceramic	Housing: Brass-coated Sensing surface: Ceramic	PA 6 (fiberglass reinforced)
Connection	2 m PUR cable, 3×0.1 mm ²	0.3 m PUR cable with M8 connector, 3-pin	0.2 m PUR cable with M5 connector, 3-pin

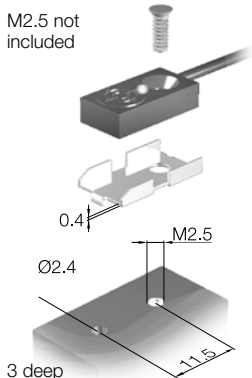
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request



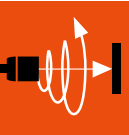
Mounting bracket BES R04-MF-01

For BES R04... with s_n 1.5 mm
(please order separately)

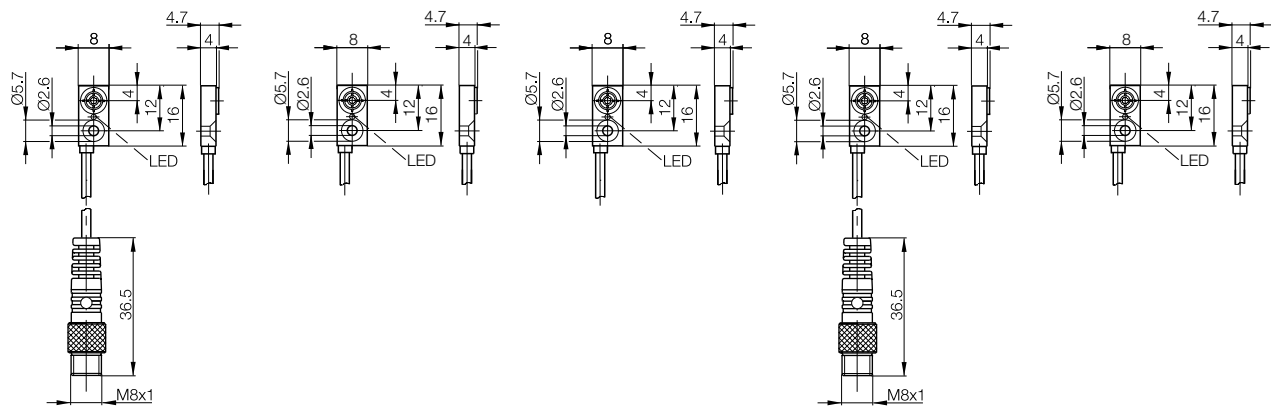




8×16×4 mm R04	8×16×4 mm R04	8×16×4 mm R04	8×16×4 mm R04	8×16×4 mm R04
Flush	Flush	Flush	Not flush	Not flush
1.5 mm	1.5 mm	1.5 mm	2.5 mm	2.5 mm
0...1.2 mm	0...1.2 mm	0...1.2 mm	0...2.2 mm	0...2.2 mm
■	■	■	■ ■	■ ■
BES01YE	BES01YJ	BES01YF	BES01YM	BES01YN
BES R04KC-PSC15B-EP00,3-GS49	BES R04KC-PSC15B-EV02	BES R04KC-PSC15B-EP02	BES R04KC-PSC25F-EP00,3-GS49	BES R04KC-PSC25F-EP02
BES01Y8	BES03J1		BES0447	
BES R04KC-POC15B-EP00,3-GS49	BES R04KC-POC15B-EV02		BES R04KC-POC25F-EP00,3-GS49	
	BES01Y3			
	BES R04KC-NSC15B-EV02			
	BES01WZ			
	BES R04KC-NOC15B-EV02			
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
1.5 V	1.8 V	2.5 V	2.5 V	2.5 V
75 V DC	75 V DC	75 V DC	75 V DC	75 V DC
100 mA	100 mA	100 mA	100 mA	100 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
2.5 kHz	2.5 kHz	2.5 kHz	3 kHz	3 kHz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
PA 6 (fiberglass reinforced)	PA 6 (fiberglass reinforced)	PA 6 (fiberglass reinforced)	PA 6 (fiberglass reinforced)	PA 6 (fiberglass reinforced)
PA 6 (fiberglass reinforced)	PA 6 (fiberglass reinforced)	PA 6 (fiberglass reinforced)	PA 6 (fiberglass reinforced)	PA 6 (fiberglass reinforced)
0.3 m PUR cable with M8 connector, 3-pin	2 m PVC cable, 3×0.09 mm ²	2 m PUR cable, 3×0.1 mm ²	0.3 m PUR cable with M8 connector, 3-pin	2 m PUR cable, 3×0.1 mm ²

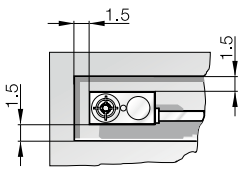


Inductive Sensors
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Installation notice for BES R04... with s_n 2.5 mm

Aluminum: can be mounted completely flush
Steel: all the way around with a 1.5 mm clear zone



DC 3-/4-wire Inductive Sensors

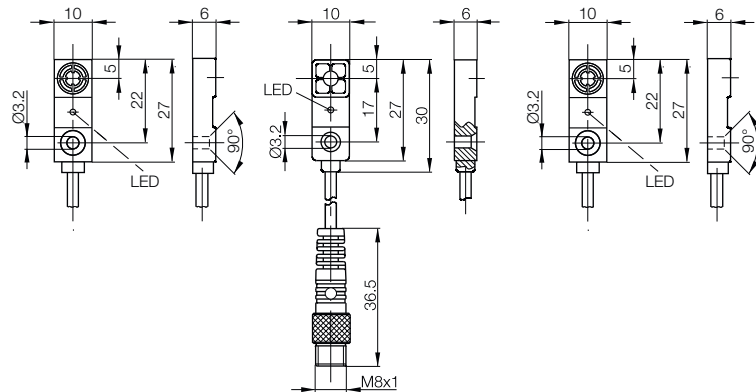
Block designs, 10×30×6 mm R03



Model		10×30×6 mm R03	10×30×6 mm R03	10×30×6 mm R03
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		2 mm	3 mm	3 mm
Assured switching distance s_a		0...1.6 mm	0...2.4 mm	0...2.4 mm
Switching distance marking		■	■	■
PNP, NO	Ordering code	BES03J0	BES01WP	BES01WR
	Part number	BES R03KC-PSC20B-EP02	BES R03KC-PSC30B-BP00,3-GS49	BES R03KC-PSC30B-EP02
NPN, NO	Ordering code			
	Part number			
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		1.5 V	1.8 V	2.5 V
Rated insulation voltage U_i		75 V DC	75 V DC	75 V DC
Rated operating current I_e		100 mA	100 mA	100 mA
Polarity reversal protected/transposition protected/short-circuit protected		No/No/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		1 kHz	3 kHz	3 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Approvals		CE, cULus	CE, cULus	CE, cULus
Material	Housing	PA 6	PA 6	PA 6
	Sensing surface	PA 6	PA 6	PA 6
Connection		2 m PUR cable, 3×0.14 mm ²	0.3 m PUR cable with M8 connector, 3-pin	2 m cable TPU, 3×0.14 mm ²

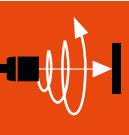
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request

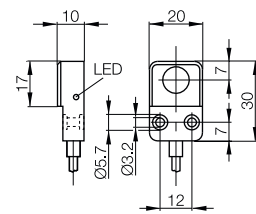
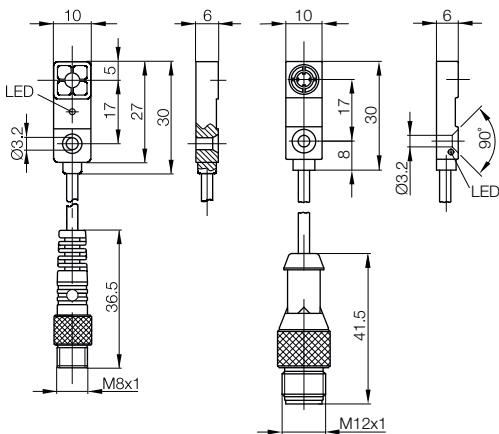




10×30×6 mm R03 Not flush 3 mm 0...2.4 mm ■	10×30×6 mm R03 Not flush 3 mm 0...2.4 mm ■		30×20×10 mm Flush 2 mm 0...1.6 mm ■	
BES02ZN BES R03KC-PSC30F-BV00.2-GS49	BES0397 BES R03KC-PSC30F-BV00.3-GS04		BES033J BES 516-300-S279	
			BES033H BES 516-300-S255	
10...30 V DC 1.5 V 75 V DC 100 mA No/No/Yes -25...+70 °C 500 Hz Yellow LED IP 67	10...30 V DC 1.5 V 75 V DC 100 mA No/No/Yes -25...+70 °C 500 Hz Yellow LED IP 67		10...30 V DC 0.5 V 75 V DC 50 mA Yes/No/No -25...+70 °C 1.5 kHz Yes/No IP 65	
PA 6 PA 6 0.2 m PVC cable with M8 connector, 3-pin	PA 6 PA 6 0.3 m PVC cable with M12 connector, 3-pin		Anodized GD-Al PBT 5 m PVC cable, 3×0.14 mm ²	



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Recommended short-circuit protection device: Miniature fuse in accordance with IEC 60127-2 Sheet 1, ≤ 2 A (fast-acting). The fuse has to be in the load current line; the fuse may not be placed in the output line.

DC 3-/4-wire Inductive Sensors

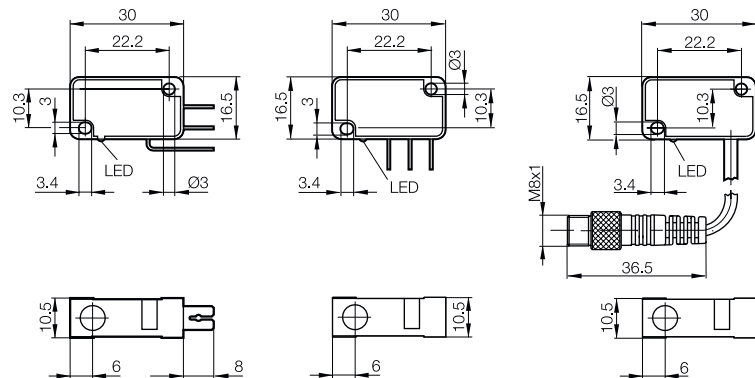
Block designs, 16×30×10 mm

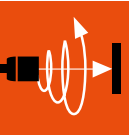


		16×30×10 mm	16×30×10 mm	16×30×10 mm
Model		16×30×10 mm	16×30×10 mm	16×30×10 mm
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		2 mm	2 mm	2 mm
Assured switching distance s_a		0...1.6 mm	0...1.6 mm	0...1.6 mm
Switching distance marking		■	■	■
PNP, NO	Ordering code	BES01N2	BES01N1	BES01NA
	Part number	BES 517-398-N2-C	BES 517-398-N1-C	BES 517-398-NO-C-S49-00,2
PNP, NC	Ordering code	BES01MK	BES01MJ	
	Part number	BES 517-351-N2-C	BES 517-351-N1-C	
PNP, complementary	Ordering code			
	Part number			
NPN, NO	Ordering code	BES01NE	BES01NC	BES01NM
	Part number	BES 517-399-N2-C	BES 517-399-N1-C	BES 517-399-NO-C-S49-00,2
NPN, NC	Ordering code	BES01MW	BES01MU	
	Part number	BES 517-352-N2-C	BES 517-352-N1-C	
NPN, complementary	Ordering code			
	Part number			
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		2.5 V	2 V	2 V
Rated insulation voltage U_i		75 V DC	75 V DC	75 V DC
Rated operating current I_e		200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		2.5 kHz	2.5 kHz	2.5 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		Housing IP 65	Housing IP 65	IP 65
Approvals		CE	CE	CE
Material	Housing	PBT	PBT	PBT
	Sensing surface	PBT	PBT	PBT
Connection		DIN-46244- plug connector	DIN-46244- plug connector	0.2 m PUR cable with M8 connector, 3-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request





Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

Cylinder Designs

Block Designs

DC 2-wire

AC/DC 2-wire

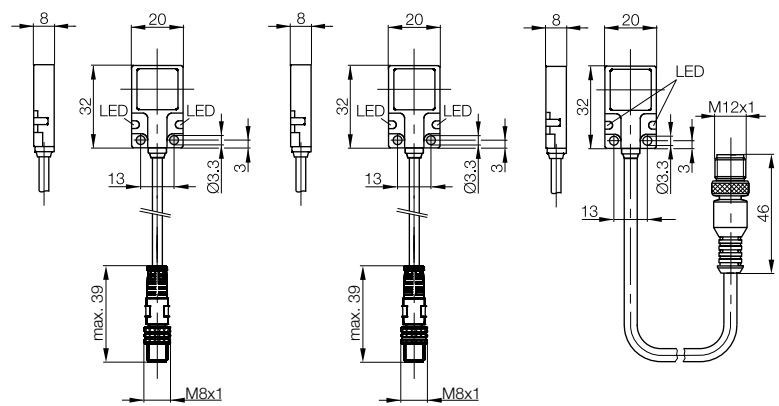
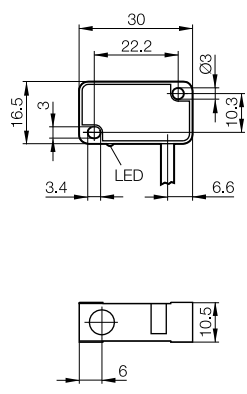
AC 2-wire

Special Properties

Analog Distance Measurement

Accessories

16×30×10 mm	20×32×8 mm R01	20×32×8 mm R01	20×32×8 mm R01
Flush	Flush	Flush	Flush
2 mm	7 mm	7 mm	7 mm
0...1.6 mm	0...5.6 mm	0...5.6 mm	0...5.6 mm
■	■	■	■
BES01N4	BES01WF	BES01WE	
BES 517-398-NO-C-02	BES R01ZC-PSC70B-BP00.3-GS49	BES R01ZC-PSC70B-BP00.2-GS49	
BES01ML			BES01W2
BES 517-351-NO-C-02			BES R01ZC-PAC70B-BP00.2-GS04
BES01NF		BES01W1	
BES 517-399-NO-C-02		BES R01ZC-NSC70B-BP00.2-GS49	
BES01MY			
BES 517-352-NO-C-02			
			BES01UZ
			BES R01ZC-NAC70B-BP00.2-GS04
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2 V	2.5 V	2.5 V	2.5 V
75 V DC	75 V DC	75 V DC	75 V DC
200 mA	200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
2.5 kHz	150 Hz	150 Hz	150 Hz
Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 65	IP 67	IP 67	IP 67
CE	CE, cULus	CE, cULus	CE, cULus
PBT	Cast zinc	Cast zinc	Cast zinc
PBT	PA 12	PA 12	PA 12
2 m PVC cable, 3×0.14 mm ²	0.3 m PUR cable with M8 connector, 3-pin	0.2 m PUR cable with M8 connector, 3-pin	0.2 m PVC cable with M12 connector, 4-pin



DC 3-/4-wire Inductive Sensors

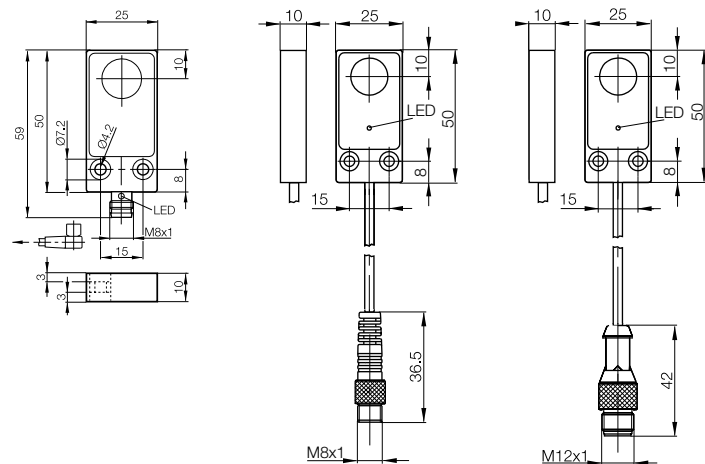
Block designs, 20×50×10 mm



Model	20×50×10 mm	20×50×10 mm	20×50×10 mm	
Installation type (observe instructions in the Basic Information chapter)	Flush	Flush	Flush	
Rated switching distance s_n	5 mm	5 mm	5 mm	
Assured switching distance s_a	0...4.1 mm	0...4.1 mm	0...4.1 mm	
Switching distance marking	■	■	■	
PNP, NO	Ordering code Part number	BES01FR BES 516-347-M0-C-S49	BES01FT BES 516-347-M0-C-S49-00,2	BES01FN BES 516-347-M0-C-S4-00,2
PNP, complementary	Ordering code Part number			BES0153 BES 516-133-M0-C-S4-00,2
Supply voltage U_s	10...30 V DC	10...30 V DC	10...30 V DC	
Voltage drop U_d at I_e max.	2.5 V	2.5 V	2.5 V	
Rated insulation voltage U_i (protection class)	75 V DC	75 V DC	75 V DC	
Rated operating current I_e	200 mA	200 mA	200 mA	
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	
Ambient temperature T_a	-25...+70 °C	-25...+70 °C	-25...+70 °C	
Switching frequency f max.	500 Hz	500 Hz	500 Hz	
Output function indicator	Yellow LED	Yellow LED	Yellow LED	
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67	
Approvals	CE, cULus	CE, cULus	CE, cULus	
Material	Housing	Cast aluminum	Cast aluminum	Cast aluminum
	Sensing surface	PBT	PBT	PBT
Connection	M8 connector, 3-pin	0.2 m PUR cable with M8 connector, 3-pin	0.2 m PUR cable with M12 connector, 4-pin	

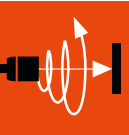
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request

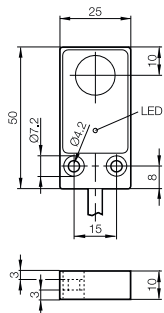




20×50×10 mm				
Flush				
5 mm				
0...4.1 mm				
■				
BES01FH				
BES 516-347-M0-C-02				
BES0179				
BES 516-133-M0-C-02				
10...30 V DC				
2.5 V				
75 V DC				
200 mA				
Yes/Yes/Yes				
-25...+70 °C				
500 Hz				
Yellow LED				
IP 67				
CE, cULus				
Cast aluminum				
PBT				
2 m PVC cable, 3×0.34 mm ²				



- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- Cylinder Designs
- Block Designs**
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- Analog Distance Measurement
- Accessories



DC 3-/4-wire Inductive Sensors

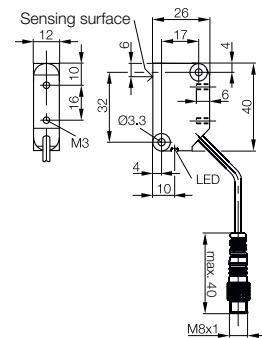
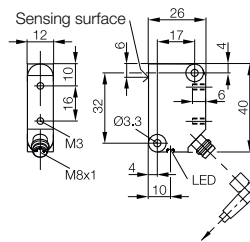
Block designs, 26×40×12 mm R05

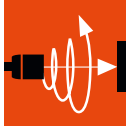


Model		26×40×12 mm R05	26×40×12 mm R05
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush
Rated switching distance s_n		2 mm	2 mm
Assured switching distance s_a		0...1.6 mm	0...1.6 mm
Switching distance marking		■	■
PNP, NO	Ordering code	BES01Z7	BES01Z3
	Part number	BES R05KB-PSC20B-S49A	BES R05KB-PSC20B-BP00,3-GS49
PNP, NC	Ordering code		
	Part number		
NPN, NO	Ordering code		
	Part number		
NPN, NC	Ordering code		
	Part number		
Supply voltage U_s		10...30 V DC	10...30 V DC
Voltage drop U_d at I_o max.		2.5 V	2.5 V
Rated insulation voltage U_i (protection class)		75 V DC	75 V DC
Rated operating current I_o		200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C
Switching frequency f max.		400 Hz	400 Hz
Output function indicator		Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67
Approvals		CE, cULus	CE, cULus
Material	Housing	PA 12	PA 12
	Sensing surface	PA 12	PA 12
Connection		M8 connector, 3-pin	0.3 m PUR cable with M8 connector, 3-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request





Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

Cylinder Designs

Block Designs

DC 2-wire

AC/DC 2-wire

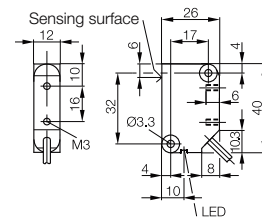
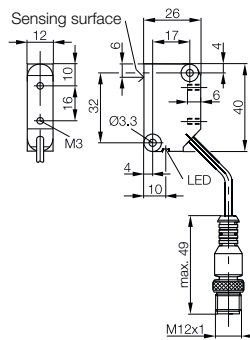
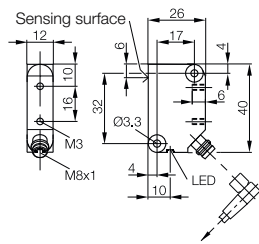
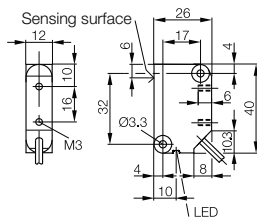
AC 2-wire

Special Properties

Analog Distance Measurement

Accessories

26×40×12 mm R05	26×40×12 mm R05	26×40×12 mm R05	26×40×12 mm R05
Flush	Flush	Flush	Flush
2 mm	4 mm	4 mm	4 mm
0...1.6 mm	0...3.2 mm	0...3.2 mm	0...3.2 mm
■	■	■	■
BES01Z4	BES01ZE	BES01Z8	BES01ZA
BES R05KB-PSC20B-EP02	BES R05KB-PSC40B-S49A	BES R05KB-PSC40B-EP00,3-GS04	BES R05KB-PSC40B-EV02
	BES01Z2		
	BES R05KB-POC40B-S49A		
	BES01Z1		
	BES R05KB-NSC40B-S49A		
			BES01YW
			BES R05KB-NOC40B-EV02
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2.5 V	2.5 V	2.5 V	2.5 V
250 V AC (□)	75 V DC	250 V AC (□)	250 V AC (□)
200 mA	200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
400 Hz	400 Hz	400 Hz	400 Hz
Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus
PA 12	PA 12	PA 12	PA 12
PA 12	PA 12	PA 12	PA 12
2 m PUR cable, 3×0.34 mm ²	M8 connector, 3-pin	0.3 m PUR cable with M12 connector, 4-pin	2 m PVC cable, 3×0.34 mm ²



DC 3-/4-wire Inductive Sensors

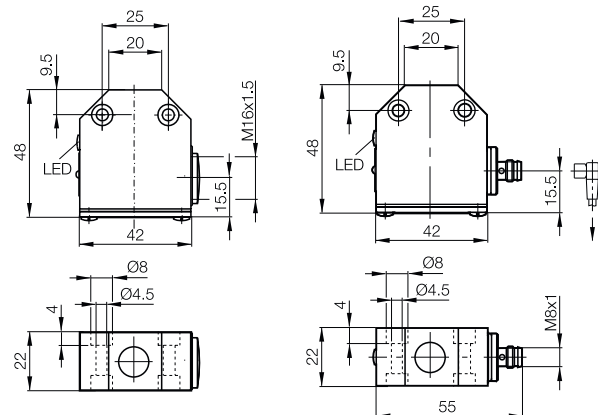
Block designs, 42x48x22 mm

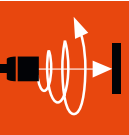


Model		42x48x22 mm	42x48x22 mm
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush
Rated switching distance s_n		5 mm	5 mm
Assured switching distance s_a		0...4.1 mm	0...4.1 mm
Switching distance marking		■	■
PNP, NO	Ordering code	BES01FC	BES01FF
	Part number	BES 516-346-H2-Y	BES 516-346-H2-Y-S49
PNP, NC	Ordering code	BES01EU	
	Part number	BES 516-341-H2-Y	
PNP, complementary	Ordering code		
	Part number		
NPN, NO	Ordering code	BES01ZK	
	Part number	BES 516-344-H2-Y	
NPN, NC	Ordering code	BES01ET	
	Part number	BES 516-340-H2-Y	
Supply voltage U_s		10...30 V DC	10...30 V DC
Voltage drop U_d at I_o max.		3.5 V	3.5 V
Rated insulation voltage U_i		75 V DC	75 V DC
Rated operating current I_o		130 mA	130 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C
Switching frequency f max.		500 Hz	500 Hz
Output function indicator		Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67
Approvals		CE	CE
Material	Housing	Cast aluminum	Cast aluminum
	Sensing surface	PA 12	PA 12
Connection		Screw terminals up to 2.5 mm ²	M8 connector, 3-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request





Inductive Sensors

Global DC 3-wire

DC 3-/4-wire
Cylinder Designs

Block Designs

DC 2-wire

AC/DC 2-wire

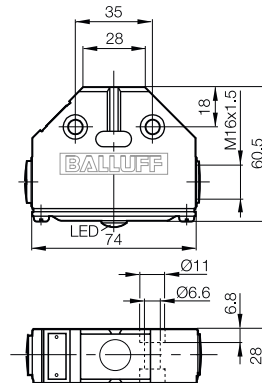
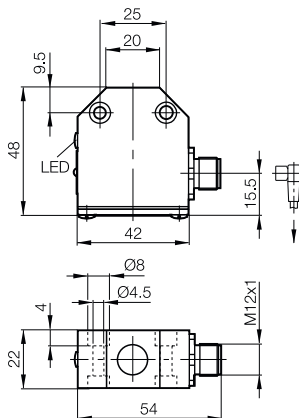
AC 2-wire

Special Properties

Analog Distance Measurement

Accessories

42×48×22 mm	74×60.5×28 mm
Flush	Flush
5 mm	7 mm
0...4.1 mm	0...5.7 mm
■	■
BES01FE	
BES 516-346-H2-Y-S4	
BES01EW	
BES 516-341-H2-Y-S4	
	BES017M
	BES 516-161-H3-L
10...30 V DC	10...30 V DC
3.5 V	1.5 V
75 V DC	75 V DC
130 mA	400 mA
Yes/Yes/Yes	Yes/No/No
-25...+70 °C	-25...+70 °C
500 Hz	300 Hz
Yellow LED	Yellow LED
IP 67	IP 67
CE	CE
Cast aluminum	Cast aluminum
PA 12	PA 12
M12 connector, 4-pin	Screw terminals up to 2.5 mm ²



Recommended short circuit protection equipment:

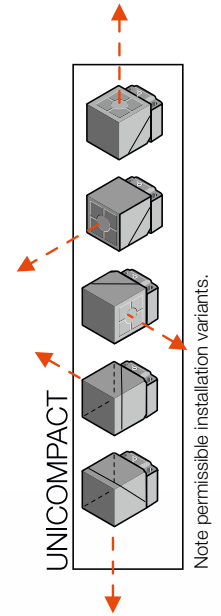
Miniature fuse in accordance with IEC60127-2 Sheet 1, ≤ 2 A (fast-acting). The fuse has to be in the load current; the fuse may not be placed in the output wiring.

DC 3-/4-wire Inductive Sensors

Block design, 40×40 mm Unicompat

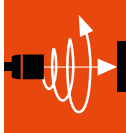
Unicompat

The Unicompat is a flexible sensor for versatile application in mechanical and systems engineering and wherever space is at a premium. The sensing surface is convertible. The connection can be rotated in all directions. With it, angle plugs are also positioned optimally at all time.



Compact sensor designs with large switching distances are required in material handling technology. In addition, the switching and operating state of the sensor must be able to be identified from far away.





Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

Cylinder Designs

Block Designs

DC 2-wire

AC/DC 2-wire

AC 2-wire

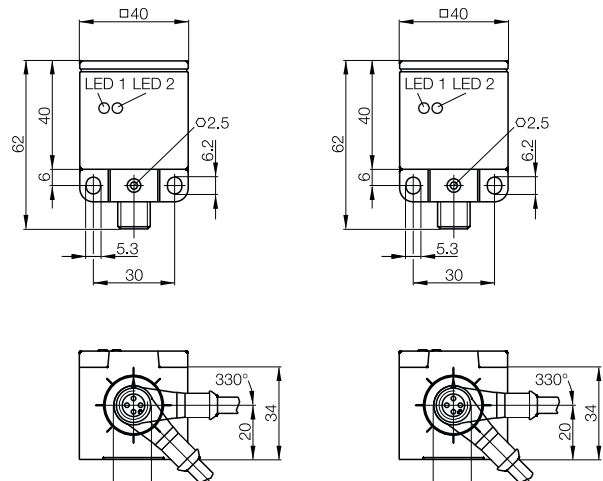
Special Properties

Analog Distance Measurement

Accessories

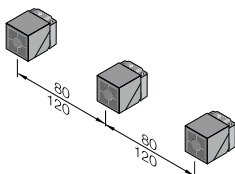
Model		40×40 mm Unicompat	40×40 mm Unicompat
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush
Rated switching distance s_n		20 mm	20 mm
Assured switching distance s_a		0...16 mm	0...16 mm
Switching distance marking		■	■
PNP, NO	Ordering code	BES021W	
	Part number	BES Q40KFU-PSC20B-S04G	
PNP, complementary	Ordering code	BES0217	BES0218
	Part number	BES Q40KFU-PAC20B-S04G	BES Q40KFU-PAC20B-S04G-004
Supply voltage U_s		10...30 V DC	10...55 V DC
Voltage drop U_d at I_e max.		2.5 V	2.5 V
Rated insulation voltage U_i (protection class)		250 V AC (□)	250 V AC (□)
Rated operating current I_e		200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C
Switching frequency f max.		50 Hz	50 Hz
Output function indicator		Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67
Approvals		CE, cULus	CE
Material	Housing	PBT	PBT
	Sensing surface	PBT	PBT
Possible installation variations		Image 1...8	Image 1...8
Connection		M12 connector, 4-pin	M12 connector, 4-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

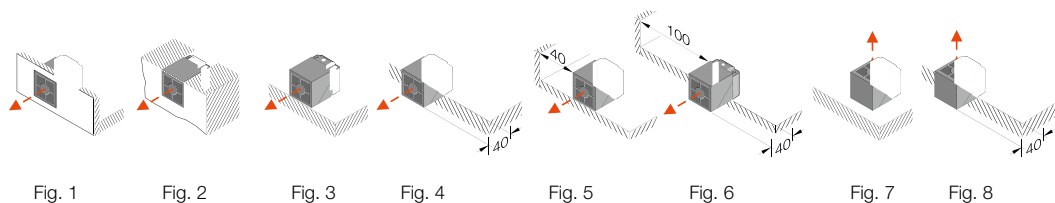


Row mounting

Flush 80 mm
Ø 120 mm non-flush



Permissible installation options



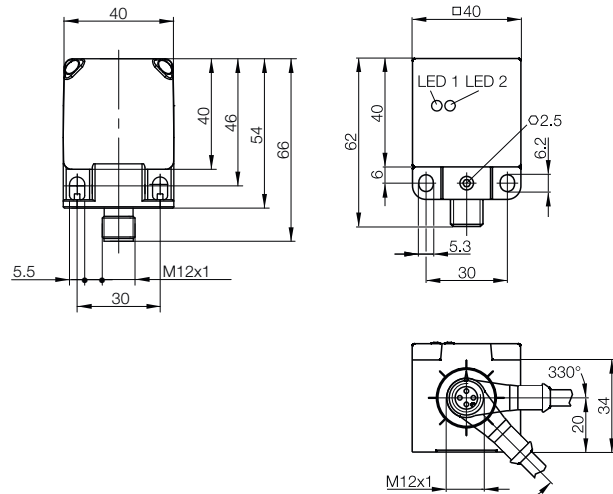
DC 3-/4-wire Inductive Sensors

Block design, 40×40 mm Unicompat



Model	40×40 mm	40×40 mm	
Installation type (observe instructions in the Basic Information chapter)	Flush	Not flush	
Rated switching distance s_n	20 mm	25 mm	
Assured switching distance s_a	0...16.2 mm	0...20 mm	
Switching distance marking	■	■	
PNP, NO	Ordering code	BES0306	
	Part number	BES Q40KFU-PSC20B-S04G-012	
PNP, complementary	Ordering code		
	Part number		
NPN, complementary	Ordering code		BES022J
	Part number		BES Q40KFU-NAC25F-S04G
Supply voltage U_s	10...30 V DC	10...30 V DC	
Voltage drop U_d at I_o max.	2.5 V	2.5 V	
Rated insulation voltage U_i (protection class)	250 V AC (□)	250 V AC (□)	
Rated operating current I_o	200 mA	200 mA	
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	
Ambient temperature T_a	-25...+70 °C	-25...+70 °C	
Switching frequency f max.	100 Hz	50 Hz	
Output function indicator	Yellow LED	Yellow LED	
Degree of protection as per IEC 60529	IP 67	IP 67	
Approvals	CE, cULus	CE, cULus	
Material	Housing Sensing surface	PA PA	PBT PBT
Possible installation variations	Image 1...8	Image 3...8	
Connection	M12 connector, 4-pin	M12 connector, 4-pin	

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.



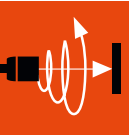
Housing optimized for material handling technology

- Highly visible corner LEDs
- Sensor head can be mounted in five positions
- Connector outlet set to position within a 270° range

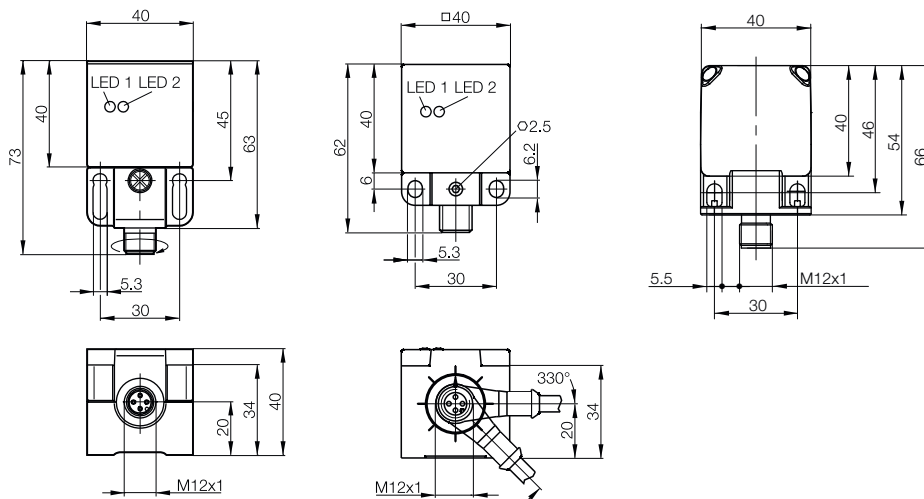




40×40 mm Not flush 25 mm 0...20 mm ■	40×40 mm Not flush 30 mm 0...24 mm ■	40×40 mm Not flush 40 mm 0...32.4 mm ■■	
	BES021Z BES Q40KFU-PSC30F-S04G	BES0308 BES Q40KFU-PSC40F-S04G-012	
BES0210 BES Q40KEU-PAH25F-S04G	BES021E BES Q40KFU-PAC30F-S04G		
10...55 V DC 2.5 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...+70 °C 50 Hz Yellow LED IP 67 CE PBT/Cast zinc PBT Image 3...8 M12 connector, 4-pin	10...30 V DC 2.5 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...+70 °C 50 Hz Yellow LED IP 67 CE, cULus PBT Image 3...8 M12 connector, 4-pin	10...30 V DC 2.5 V 250 V AC (□) 200 mA Yes/Yes/Yes -25...+70 °C 60 Hz Yellow LED IP 67 CE, cULus PA Image 3...8 M12 connector, 4-pin	



Inductive Sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder Designs
Block Designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Special Properties
Analog Distance Measurement
Accessories



The Unisensor – multiple uses

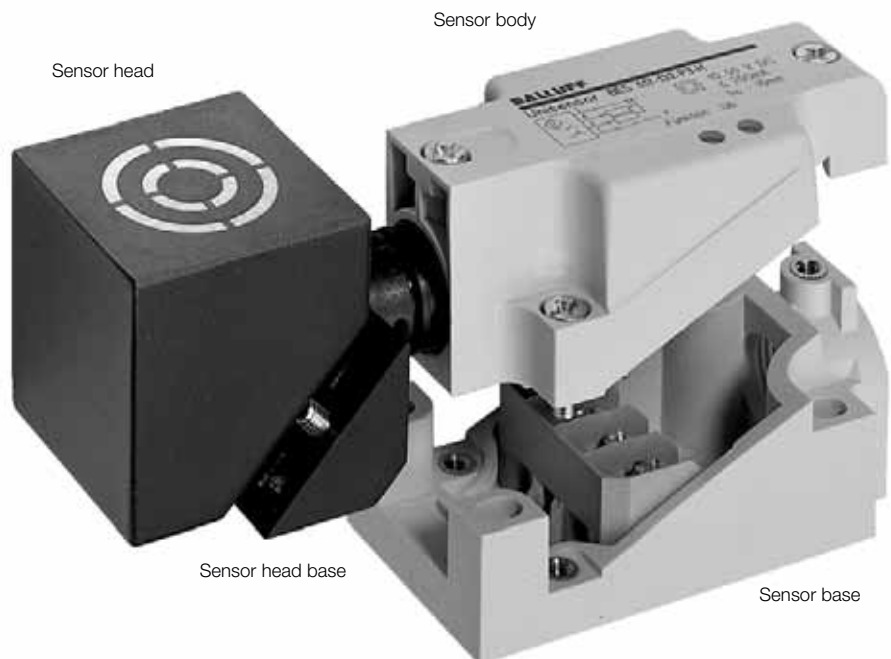
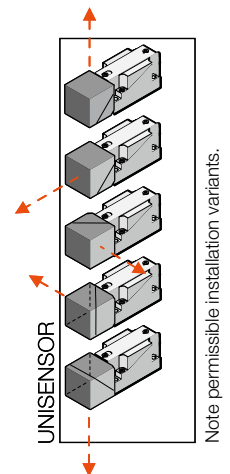
- The Unisensor is made up of three modular components: sensor head- including sensor head base), sensor body and sensor base.
- Easily removable pin contacts join sensor head- and sensor body, e.g. easy interchange of the modules without wiring.
- Sensor base with wiring terminals, self-lifting pressure plates and ample wiring room.
- Sensor head rotatable in five different positions for easy adaptation to any application (see installation drawings).
- PBT plastic housing.
- Mounting dimensions and values are based on DIN EN 60947-5-2
- LED for supply voltage and output function indicator
- Also available in special configuration for the automotive industry
- In the complementary version, output terminals 2 or 4 can be wired to configure the switch as normally closed (terminal 2) or normally open (terminal 4). By assigning both terminals, the complementary function can be used.

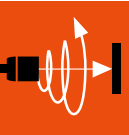
Positioning the sensor head

- Loosen the two holding screws on the sensor head.
- Rotate the sensor head 180°.
- Tighten the holding screws.

Rotate the sensor head.

- Loosen the holding screws.
- Rotate the sensor head (complete with sensor head base) into the desired position.
- Tighten the holding screws.
- Sensor head is protected against over-rotation.

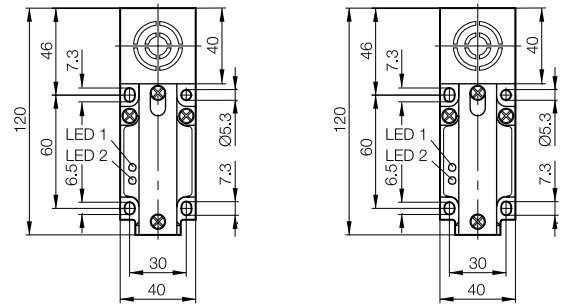




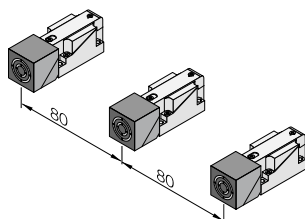
Inductive Sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder Designs
Block Designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Special Properties
Analog Distance Measurement
Accessories

Model	40×40×120 mm Unisensor	40×40×120 mm Unisensor
Installation type (observe instructions in the Basic Information chapter)	Flush	Flush
Rated switching distance s_n	15 mm	15 mm
Assured switching distance s_a	0...12 mm	0...12 mm
Switching distance marking	■	■
PNP, complementary	BES0201	BES023F
Ordering code	BES 517-132-M3-H	BES 517-132-U3-H
Part number		
Supply voltage U_s	10...55 V DC	10...55 V DC
Voltage drop U_d at I_e max.	2.5 V	2.5 V
Rated insulation voltage U_i (protection class)	250 V AC (II)	250 V AC
Rated operating current I_e	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a	-25...+70 °C	-25...+70 °C
Switching frequency f max.	100 Hz	100 Hz
Output function indicator	Yellow LED	Yellow LED
Degree of protection as per IEC 60529	IP 67	IP 67
Approvals	CE	CE
Material	PBT	PBT
Housing	PBT	PBT
Sensing surface	PBT	PBT
Possible installation variations	Image 1...5	Image 1...5
Connection	Screw terminal, metric cable gland	Screw terminal, cable gland NPT

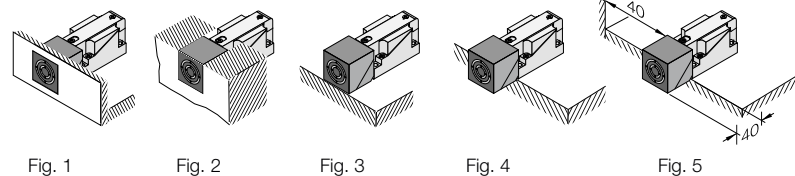
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.



Row mounting



Installation variations



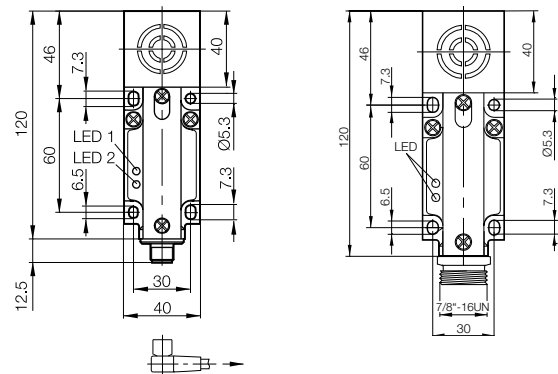
DC 3-/4-wire Inductive Sensors

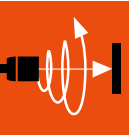
Block design, 40x40 mm Unisensor



Model		40x40x120 mm Unisensor	40x40x120 mm Unisensor
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush
Rated switching distance s_n		15 mm	15 mm
Assured switching distance s_a		0...12 mm	0...12 mm
Switching distance marking		■	■
PNP, complementary	Ordering code	BES0202	BES023J
	Part number	BES 517-132-M3-H-S4	BES 517-132-U3-H-S5
NPN, complementary	Ordering code	BES020H	
	Part number	BES 517-134-M3-H-S4	
Supply voltage U_s		10...55 V DC	10...55 V DC
Voltage drop U_d at I_e max.		2.5 V	2.5 V
Rated insulation voltage U_i (protection class)		250 V AC (II)	250 V AC
Rated operating current I_e		200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C
Switching frequency f max.		100 Hz	100 Hz
Output function indicator		Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67
Approvals		CE, cULus	CE
Material	Housing	PBT	PBT
	Sensing surface	PBT	PBT
Possible installation variations		Image 1...5	Image 1...5
Connection		M12 connector, 4-pin	7/8" 16UN plug connector, 5-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.





Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

Cylinder Designs

Block Designs

DC 2-wire

AC/DC 2-wire

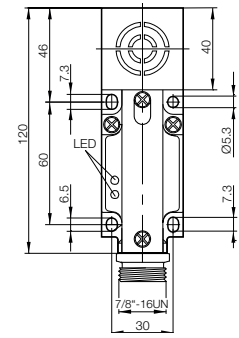
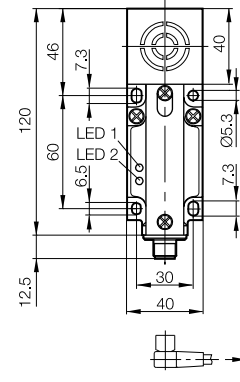
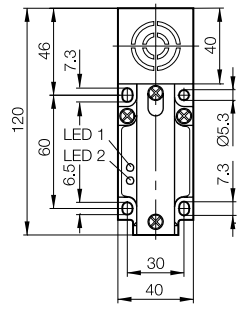
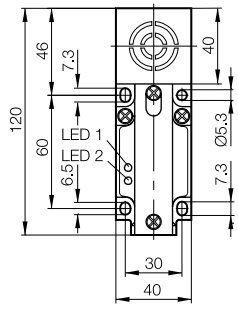
AC 2-wire

Special Properties

Analog Distance Measurement

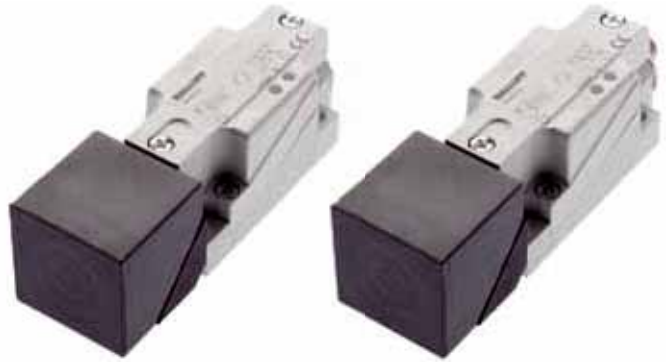
Accessories

40×40×120 mm Unisensor	40×40×120 mm Unisensor	40×40×120 mm Unisensor	40×40×120 mm Unisensor
Flush	Flush	Flush	Flush
20 mm	20 mm	20 mm	20 mm
0...16 mm	0...16 mm	0...16 mm	0...16 mm
■	■	■	■
BES0209	BES023L	BES020A	
BES 517-132-M6-H	BES 517-132-U6-H	BES 517-132-M6-H-S4	
BES020M		BES020N	BES020P
BES 517-134-M6-H		BES 517-134-M6-H-S4	BES 517-134-M6-H-S5
10...55 V DC	10...55 V DC	10...55 V DC	10...55 V DC
2.5 V	2.5 V	2.5 V	2.5 V
250 V AC (□)	250 V AC (□)	250 V AC (□)	250 V AC (□)
200 mA	200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
50 Hz	50 Hz	50 Hz	50 Hz
Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67
CE	CE	CE	CE
PBT	PBT/aluminum	PBT	PBT
PBT	PBT	PBT	PBT
Image 1...5	Image 1...5	Image 1...5	Image 1...5
Screw terminal, metric cable gland	Screw terminal, cable gland NPT	M12 connector, 4-pin	7/8" 16UN plug connector, 5-pin



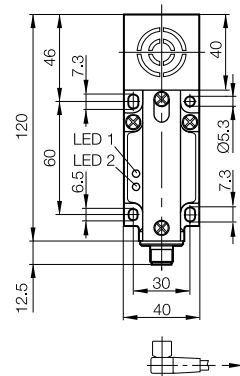
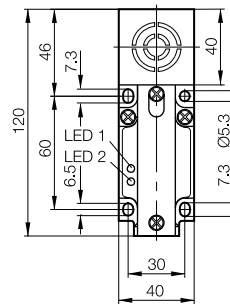
DC 3-/4-wire Inductive Sensors

Block design, 40x40 mm Unisensor



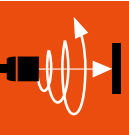
Model		40x40x120 mm Unisensor	40x40x120 mm Unisensor
Installation type (observe instructions in the Basic Information chapter)		Not flush	Not flush
Rated switching distance s_n		20 mm	20 mm
Assured switching distance s_a		0...16 mm	0...16 mm
Switching distance marking		■	■
PNP, NO	Ordering code		
	Part number		
PNP, complementary	Ordering code	BES0204	BES0205
	Part number	BES 517-132-M4-H	BES 517-132-M4-H-S4
NPN, complementary	Ordering code	BES020J	
	Part number	BES 517-134-M4-H	
Supply voltage U_s		10...55 V DC	10...55 V DC
Voltage drop U_d at I_e max.		2.5 V	2.5 V
Rated insulation voltage U_i (protection class)		250 V AC (□)	250 V AC (□)
Rated operating current I_e		200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C
Switching frequency f max.		100 Hz	100 Hz
Output function indicator		Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67
Approvals		CE	CE
Material	Housing	PBT	PBT
	Sensing surface	PBT	PBT
Possible installation variations		Image 3...5	Image 3...5
Connection		Screw terminal, metric cable gland	M12 connector, 4-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.





40×40×120 mm Unisensor	40×40×120 mm Unisensor	40×40×120 mm Unisensor	
Not flush	Not flush	Not flush	
25 mm	25 mm	25 mm	
0...20 mm	0...20 mm	0...20 mm	
■	■	■	
BES0235	BES0236		
BES 517-385-MV-C	BES 517-385-V-C-S4		
		BES0312	
		BES 517-134-U4-H-S5	
10...30 V DC	10...30 V DC	10...55 V DC	
3.5 V	3.5 V	2.5 V	
250 V AC (□)	250 V AC (□)	250 V AC (□)	
200 mA	200 mA	200 mA	
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	
-25...+70 °C	-25...+70 °C	-25...+70 °C	
50 Hz	50 Hz	100 Hz	
Yellow LED	Yellow LED	Yellow LED	
IP 67	IP 67	IP 67	
CE	CE	CE, cULus	
PBT	PBT	PBT	
PBT	PBT	PBT	
Image 3...5	Image 3...5	Image 3...5	
Screw terminal, metric cable gland	M12 connector, 4-pin	7/8" 16UN plug connector, 5-pin	



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

Cylinder Designs

Block Designs

DC 2-wire

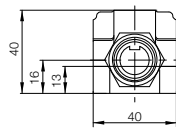
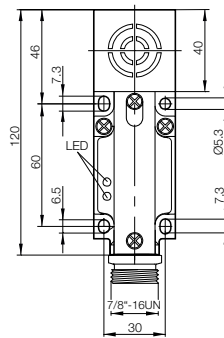
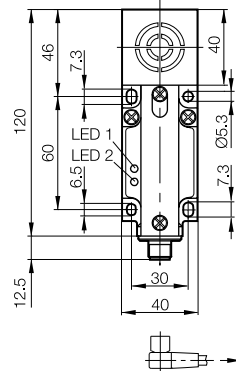
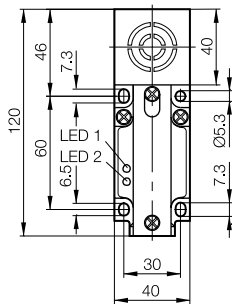
AC/DC 2-wire

AC 2-wire

Special Properties

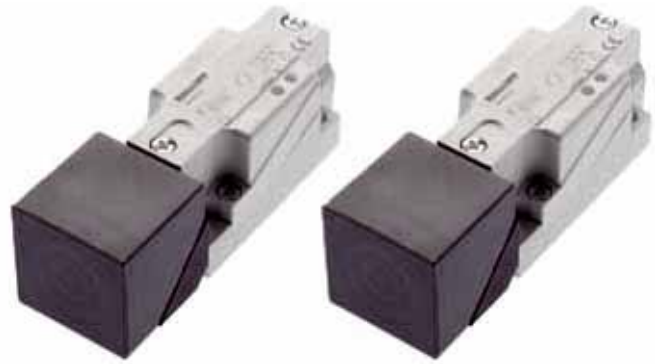
Analog Distance Measurement

Accessories



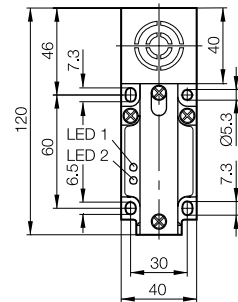
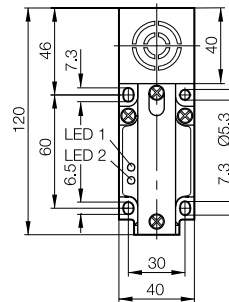
DC 3-/4-wire Inductive Sensors

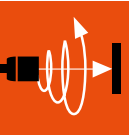
Block design, 40x40 mm Unisensor



Model		40x40x120 mm Unisensor	40x40x120 mm Unisensor	
Installation type (observe instructions in the Basic Information chapter)		Not flush	Not flush	
Rated switching distance s_n		30 mm	30 mm	
Assured switching distance s_a		0...24 mm	0...24 mm	
Switching distance marking		■	■	
PNP, NO	Ordering code	BES0206		
	Part number	BES 517-132-M5-H		
PNP, complementary	Ordering code			
	Part number			
NPN, complementary	Ordering code	BES020K	BES023N	
	Part number	BES 517-134-M5-H	BES 517-134-U5-H	
Supply voltage U_s		10...55 V DC	10...55 V DC	
Voltage drop U_d at I_e max.		2.5 V	2.5 V	
Rated insulation voltage U_i (protection class)		250 V AC (□)	250 V AC (□)	
Rated operating current I_e		200 mA	200 mA	
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	
Switching frequency f max.		60 Hz	60 Hz	
Output function indicator		Yellow LED	Yellow LED	
Degree of protection as per IEC 60529		IP 67	IP 67	
Approvals		CE	CE	
Material	Housing	PBT	PBT/aluminum	
	Sensing surface	PBT	PBT	
Possible installation variations		Image 3...5	Image 3...5	
Connection		Screw terminal, metric cable gland	Screw terminal, cable gland NPT	

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.





Inductive Sensors

Global DC 3-wire

DC 3-/4-wire
Cylinder Designs

Block Designs

DC 2-wire

AC/DC 2-wire

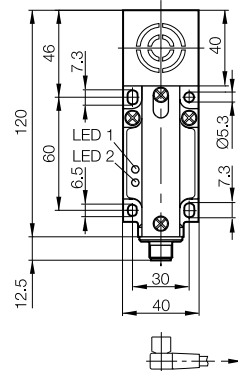
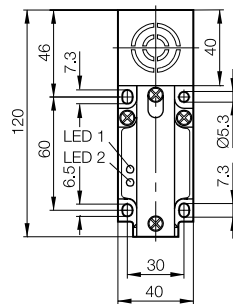
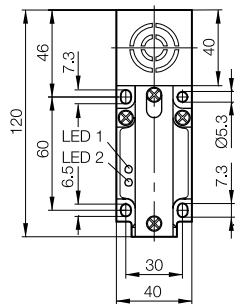
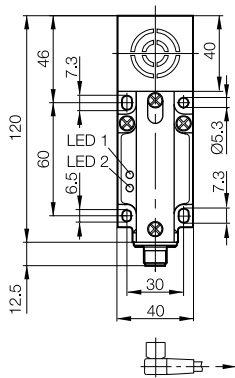
AC 2-wire

Special Properties

Analog Distance Measurement

Accessories

40×40×120 mm Unisensor	40×40×120 mm Unisensor	40×40×120 mm Unisensor	40×40×120 mm Unisensor
Not flush	Not flush	Not flush	Not flush
30 mm	40 mm	40 mm	40 mm
0...24 mm	0...32 mm	0...32 mm	0...32 mm
■	■	■	■
BES0207	BES020C	BES023M	BES020E
BES 517-132-M5-H-S4	BES 517-132-M7-H	BES 517-132-U7-H	BES 517-132-M7-H-S4
10...55 V DC	10...55 V DC	10...55 V DC	10...55 V DC
2.5 V	2.5 V	2.5 V	2.5 V
250 V AC (□)	250 V AC (□)	250 V AC (□)	250 V AC (□)
200 mA	200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
60 Hz	50 Hz	50 Hz	50 Hz
Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67
CE	CE	CE	CE
PBT	PBT	PBT/aluminum	PBT
PBT	PBT	PBT	PBT
Image 3...5	Image 3...5	Image 3...5	Image 3...5
M12 connector, 4-pin	Screw terminal, metric cable gland	Screw terminal, cable gland NPT	M12 connector, 4-pin



Flush mount

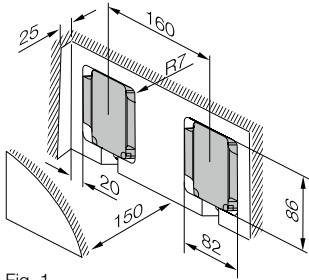


Fig. 1

Non-flush mount

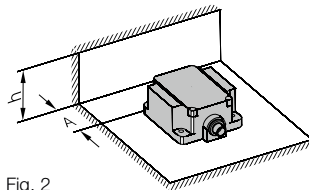


Fig. 2

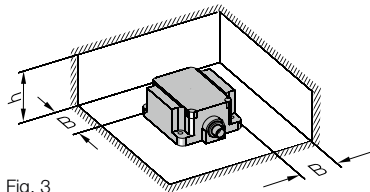


Fig. 3

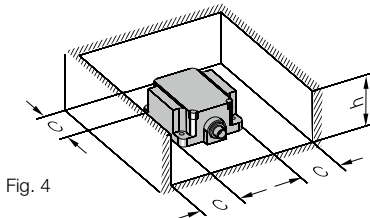


Fig. 4

Minimum distances with steel

h	A	B	C
40 mm	70 mm	80 mm	90 mm
70 mm	80 mm	90 mm	100 mm

Minimum distances with aluminum

h	A	B	C
40 mm	0 mm	10 mm	10 mm
70 mm	10 mm	20 mm	20 mm

The change of the real switching distance s_r is $\leq 10\%$ with these installation dimensions.

Mounting in steel

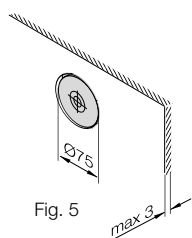


Fig. 5

Mounting in non-ferrous metals

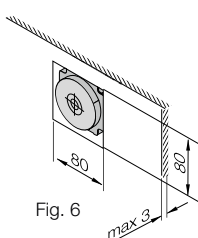


Fig. 6

Mounting in steel/non-ferrous metals

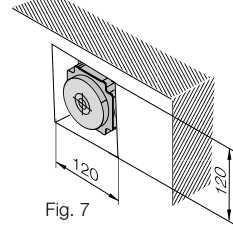


Fig. 7

Mounting on steel/non-ferrous metals

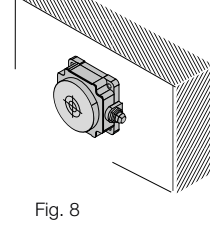
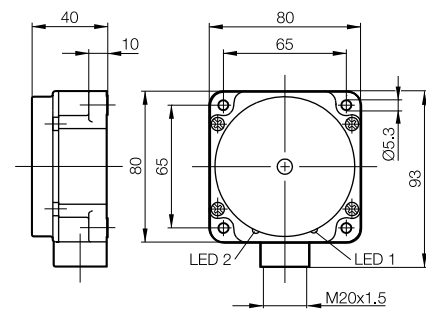


Fig. 8



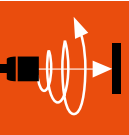
Model	80×80×40 mm Maxisensor	
Installation type (observe instructions in the Basic Information chapter)	Flush	
Rated switching distance s_n	40 mm	
Assured switching distance s_a	0...32 mm	
Switching distance marking	■	
PNP, NO	Ordering code	
	Part number	
PNP, complementary	Ordering code	BES023P
	Part number	BES 517-139-M4-H
NPN, complementary	Ordering code	
	Part number	
Supply voltage U_s	10...55 V DC	
Voltage drop U_d at I_e max.	2.5 V	
Rated insulation voltage U_i (protection class)	250 V AC (II)	
Rated operating current I_e	200 mA	
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	
Ambient temperature T_a	-15...+70 °C	
Switching frequency f max.	50 Hz	
Output function indicator	Yellow LED	
Degree of protection as per IEC 60529	IP 67	
Approvals	CE	
Material	Housing	PBT
	Sensing surface	PBT
Possible installation variations	Image 5...8	
Connection	Screw terminal, metric cable gland	

Wiring diagrams, see page 958.
Switching distance markings can be found on page 962.





80×80×40 mm Maxisensor	80×84×40 mm Maxisensor	80×80×40 mm Maxisensor
Flush	Flush	Flush
40 mm	40 mm	40 mm
0...32 mm	0...32 mm	0...32 mm
■	■	■
	BES0227	
	BES Q80KA-PSH40B-S04Q	
	BES0225	
	BES Q80KA-PAH40B-S04Q	
BES020R		BES020T
BES 517-140-M4-H		BES 517-140-M4-H-S4
10...55 V DC	10...55 V DC	10...55 V DC
2.5 V	2.5 V	2.5 V
250 V AC (□)	250 V AC (□)	250 V AC (□)
200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C
50 Hz	50 Hz	50 Hz
Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67
CE	CE	CE
PBT	PBT	PBT
PBT	PBT	PBT
Image 5...8	Fig. 1	Image 5...8
Screw terminal, metric cable gland	M12 connector, 4-pin	M12 connector, 4-pin



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

Cylinder Designs

Block Designs

DC 2-wire

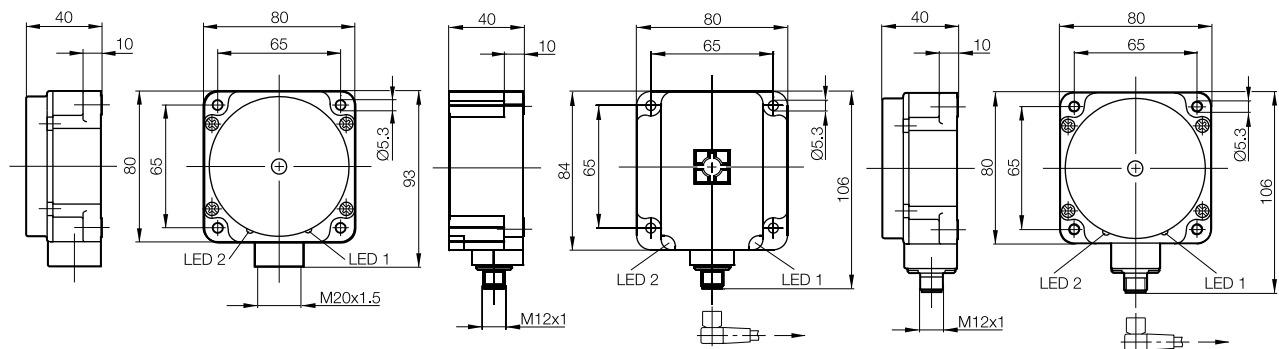
AC/DC 2-wire

AC 2-wire

Special Properties

Analog Distance Measurement

Accessories



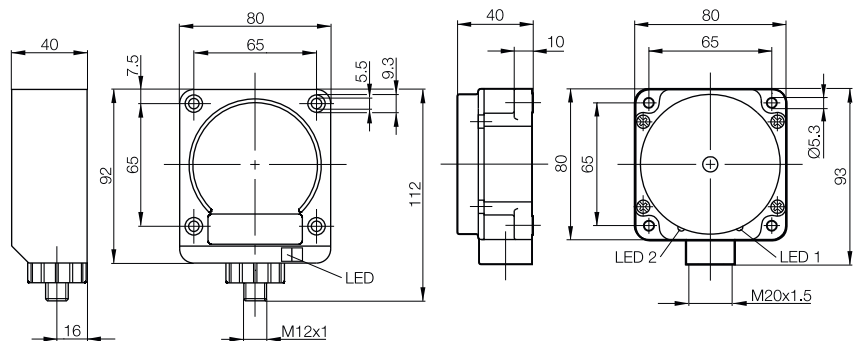
DC 3-/4-wire Inductive Sensors

Block design, 80×80 mm Maxisensor



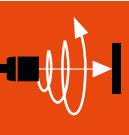
Model		80×92×40 mm Maxisensor	80×80×40 mm Maxisensor
Installation type (observe instructions in the Basic Information chapter)		Flush	Not flush
Rated switching distance s_n		50 mm	50 mm
Assured switching distance s_a		0...40.5 mm	0...40 mm
Switching distance marking		■	■
PNP, NO	Ordering code		
	Part number		
PNP, complementary	Ordering code	BES030C	BES023R
	Part number	BES Q80KA-PAC50B-S04Q-U	BES 517-139-M5-H
NPN, complementary	Ordering code		BES020U
	Part number		BES 517-140-M5-H
Supply voltage U_s		10...36 V DC	10...55 V DC
Voltage drop U_d at I_e max.		2.5 V	2.5 V
Rated insulation voltage U_i (protection class)		250 V AC (□)	250 V AC (□)
Rated operating current I_e		250 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...70 °C	-25...70 °C
Switching frequency f max.		70 Hz	100 Hz
Output function indicator		Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67
Approvals		CE, cULus	CE
Material	Housing	PPE	PBT
	Sensing surface	PPE	PBT
Possible installation variations			Image 7, 8
Connection		M12 connector, 4-pin	Screw terminal, metric cable gland

Wiring diagrams, see page 958.
Switching distance markings can be found on page 962.





80×80×40 mm Maxisensor	80×80×40 mm Maxisensor	80×84×40 mm Maxisensor
Not flush	Not flush	Not flush
50 mm	50 mm	50 mm
0...40 mm	0...40 mm	0...40 mm
■	■	■
	BES023W	BES0228
	BES 517-139-U5-H-S4	BES Q80KA-PSH50F-S04Q
		BES0226
		BES Q80KA-PAH50F-S04Q
BES020W		
BES 517-140-M5-H-S4		
10...55 V DC	10...55 V DC	10...55 V DC
2.5 V	2.5 V	2.5 V
250 V AC (□)	250 V AC (□)	250 V AC (□)
200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...70 °C	-25...70 °C	-25...+70 °C
100 Hz	100 Hz	50 Hz
Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67
CE	CE, cULus	CE
PBT	PBT	PBT
PBT	PBT	PBT
Image 7, 8	Image 7, 8	Image 2...4
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

Cylinder Designs

Block Designs

DC 2-wire

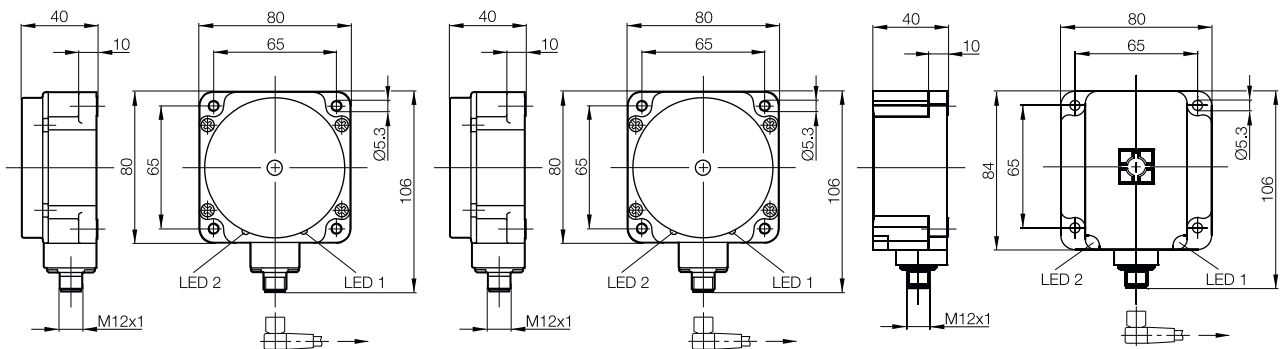
AC/DC 2-wire

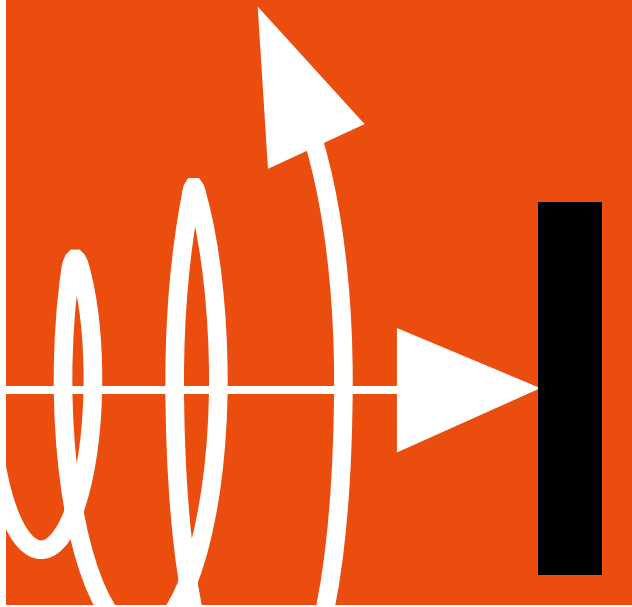
AC 2-wire

Special Properties

Analog Distance Measurement

Accessories





Inductive Sensors

DC 2-wire Inductive Sensors

Our **standard line of 2-wire DC versions**. This extensive line includes sensors from M8 to M30 as well as block designs for practically every application in automation.

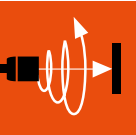


Cylinder Designs

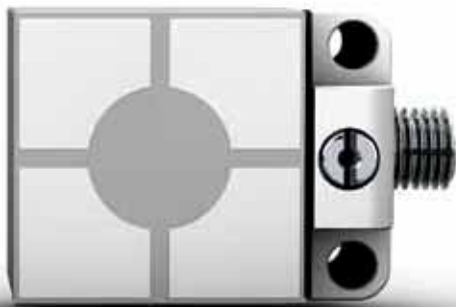
M8×1	571
M12×1	574
M18×1	576
M30×1.5	579

Block Designs

20×32×8 mm (R01)	582
26×26×26 mm (Z03)	583
40×66×40 mm (Unicompact)	584
40×121×40 mm (Unisensor)	585
80×92×40 mm (Maxisensor)	586



Basic information and definitions can be found on **page 934**.



DC 2-wire sensors can be used universally: They can be used in conjunction with most PNP or NPN controllers. Use of these sensors enables a reduction in the number of inventoried part numbers. Suitability of the 2-wire sensors for the respective PNP or NPN controller should be tested in advance.



Global: The complete series of standard sensors

Inductive standard sensors are mostly available ex warehouse, can be used around the world and meet worldwide standards. They offer an optimal price/performance ratio.

- Short and mid-size designs Ø 6.5 mm to M30×1.5
- Shielded and unshielded designs
- Cable and connector versions
- Standard and extended switching distance



Model	
Installation type (observe instructions in the Basic Information chapter)	
Rated switching distance s_n	
Assured switching distance s_a	
Switching distance marking	
Polarized, NO	Ordering code
	Part number
Polarized, NC	Ordering code
	Part number
Non-polarized, NO	Ordering code
	Part number
Non-polarized, NC	Ordering code
	Part number
Supply voltage U_S	
Voltage drop U_d at I_o max.	
Rated insulation voltage U_i	
Rated operating current I_o	
Minimum operating current I_m	
Residual current I_r max.	
Permissible load capacitance max.	
Polarity reversal protected/transposition protected/short-circuit protected	
Ambient temperature T_a	
Switching frequency f max.	
Output function indicator	
Degree of protection as per IEC 60529	
Approvals	
Material	Housing
	Sensing surface
Connection	

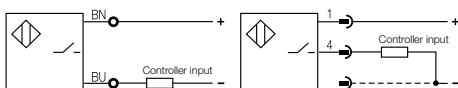
Wiring diagrams, see page 958.

The meaning of switching distance markings can be found on page 962.

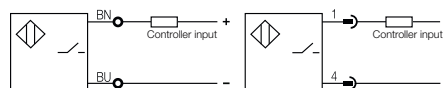
Additional cable lengths on request.

Recommendation for connection wiring for polarized sensors on 3-wire controllers

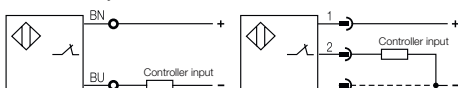
PNP, NO



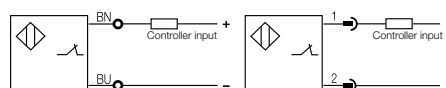
NPN, NO



PNP, normally closed



NPN, NC



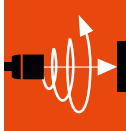


Global



Global

M8x1	M8x1	M8x1	M8x1
Flush	Flush	Flush	Flush
2 mm	2 mm	1.5 mm	2 mm
0...1.6 mm	0...1.6 mm	0...1.2 mm	0...1.6 mm
■ ■	■ ■	■	■ ■
BES0022			BES001Z
BES M08ME1-GSC20B-S04G			BES M08MG-GSC20B-BP00,3-GS04
BES024N			BES03H8
BES M08ME1-GOC20B-S04G			BES M08MG-GOC20B-BP00,3-GS04
BES001Y	BES03KP		
BES M08ME1-USC20B-S04G	BES M08ME1-USH20B-S04G		
BES024P		BES031N	
BES M08ME1-UOC20B-S04G		BES 516-527-S4-H	
10...36 V DC	10...55 V DC	10...55 V DC	10...36 V DC
5 V	5 V	5 V	5 V
75 V DC	75 V DC	75 V DC	75 V DC
100 mA	100 mA	130 mA	100 mA
5 mA	5 mA	5 mA	5 mA
600 µA	600 µA	500 µA	600 µA
1 µF	1 µF	1 µF	1 µF
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
1.5 kHz	1.5 kHz	3 kHz	1.5 kHz
Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67
CE, cULus	CE	CE, cULus	CE, cULus
Brass-coated	Brass-coated	Stainless steel	Brass-coated
PBT	PBT	PBT	PBT
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

Cylinder Designs

Block Designs

AC/DC 2-wire

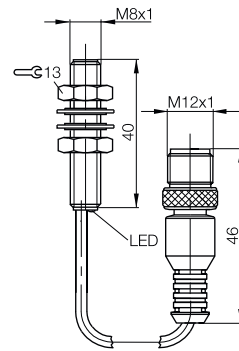
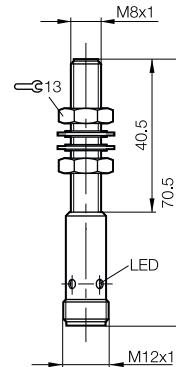
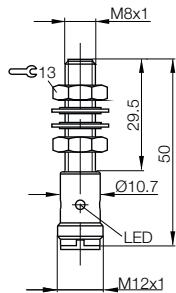
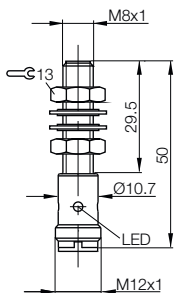
AC 2-wire

Special Properties

Properties

Analog Distance Measurement

Accessories

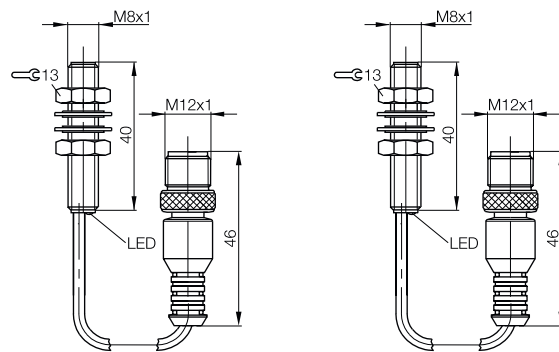




Model		M8x1	M8x1
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush
Rated switching distance s_n		2 mm	2 mm
Assured switching distance s_a		0...1.6 mm	0...1.4 mm
Switching distance marking		■■	■■
Polarized, NO	Ordering code	BES03KR	BES0324
	Part number	BES M08MG-GSH20B-BP00,3-GS04	BES M08MG-GSC20B-BP00,3-GS04-101
Polarized, NC	Ordering code		
	Part number		
Non-polarized, NO	Ordering code		
	Part number		
Non-polarized, NC	Ordering code		
	Part number		
Supply voltage U_s		10...55 V DC	10...30 V DC
Voltage drop U_d at I_o max.		5 V	5 V
Rated insulation voltage U_i		75 V DC	75 V DC
Rated operating current I_o		100 mA	100 mA
Minimum operating current I_m		5 mA	5 mA
Residual current I_r max.		600 μ A	600 μ A
Permissible load capacitance max.		1 μ F	1 μ F
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C
Switching frequency f max.		1.5 kHz	1.5 kHz
Output function indicator		Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67
Approvals		CE	CE, cULus
Material	Housing	Brass-coated	Brass-coated
	Sensing surface	PBT	With ceramic coating
Connection		0.3 m PUR cable with M12 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request.

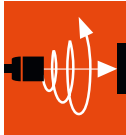




Global



M8x1	M8x1		
Flush	Flush		
2 mm	2 mm		
0...1.6 mm	0...1.6 mm		
■ ■	■ ■		
BES001L			
BES M08MG-GSC20B-BV02			
BES024R			
BES M08MG-GOC20B-BV02			
BES001T	BES03KT		
BES M08MG-USC20B-BV02	BES M08MG-USH20B-BV02		
BES024T			
BES M08MG-UOC20B-BV02			
10...36 V DC	10...55 V DC		
5 V	5 V		
75 V DC	75 V DC		
100 mA	100 mA		
5 mA	5 mA		
600 µA	600 µA		
1 µF	1 µF		
Yes/Yes/Yes	Yes/Yes/Yes		
-25...+70 °C	-25...+70 °C		
1.5 kHz	1.5 kHz		
Yellow LED	Yellow LED		
IP 67	IP 67		
CE, cULus	CE		
Brass-coated	Brass-coated		
PBT	PBT		
2 m PVC cable, 2x0.14 mm ²	2 m PVC cable, 2x0.14 mm ²		



Inductive
Sensors

Global
DC 3-wire

DC 3-/4-wire

DC 2-wire
**Cylinder
Designs**

Block Designs

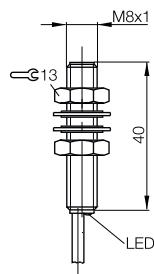
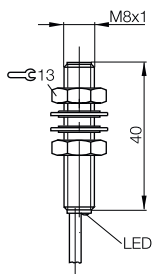
AC/DC 2-wire

AC 2-wire

Special
Properties

Analog
Distance
Measurement

Accessories





Global

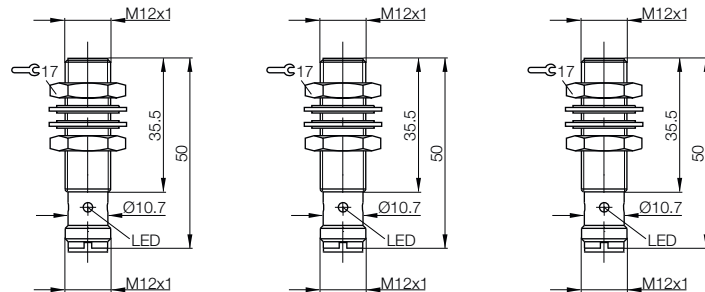


Model		M12x1	M12x1	M12x1	
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush	
Rated switching distance s_n		3 mm	3 mm	3 mm	
Assured switching distance s_a		0...2.4 mm	0...2.2 mm	0...2.4 mm	
Switching distance marking		■ ■	■ ■	■ ■	
Polarized, NO	Ordering code	BES003Z	BES00C1		
	Part number	BES M12MF-GSC30B-S04G	BES M12MF-GSC30B-S04G-101		
Polarized, NC	Ordering code	BES024J			
	Part number	BES M12MF-GOC30B-S04G			
Non-polarized, NO	Ordering code	BES0041		BES03KU	
	Part number	BES M12MF-USC30B-S04G		BES M12MF-USH30B-S04G	
Non-polarized, NC	Ordering code	BES024K			
	Part number	BES M12MF-UOC30B-S04G			
Supply voltage U_s		10...36 V DC	10...30 V DC	10...55 V DC	
Voltage drop U_d at I_o max.		≤ 5 V	5 V	5 V	
Rated insulation voltage U_i (protection class)		75 V DC	75 V DC	75 V DC	
Rated operating current I_o		100 mA	100 mA	100 mA	
Minimum operating current I_m		5 mA	5 mA	5 mA	
Residual current I_r max.		600 μ A	600 μ A	600 μ A	
Permissible load capacitance max.		1 μ F	1 μ F	1 μ F	
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C	
Switching frequency f max.		1.3 kHz	1.5 kHz	1.3 kHz	
Output function indicator		Yellow LED	Yellow LED	Yellow LED	
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67	
Approvals		CE, cULus	CE, cULus	CE	
Material	Housing	Brass-coated	Brass-coated	Brass-coated	
	Sensing surface	PA 12	With ceramic coating	PA 12	
Connection		M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	

Wiring diagrams, see page 958.

The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request.





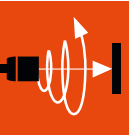
Global



Global



M12x1	M12x1	M12x1	M12x1	M12x1
Flush	Flush	Flush	Flush	Flush
3 mm	3 mm	3 mm	3 mm	3 mm
0...2.4 mm	0...2.2 mm	0...2.4 mm	0...2.4 mm	0...2.4 mm
■ ■	■ ■	■ ■	■ ■	■ ■
BES0042	BES0326	BES03KW	BES0045	
BES M12MG-GSC30B-BP00,3-GS04	BES M12MG-GSC30B-BP00,3-GS04-101	BES M12MG-GSH30B-BP00,3-GS04	BES M12MG-GSC30B-BV02	
BES03HK			BES024L	
BES M12MG-GOC30B-BP00,3-GS04			BES M12MG-GOC30B-BV02	
			BES004T	BES03KN
			BES M12MG-USC30B-BV02	BES M12MG-USH30B-BV02
			BES024M	
			BES M12MG-UOC30B-BV02	
10...36 V DC	10...30 V DC	10...55 V DC	10...36 V DC	10...55 V DC
4 V	4 V	4 V	≤ 5 V	5 V
75 V DC	75 V DC	75 V DC	75 V DC	75 V DC
100 mA	100 mA	100 mA	100 mA	100 mA
5 mA	5 mA	5 mA	5 mA	5 mA
600 µA	600 µA	600 µA	600 µA	600 µA
1 µF	1 µF	1 µF	1 µF	1 µF
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
1.3 kHz	1.3 kHz	1.3 kHz	1.3 kHz	1.3 kHz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE	CE, cULus	CE
Brass-coated	Brass-coated	Brass-coated	Brass-coated	Brass-coated
PA 12	With ceramic coating	PA 12	PA 12	PA 12
0.3 m PUR cable with M12 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin	2 m PVC cable, 2x0.34 mm ²	2 m PVC cable, 2x0.34 mm ²



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

Cylinder Designs

Block Designs

AC/DC 2-wire

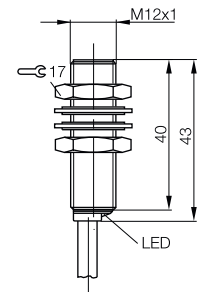
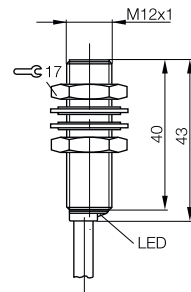
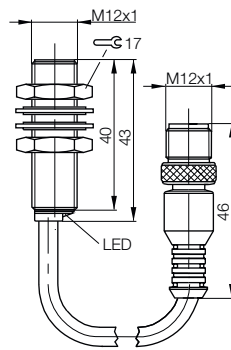
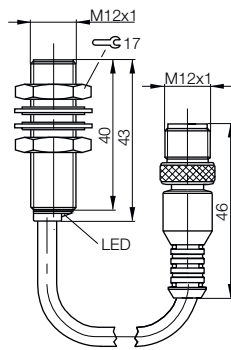
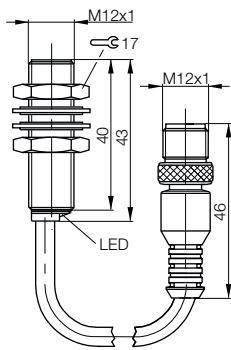
AC 2-wire

Special Properties

Properties

Analog Distance Measurement

Accessories

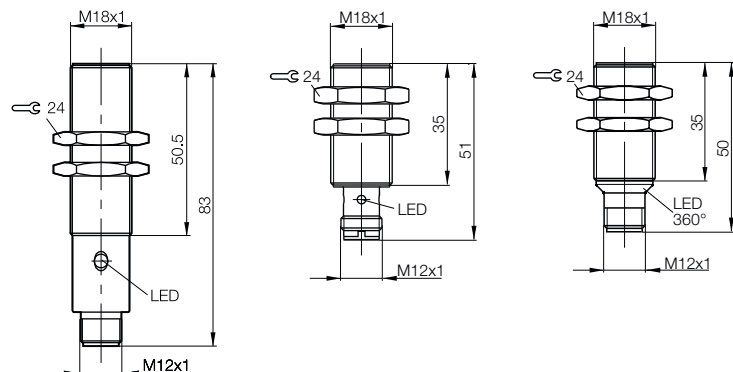




Model	M18x1	M18x1	M18x1	
Installation type (observe instructions in the Basic Information chapter)	Flush	Flush	Flush	
Rated switching distance s_n	5 mm	7 mm	7 mm	
Assured switching distance s_a	0...4 mm	0...5.6 mm	0...5.6 mm	
Switching distance marking	■	■■	■■■	
Polarized, NO	Ordering code	BES0328		
	Part number	BES M18MF-GSC70B-S04G		
Polarized, NC	Ordering code	BES02NL		
	Part number	BES M18MF-GOC70B-S04G		
Non-polarized, NO	Ordering code	BES02NR	BES039M	
	Part number	BES M18MF-USC70B-S04G	BES M18MF-USH70B-S04K	
Non-polarized, NC	Ordering code	BES02NN		
	Part number	BES M18MF-UOC70B-S04G		
Supply voltage U_s	10...55 V DC	10...36 V DC	10...55 V DC	
Voltage drop U_d at I_o max.	5 V	≤ 5 V	5 V	
Rated insulation voltage U_i	250 V AC (□)	75 V DC	75 V DC	
Rated operating current I_o	200 mA	100 mA	100 mA	
Minimum operating current I_m	5 mA	5 mA	5 mA	
Residual current I_r max.	500 μ A	600 μ A	600 μ A	
Permissible load capacitance max.	1 μ F	1 μ F	1 μ F	
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	
Ambient temperature T_a	-25...+70 °C	-25...+70 °C	-25...+70 °C	
Switching frequency f max.	250 Hz	600 Hz	600 Hz	
Output function indicator	Yellow LED	Yellow LED	Yellow LED	
Degree of protection as per IEC 60529	IP 68 per BWN Pr. 20	IP 67	IP 67	
Approvals	CE, cULus	CE, cULus	CE	
Material	Housing Sensing surface	Brass-coated PA 12	Brass-coated PA 12	Brass-coated PA 12
Connection	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request.



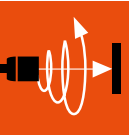


Global



Global

M18x1	M18x1	M18x1	M18x1
Flush	Flush	Flush	Flush
7 mm	7 mm	7 mm	7 mm
0...5.6 mm	0...5.5 mm	0...5.6 mm	0...5.6 mm
■ ■	■ ■	■ ■	■ ■
BES006C	BES0329	BES039P	BES00FA
BES M18MG-GSC70B-BP00,3-GS04	BES M18MG-GSC70B-BP00,3-GS04-101	BES M18MG-GSH70B-BP00,3-GS04	BES M18MG-GSC70B-BV02
BES039L			BES02NT
BES M18MG-GOC70B-BP00,3-GS04			BES M18MG-GOC70B-BV02
			BES0073
			BES M18MG-USC70B-BV02
			BES02NU
			BES M18MG-UOC70B-BV02
10...36 V DC	10...30 V DC	10...55 V DC	10...36 V DC
4 V	4 V	4 V	≤ 5 V
75 V DC	75 V DC	75 V DC	75 V DC
100 mA	100 mA	100 mA	100 mA
5 mA	5 mA	5 mA	5 mA
600 µA	600 µA	600 µA	600 µA
1 µF	1 µF	1 µF	1 µF
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
600 Hz	600 Hz	600 Hz	600 Hz
Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE	CE, cULus
Brass-coated	Brass-coated	Brass-coated	Brass-coated
PA 12	With ceramic coating	PA 12	PA 12
0.3 m PUR cable with M12 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin	2 m PVC cable, 3x0.34 mm ²



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire
Cylinder Designs

Block Designs

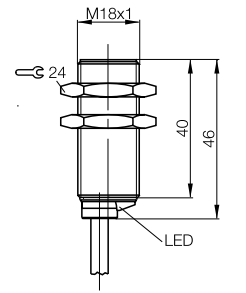
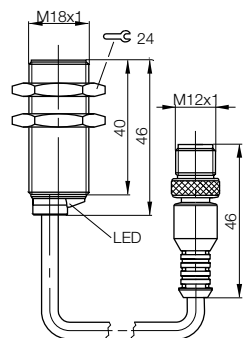
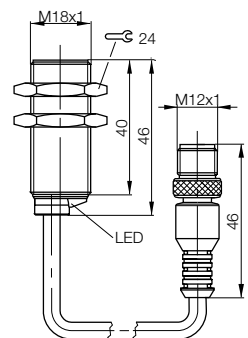
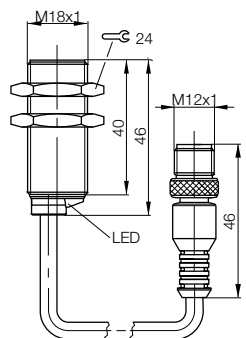
AC/DC 2-wire

AC 2-wire

Special Properties

Analog Distance Measurement

Accessories

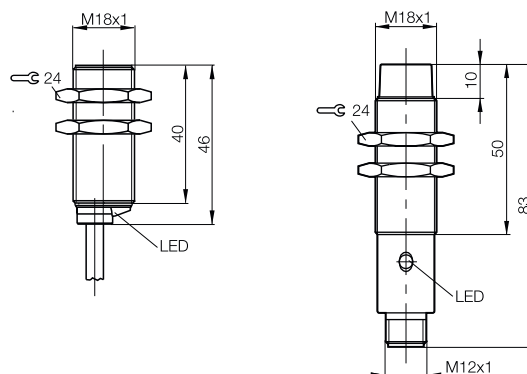




Model	M18x1	M18x1	
Installation type (observe instructions in the Basic Information chapter)	Flush	Not flush	
Rated switching distance s_n	7 mm	8 mm	
Assured switching distance s_a	0...5.6 mm	0...6.5 mm	
Switching distance marking	■ ■	■	
Polarized, NO	Ordering code		
	Part number		
Polarized, NC	Ordering code		
	Part number		
Non-polarized, NO	Ordering code	BES039N	
	Part number	BES M18MG-USH70B-BV02	
Non-polarized, NC	Ordering code		BES0322
	Part number		BES 516-547-S4-H
Supply voltage U_s	10...55 V DC	10...55 V DC	
Voltage drop U_d at I_o max.	5 V	5 V	
Rated insulation voltage U_i (protection class)	75 V DC	250 V AC (□)	
Rated operating current I_o	100 mA	200 mA	
Minimum operating current I_m	5 mA	5 mA	
Residual current I_r max.	600 μ A	500 μ A	
Permissible load capacitance max.	1 μ F	1 μ F	
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	
Ambient temperature T_a	-25...+70 °C	-25...+70 °C	
Switching frequency f max.	600 Hz	200 Hz	
Output function indicator	Yellow LED	Yellow LED	
Degree of protection as per IEC 60529	IP 67	IP 68 per BWN Pr. 20	
Approvals	CE	CE, cULus	
Material	Housing Sensing surface	Brass-coated Brass-coated	
		PA 12 PA 12	
Connection	2 m PVC cable, 2x0.34 mm ²	M12 connector, 4-pin	

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request.





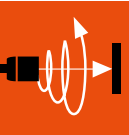
Global



Global



M30x1.5	M30x1.5	M30x1.5	M30x1.5
Flush	Flush	Flush	Flush
10 mm	15 mm	15 mm	15 mm
0...8 mm	0...12 mm	0...12 mm	0...12 mm
■	■ ■	■ ■	■ ■
	BES027L	BES008W	
	BES M30MF-GSC15B-S04G	BES M30MF-GSC15B-S04K	
	BES027C	BES027J	
	BES M30MF-GOC15B-S04G	BES M30MF-GOC15B-S04K	
	BES027E	BES0094	BES03FP
	BES M30MF-USC15B-S04G	BES M30MF-USC15B-S04K	BES M30MF-USH15B-S04K
BES031T	BES027F	BES027H	
BES 516-541-S4-H	BES M30MF-UOC15B-S04G	BES M30MF-UOC15B-S04K	
10...55 V DC	10...36 V DC	10...36 V DC	10...55 V DC
5 V	≤ 5 V	≤ 5 V	5 V
250 V AC (□)	75 V DC	75 V DC	75 V DC
200 mA	100 mA	100 mA	100 mA
5 mA	5 mA	5 mA	5 mA
500 µA	600 µA	600 µA	600 µA
1 µF	1 µF	1 µF	1 µF
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
150 Hz	400 Hz	400 Hz	400 Hz
Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 68 per BWN Pr. 20	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE
Brass-coated	Brass-coated	Brass-coated	Brass-coated
PA 12	PA 12	PA 12	PA 12
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

Cylinder Designs

Block Designs

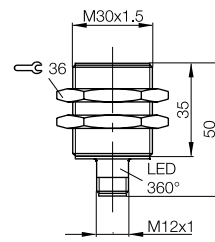
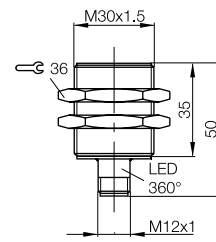
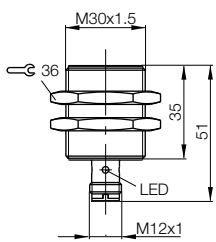
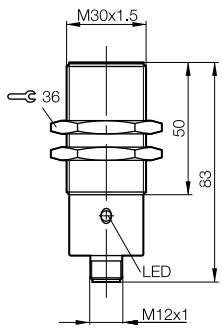
AC/DC 2-wire

AC 2-wire

Special Properties

Analog Distance Measurement

Accessories

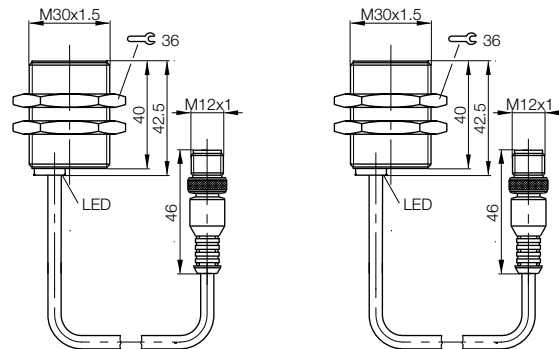




Model		M30×1.5	M30×1.5
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush
Rated switching distance s_n		15 mm	15 mm
Assured switching distance s_a		0...12 mm	0...12 mm
Switching distance marking		■ ■	■ ■
Polarized, NO	Ordering code	BES03H5	BES032A
	Part number	BES M30MF-GSH15B-BP00,3-GS04	BES M30MF-GSC15B-BP00,3-GS04-101
Polarized, NC	Ordering code		
	Part number		
Non-polarized, NO	Ordering code		
	Part number		
Non-polarized, NC	Ordering code		
	Part number		
Supply voltage U_s		10...55 V DC	10...36 V DC
Voltage drop U_d at I_e max.		4 V	4 V
Rated insulation voltage U_i (protection class)		75 V DC	75 V DC
Rated operating current I_e		100 mA	100 mA
Minimum operating current I_m		5 mA	5 mA
Residual current I_r max.		600 μ A	600 μ A
Permissible load capacitance max.		1 μ F	1 μ F
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C
Switching frequency f max.		400 Hz	400 Hz
Output function indicator		Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67
Approvals		CE	CE, cULus
Material	Housing	Brass-coated	Brass-coated
	Sensing surface	PA 12	With ceramic coating
Connection		0.3 m PUR cable with M12 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request.





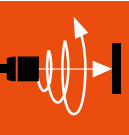
Global



Global



M30x1.5	M30x1.5	M30x1.5	M30x1.5
Flush	Flush	Flush	Not flush
15 mm	15 mm	15 mm	15 mm
0...12 mm	0...12 mm	0...12 mm	0...12 mm
■ ■	■ ■	■ ■	■
BES008Y	BES008R		
BES M30MF-GSC15B-BP00,3-GS04	BES M30MF-GSC15B-BV02		
BES03H4	BES0279		
BES M30MF-GOC15B-BP00,3-GS04	BES M30MF-GOC15B-BV02		
	BES0091	BES03FT	
	BES M30MF-USC15B-BV02	BES M30MF-USH15B-BV02	
	BES027A		BES0323
	BES M30MF-UOC15B-BV02		BES 516-549-S4-H
10...36 V DC	10...36 V DC	10...55 V DC	10...55 V DC
4 V	≤ 5 V	5 V	5 V
75 V DC	75 V DC	75 V DC	250 V AC (□)
100 mA	100 mA	100 mA	200 mA
5 mA	5 mA	5 mA	5 mA
600 µA	600 µA	600 µA	500 µA
1 µF	1 µF	1 µF	1 µF
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
400 Hz	400 Hz	400 Hz	100 Hz
Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 68 per BWN Pr. 20
CE, cULus	CE, cULus	CE	CE, cULus
Brass-coated	Brass-coated	Brass-coated	Brass-coated
PA 12	PA 12	PA 12	PA 12
0.3 m PUR cable with M12 connector, 4-pin	2 m PVC cable, 2x0.34 mm ²	2 m PVC cable, 2x0.34 mm ²	M12 connector, 4-pin



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

Cylinder Designs

Block Designs

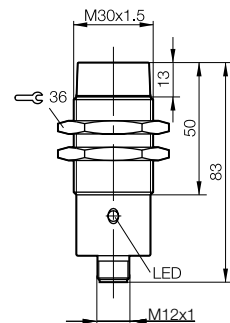
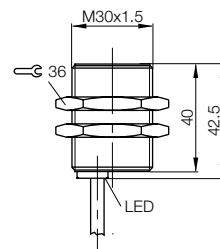
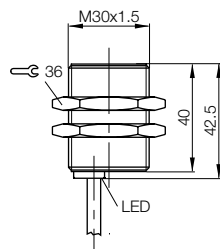
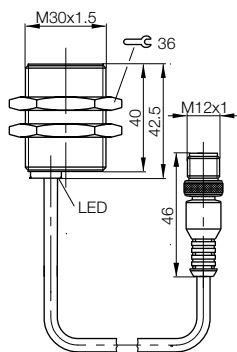
AC/DC 2-wire

AC 2-wire

Special Properties

Analog Distance Measurement

Accessories



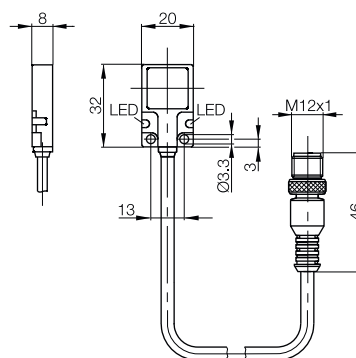


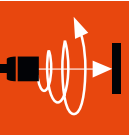
Model	20×32×8 mm R01	
Installation type (observe instructions in the Basic Information chapter)	Flush	
Rated switching distance s_n	5 mm	
Assured switching distance s_a	0...3.9 mm	
Switching distance marking	■	
Non-polarized, NO	Ordering code	BES03TM
	Part number	BES R01ZC-USC50B-BP00.2-GS04-101
Supply voltage U_s	10...30 V DC	
Voltage drop U_d at I_e max.	5 V	
Rated insulation voltage U_i	75 V DC	
Rated operating current I_e	100 mA	
Minimum operating current I_m	5 mA	
Residual current I_r max.	600 μ A	
Permissible load capacitance max.	1 μ F	
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	
Ambient temperature T_a	-25...+70 °C	
Switching frequency f max.	300 Hz	
Output function indicator	Yellow LED	
Degree of protection as per IEC 60529	IP 67	
Approvals	CE	
Material	Housing	Cast zinc
	Sensing surface	With ceramic coating
Connection	0.2 m PUR cable with M12 connector, 4-pin	

Wiring diagrams, see page 958.

The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request.





Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

Cylinder Designs

Block Designs

AC/DC 2-wire

AC 2-wire

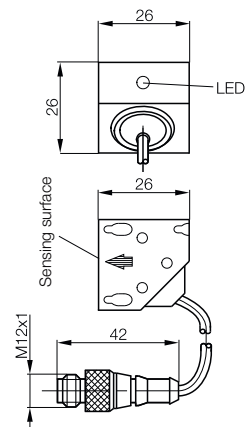
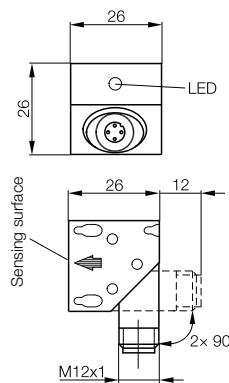
Special Properties

Analog Distance Measurement

Accessories

Model	26×26×26 mm Z03	26×26×26 mm Z03
Installation type (observe instructions in the Basic Information chapter)	Flush	Flush
Rated switching distance s_n	10 mm	10 mm
Assured switching distance s_a	0...8.1 mm	0...8.1 mm
Switching distance marking	■	■
Polarized, NO	BES030H	BES030E
Ordering code		
Part number	BES Z03K-GSS10B-S04U-006	BES Z03K-GSS10B-EP00,15-GS04-006
Supply voltage U_s	10...36 V DC	10...36 V DC
Voltage drop U_d at I_e max.	4.6 V	4.6 V
Rated insulation voltage U_i (protection class)	250 V AC (□)	250 V AC (□)
Rated operating current I_e	100 mA	100 mA
Minimum operating current I_m	2 mA	2 mA
Residual current I_r max.	600 μ A	600 μ A
Permissible load capacitance max.	0.1 μ F	0.1 μ F
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a	-25...+70 °C	-25...+70 °C
Switching frequency f max.	250 Hz	250 Hz
Output function indicator	Yellow LED	Yellow LED
Degree of protection as per IEC 60529	IP 67	IP 67
Approvals	CE	CE
Material	PA	PA
Housing	PA	PA
Sensing surface	PA	PA
Connection	M12 connector, 4-pin	0.15 m PUR cable with M12 connector, 4-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

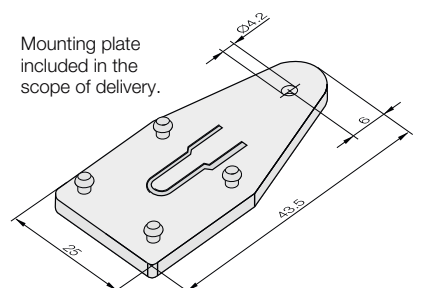
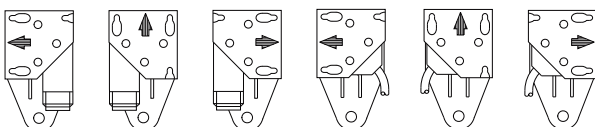


Small, compact block sensor with increased switching distance for quick installation

The connector mount can be rotated and the sensing face can be oriented in three directions.

Simple replacement with no loss of position thanks to the fixed mounting plate:

- Cost savings
- No special tools necessary
- Simple to install

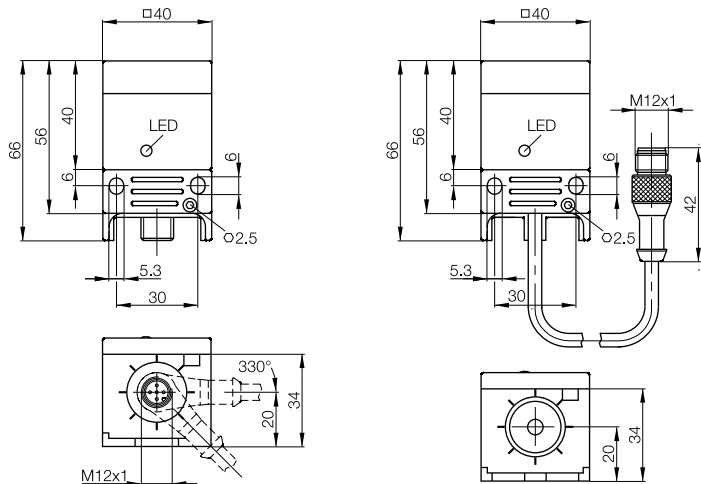


Mounting plate included in the scope of delivery.



Model		40×66×40 mm Unicompact	40×66×40 mm Unicompact
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush
Rated switching distance s_n		15 mm	15 mm
Assured switching distance s_a		0...12 mm	0...12 mm
Switching distance marking		■	■
Polarized, NO	Ordering code	BES0303	BES0302
	Part number	BES Q40KFU-GSH15B-S04G	BES Q40KFU-GSH15B-EP00,8-GS04
Polarized, NC	Ordering code		BES0301
	Part number		BES Q40KFU-GOH15B-EP00,8-GS04
Supply voltage U_S		10...55 V DC	10...55 V DC
Voltage drop U_d at I_e max.		4.6 V	4.6 V
Rated insulation voltage U_i (protection class)		250 V AC (□)	250 V AC (□)
Rated operating current I_e		100 mA	100 mA
Minimum operating current I_m		2 mA	5 mA
Residual current I_r max.		800 μ A	800 μ A
Permissible load capacitance max.		1 μ F	1 μ F
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C
Switching frequency f max.		150 Hz	150 Hz
Output function indicator		Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67
Approvals		CE	CE
Material	Housing	PPE, PPS	PPE, PPS
	Sensing surface	PPE	PPE
Connection		M12 connector, 4-pin	0.8 m PUR cable with M12 connector, 4-pin

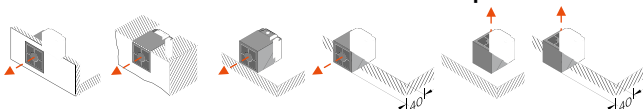
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

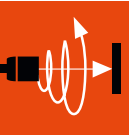


Unicompact

The flexible sensor for mechanical engineering and equipment manufacturing. The detection direction can be adjusted in 5 directions. Long switching distance in compact package.

Permissible installation variations for Unicompact





Model	40×121×40 mm Unisensor	
Installation type (observe instructions in the Basic Information chapter)	Not flush	
Rated switching distance s_n	20 mm	
Assured switching distance s_a	0...16 mm	
Switching distance marking	■	
Polarized, complementary	Ordering code	BES0309
	Part number	BES Q40KU-GPH20F-KM21
Supply voltage U_S	10...55 V DC	
Voltage drop U_d at I_o max.	4.6 V	
Rated insulation voltage U_i (protection class)	250 V AC (Ⓜ)	
Rated operating current I_o	400 mA	
Minimum operating current I_m	4 mA	
Residual current I_r max.	1 mA	
Permissible load capacitance max.	1 μ F	
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	
Ambient temperature T_a	-25...+80 °C	
Switching frequency f max.	300 Hz	
Output function indicator	Red LED	
Degree of protection as per IEC 60529	IP 65	
Approvals	CE	
Material	Housing	PPE
	Sensing surface	PPE
Connection	Screw terminal	

Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

Cylinder Designs

Block Designs

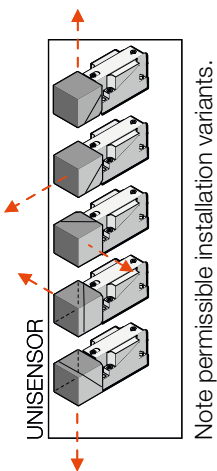
AC/DC 2-wire

AC 2-wire

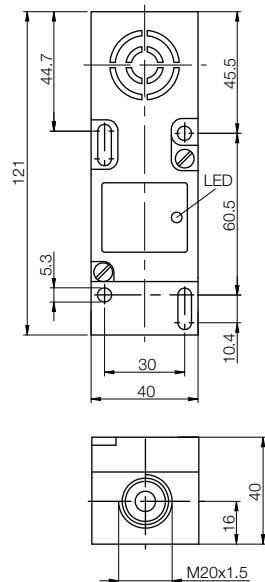
Special Properties

Analog Distance Measurement

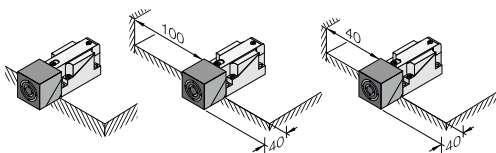
Accessories



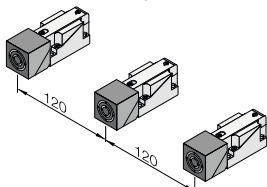
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.



Installation variations



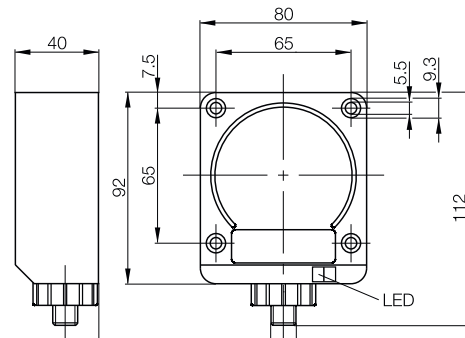
Row mounting





Model	80×92×40 mm Maxisensor	
Installation type (observe instructions in the Basic Information chapter)	Flush	
Rated switching distance s_n	50 mm	
Assured switching distance s_a	0...40 mm	
Switching distance marking	■	
Polarized, NO	Ordering code	BES030A
	Part number	BES Q80KA-GSH50B-S04Q
Supply voltage U_S	10...55 V DC	
Voltage drop U_d at I_e max.	4.6 V	
Rated insulation voltage U_i (protection class)	250 V AC (Ⓜ)	
Rated operating current I_e	400 mA	
Minimum operating current I_m	4 mA	
Residual current I_r max.	600 μ A	
Permissible load capacitance max.	1 μ F	
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	
Ambient temperature T_a	-25...+70 °C	
Switching frequency f max.	90 Hz	
Output function indicator	Yellow LED	
Degree of protection as per IEC 60529	IP 67	
Approvals	CE	
Material	Housing	PPE
	Sensing surface	PPE
Connection	M12 connector, 4-pin	

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

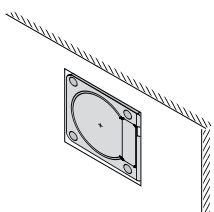


Maxisensor

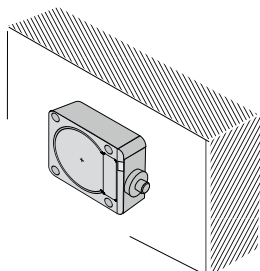
Long switching distance with low installation height in the detection direction. Ideal for equipment manufacturing and conveyor technology.

Permissible Maxisensor installation options

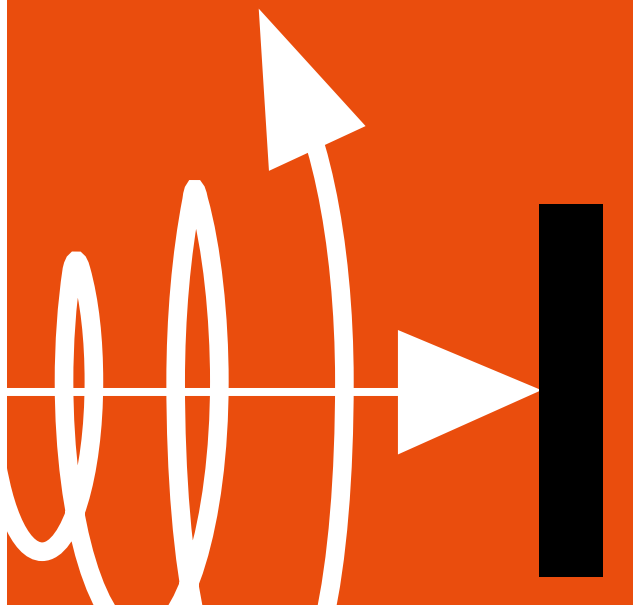
Installation in steel or non-ferrous metals



Installation on steel or non-ferrous metals



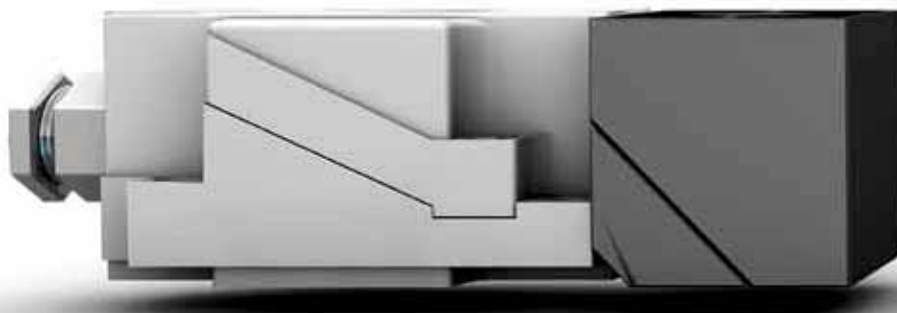
The switching distance is reduced by max. 5.5 mm when not installed flush.



Inductive Sensors

AC/DC 2-wire Inductive Sensors

Our standard product line in the 2-wire version with AC/DC technology: In this comprehensive product line Balluff offers sensors from M12 to 80×80 mm for virtually every application in the field of automation. These high-quality sensors are designed and manufactured according to worldwide standards and the latest technology. We inspect absolutely every one of our products, providing you the peace of mind that you are receiving only carefully checked sensors.

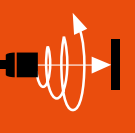


Cylinder Designs

M12×1	591
M18×1	592
M30×1.5	595

Block Designs

26×40×12 mm (R05)	599
40×73×40 mm (Unicomact)	601
40×120×40 mm (Unisensor)	603
80×80×40 mm (Maxisensor)	607



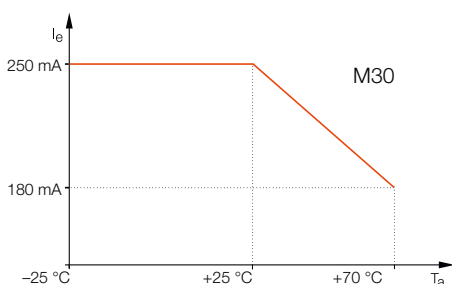
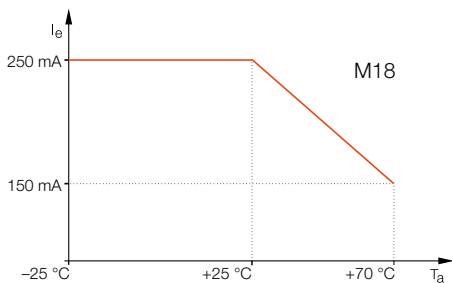
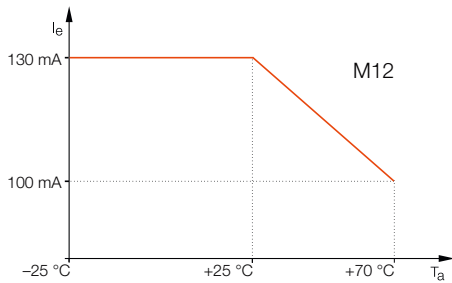
Basic information
and definitions
can be found
on **page 934**.





Model	
Installation type (observe instructions in the Basic Information chapter)	
Rated switching distance s_n	
Assured switching distance s_a	
Switching distance marking	
NO	Ordering code
	Part number
NC	Ordering code
	Part number
Rated operating voltage U_e	
Supply voltage U_S	
Voltage drop U_d at I_e max.	
Rated insulation voltage U_i	
Rated operating current I_e	
Minimum operating current I_m	
Residual current I_r max.	
Short-term current carrying capacity I_c /time T	
Short-circuit protected	
Ambient temperature T_a	
Switching frequency f max.	
Utilization category	
Output function indicator	
Degree of protection as per IEC 60529	
Approvals	
Material	Housing
	Sensing surface
Connection	

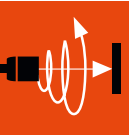
Current reduction as a function of ambient temperature range



Wiring diagrams, see page 958.

The meaning of switching distance markings can be found on page 962.

Cable versions (protection class 2) on request.



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

Cylinder Designs

Block Designs

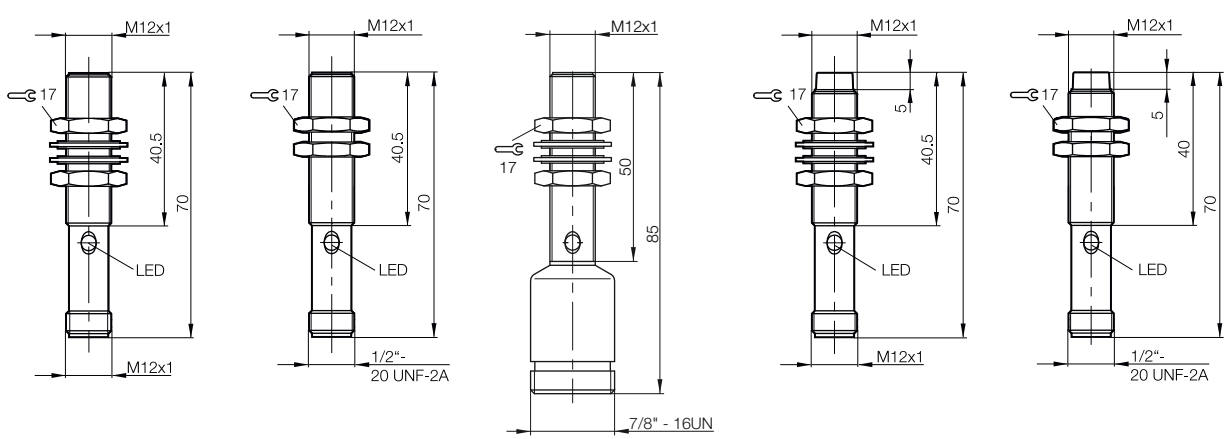
AC 2-wire

Special Properties

Analog Distance Measurement

Accessories

M12x1	M12x1	M12x1	M12x1	M12x1
Flush	Flush	Flush	Not flush	Not flush
2 mm	2 mm	2 mm	4 mm	4 mm
0...1.6 mm	0...1.6 mm	0...1.6 mm	0...3.2 mm	0...3.2 mm
■	■	■	■	■
BES027W	BES02E3	BES027Y	BES028C	BES02E4
BES 516-207-S27-E	BES 515-207-S21-E	BES 516-207-S5-E	BES 516-209-S27-E	BES 515-209-S21-E
BES0283		BES0284	BES028K	
BES 516-208-S27-E		BES 516-208-S5-E	BES 516-210-S27-E	
110 V AC	110 V AC	110 V AC	110 V AC	110 V AC
20...250 V AC/DC	20...250 V AC/DC	20...250 V AC/DC	20...250 V AC/DC	20...250 V AC/DC
11 V	11 V	11 V	11 V	11 V
250 V AC	250 V AC	250 V AC	250 V AC	250 V AC
130 mA	130 mA	130 mA	130 mA	130 mA
5 mA	5 mA	5 mA	5 mA	5 mA
1.7 mA	1.7 mA	1.7 mA	1.7 mA	1.7 mA
0.7 A/20 ms	0.7 A/20 ms	0.7 A/20 ms	0.7 A/20 ms	0.7 A/20 ms
Yes	Yes	Yes	Yes	Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
1 kHz	1 kHz	1 kHz	600 Hz	600 Hz
AC 140/DC 13	AC 140/DC 13	AC 140/DC 13	AC 140/DC 13	AC 140/DC 13
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
PA 12	PA 12	PA 12	PA 12	PA 12
M12 connector, 3-pin	1/2" 20UNF-2A plug connector, 3-pin	7/8" 16UN plug connector, 3-pin	M12 connector, 3-pin	1/2" 20UNF-2A plug connector, 3-pin



AC/DC 2-wire Inductive Sensors

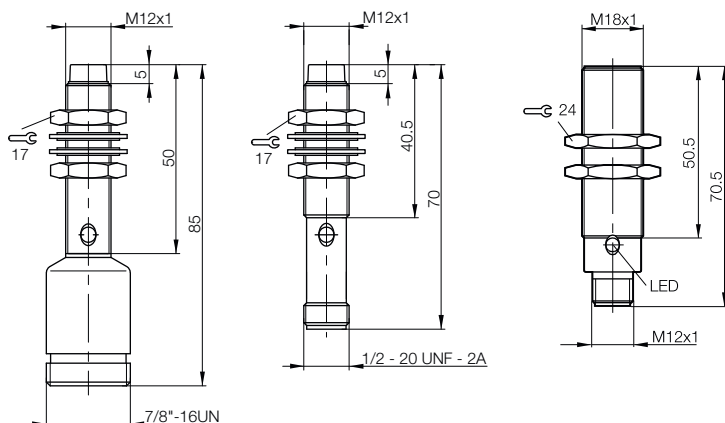
Cylinder design, M12x1, M18x1



Model	M12x1	M12x1	M18x1
Installation type (observe instructions in the Basic Information chapter)	Not flush	Not flush	Flush
Rated switching distance s_n	4 mm	8 mm	5 mm
Assured switching distance s_a	0...3.2 mm	0...6.4 mm	0...4 mm
Switching distance marking	■	■■	■
NO	Ordering code	BES028E	BES028R
	Part number	BES 516-209-S5-E	BES 516-209-G-S21-E
NC	Ordering code		BES0290
	Part number		BES 516-212-E5-E-S27
Rated operating voltage U_o	110 V AC	110 V AC	110 V AC
Supply voltage U_s	20...250 V AC/DC	20...250 V AC/DC	20...250 V AC/DC
Voltage drop U_d at I_o max.	11 V	11 V	11 V
Rated insulation voltage U_i	250 V AC	250 V AC	250 V AC
Rated operating current I_o	130 mA	130 mA	250 mA
Minimum operating current I_m	5 mA	5 mA	5 mA
Residual current I_r max.	1.7 mA	1.7 mA	1.7 mA
Short-term current carrying capacity I_c /time T	0.7 A/20 ms	0.7 A/20 ms	1.5 A/20 ms
Short-circuit protected	Yes	Yes	Yes
Ambient temperature T_a	-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.	600 Hz	600 Hz	400 Hz
Utilization category	AC 140/DC 13	AC 140/DC 13	AC 140/DC 13
Output function indicator	Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67
Approvals	CE, cULus	CE, cULus	CE, cULus
Material	Housing: Stainless steel	Housing: Stainless steel	Housing: Brass-coated
	Sensing surface: PA 12	Sensing surface: PA 12	Sensing surface: PA 12
Connection	7/8" 16UN plug connector, 3-pin	1/2" 20UNF-2A plug connector, 3-pin	M12 connector, 3-pin

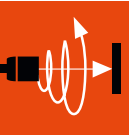
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Cable versions (protection class 2) on request.

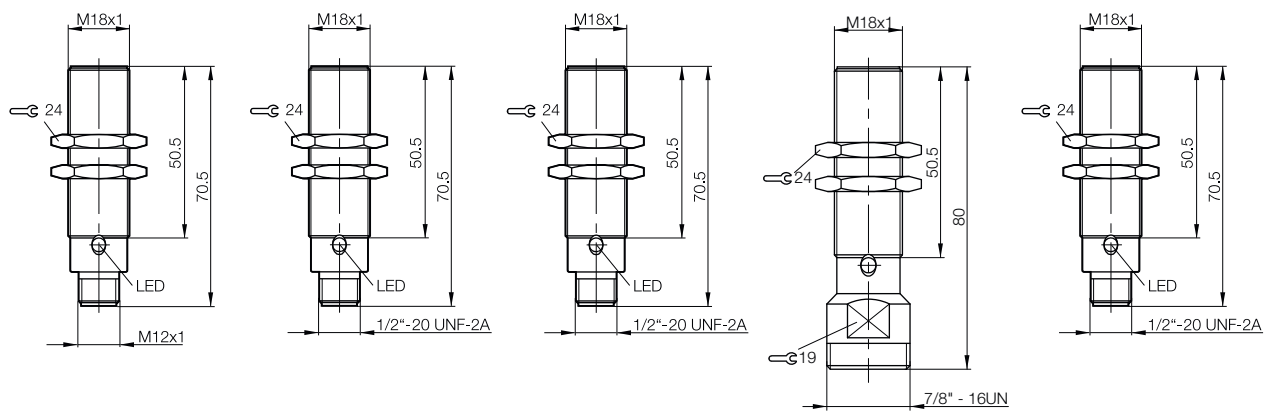




M18x1	M18x1	M18x1	M18x1	M18x1
Flush	Flush	Flush	Flush	Flush
5 mm	5 mm	5 mm	5 mm	8 mm
0...4 mm	0...4 mm	0...4 mm	0...4 mm	0...6.4 mm
■	■	■	■	■ ■
BES02E6	BES028P	BES02E5	BES028T	BES02ZE
BES 515-211-E5-E-S27	BES 516-211-E5-E-S21	BES 515-211-E5-E-S21	BES 516-211-E5-E-S5	BES M18MN-USU80B-S21G
	BES028Z		BES0291	
	BES 516-212-E5-E-S21		BES 516-212-E5-E-S5	
110 V AC	110 V AC	110 V AC	110 V AC	110 V AC
20...250 V AC/DC	20...250 V AC/DC	20...250 V AC/DC	20...250 V AC/DC	20...300 V AC/DC
11 V	11 V	11 V	11 V	8 V
250 V AC	250 V AC	250 V AC	250 V AC	250 V AC
250 mA	250 mA	250 mA	250 mA	200 mA
5 mA	5 mA	5 mA	5 mA	4 mA
1.7 mA	1.7 mA	1.7 mA	1.7 mA	0.8 mA
1.5 A/20 ms	1.5 A/20 ms	1.5 A/20 ms	1.5 A/20 ms	1.5 A/20 ms
Yes	Yes	Yes	Yes	Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
400 Hz	400 Hz	400 Hz	400 Hz	30 Hz
AC 140/DC 13	AC 140/DC 13	AC 140/DC 13	AC 140/DC 13	AC 140/DC 13
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Stainless steel	Brass-coated	Stainless steel	Brass-coated	Brass-coated
PA 12	PA 12	PA 12	PA 12	PBT
M12 connector, 3-pin	1/2" 20UNF-2A plug connector, 3-pin	1/2" 20UNF-2A plug connector, 3-pin	7/8" 16UN plug connector, 3-pin	1/2" 20UNF-2A plug connector, 3-pin



Inductive Sensors
Global DC 3-wire
DC 3-/4-wire
DC 2-wire
AC/DC 2-wire
Cylinder Designs
Block Designs
AC 2-wire
Special Properties
Analog Distance Measurement
Accessories



AC/DC 2-wire Inductive Sensors

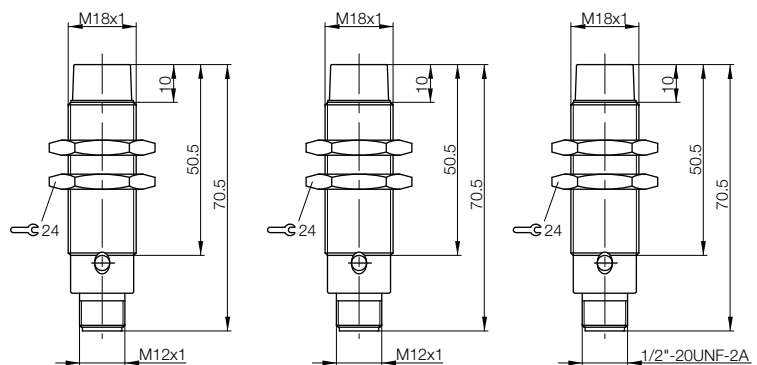
Cylinder designs, M18x1



Model		M18x1	M18x1	M18x1
Installation type (observe instructions in the Basic Information chapter)		Not flush	Not flush	Not flush
Rated switching distance s_n		8 mm	8 mm	8 mm
Assured switching distance s_a		0...6.4 mm	0...6.4 mm	0...6.4 mm
Switching distance marking		■	■	■
NO	Ordering code	BES0297	BES02E8	BES0296
	Part number	BES 516-213-E5-E-S27	BES 515-213-E5-E-S27	BES 516-213-E5-E-S21
NC	Ordering code	BES029J		BES029H
	Part number	BES 516-214-E5-E-S27		BES 516-214-E5-E-S21
Rated operating voltage U_o		110 V AC	110 V AC	110 V AC
Supply voltage U_s		20...250 V AC/DC	20...250 V AC/DC	20...250 V AC/DC
Voltage drop U_d at I_o max.		11 V	11 V	11 V
Rated insulation voltage U_i		250 V AC	250 V AC	250 V AC
Rated operating current I_o		250 mA	250 mA	250 mA
Minimum operating current I_m		5 mA	5 mA	5 mA
Residual current I_r max.		1.7 mA	1.7 mA	1.7 mA
Short-term current carrying capacity I_c /time T		1.5 A/20 ms	1.5 A/20 ms	1.5 A/20 ms
Short-circuit protected		Yes	Yes	Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		250 Hz	250 Hz	250 Hz
Utilization category		AC 140/DC 13	AC 140/DC 13	AC 140/DC 13
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Approvals		CE, cULus	CE, cULus	CE, cULus
Material	Housing	Brass-coated	Stainless steel	Brass-coated
	Sensing surface	PA 12	PA 12	PA 12
Connection		M12 connector, 3-pin	M12 connector, 3-pin	1/2" 20UNF-2A plug connector, 3-pin

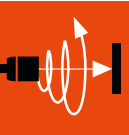
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Cable versions (protection class 2) on request.

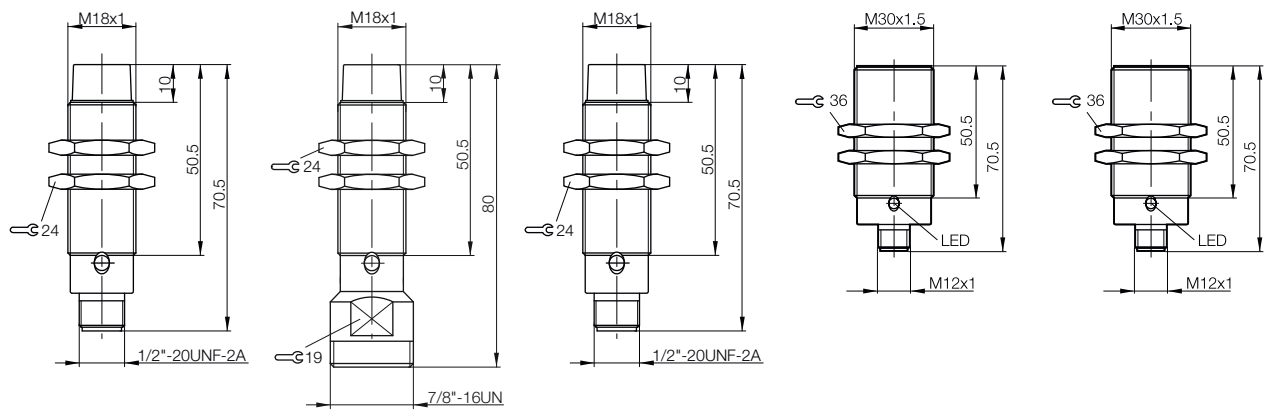




M18x1	M18x1	M18x1	M30x1.5	M30x1.5
Not flush	Not flush	Not flush	Flush	Flush
8 mm	8 mm	16 mm	10 mm	10 mm
0...6.4 mm	0...6.4 mm	0...13 mm	0...8.1 mm	0...8.1 mm
■	■	■ ■	■	■
BES02E7	BES0298	BES029A		BES02EA
BES 515-213-E5-E-S21	BES 516-213-E5-E-S5	BES 516-213-G-E5-E-S21		BES 515-215-E5-E-S27
			BES02A3	
			BES 516-216-E5-E-S27	
110 V AC	110 V AC	110 V AC	110 V AC	110 V AC
20...250 V AC/DC	20...250 V AC/DC	20...250 V AC/DC	20...250 V AC/DC	20...250 V AC/DC
11 V	11 V	11 V	11 V	11 V
250 V AC	250 V AC	250 V AC	250 V AC	250 V AC
250 mA	250 mA	250 mA	250 mA	250 mA
5 mA	5 mA	5 mA	5 mA	5 mA
1.7 mA	1.7 mA	1.7 mA	1.7 mA	1.7 mA
1.5 A/20 ms	1.5 A/20 ms	1.5 A/1 ms	3 A/20 ms	3 A/20 ms
Yes	Yes	Yes	Yes	Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
250 Hz	250 Hz	250 Hz	150 Hz	150 Hz
AC 140/DC 13	AC 140/DC 13	AC 140/DC 13	AC 140/DC 13	AC 140/DC 13
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Stainless steel	Brass-coated	Brass-coated	Brass-coated	Stainless steel
PA 12	PA 12	PA 12	PA 12	PA 12
1/2" 20UNF-2A plug connector, 3-pin	7/8" 16UN plug connector, 3-pin	1/2" 20UNF-2A plug connector, 3-pin	M12 connector, 3-pin	M12 connector, 3-pin



Inductive Sensors
Global DC 3-wire
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DC 2-wire
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Block Designs
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AC/DC 2-wire Inductive Sensors

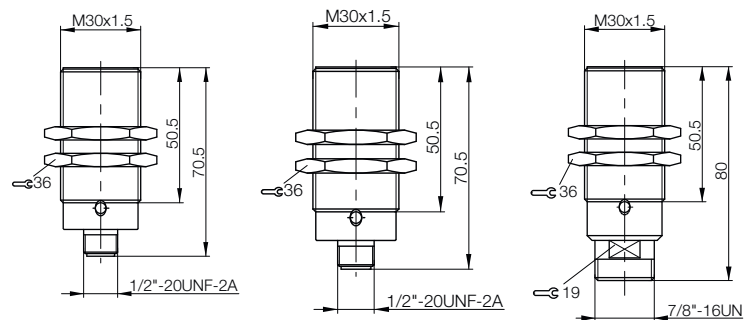
Cylinder designs, M30x1.5

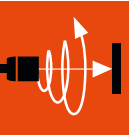


Model		M30x1.5	M30x1.5	M30x1.5
Installation type (observe instructions in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		10 mm	10 mm	10 mm
Assured switching distance s_a		0...8.1 mm	0...8.1 mm	0...8.1 mm
Switching distance marking		■	■	■
NO	Ordering code	BES029T	BES02E9	BES029W
	Part number	BES 516-215-E5-E-S21	BES 515-215-E5-E-S21	BES 516-215-E5-E-S5
NC	Ordering code	BES02A2		BES02A4
	Part number	BES 516-216-E5-E-S21		BES 516-216-E5-E-S5
Rated operating voltage U_e		110 V AC	110 V AC	110 V AC
Supply voltage U_S		20...250 V AC/DC	20...250 V AC/DC	20...250 V AC/DC
Voltage drop U_d at I_e max.		11 V	11 V	11 V
Rated insulation voltage U_i		250 V AC	250 V AC	250 V AC
Rated operating current I_e		250 mA	250 mA	250 mA
Minimum operating current I_m		5 mA	5 mA	5 mA
Residual current I_r max.		1.7 mA	1.7 mA	1.7 mA
Short-term current carrying capacity I_c /time T		3 A/20 ms	3 A/20 ms	3 A/20 ms
Short-circuit protected		Yes	Yes	Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		150 Hz	150 Hz	150 Hz
Utilization category		AC 140/DC 13	AC 140/DC 13	AC 140/DC 13
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Approvals		CE, cULus	CE, cULus	CE, cULus
Material	Housing	Brass-coated	Stainless steel	Brass-coated
	Sensing surface	PA 12	PA 12	PA 12
Connection		1/2" 20UNF-2A plug connector, 3-pin	1/2" 20UNF-2A plug connector, 3-pin	7/8" 16UN plug connector, 3-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Cable versions (protection class 2) on request.





Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

Cylinder Designs

Block Designs

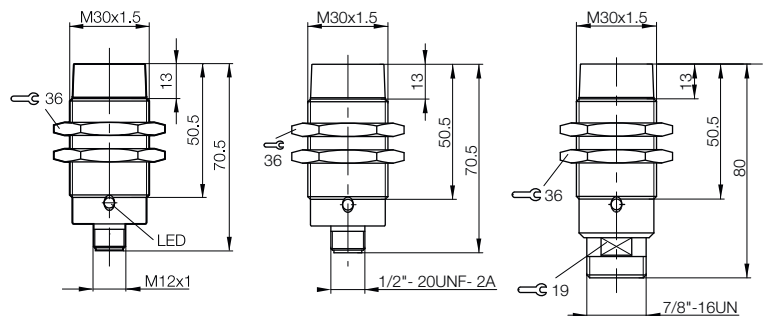
AC 2-wire

Special Properties

Analog Distance Measurement

Accessories

M30x1.5	M30x1.5	M30x1.5		
Not flush	Not flush	Not flush		
15 mm	15 mm	15 mm		
0...12.1 mm	0...12.1 mm	0...12.1 mm		
■	■	■		
BES02AC	BES02AA	BES02AE		
BES 516-217-E5-E-S27	BES 516-217-E5-E-S21	BES 516-217-E5-E-S5		
BES02AL	BES02AK	BES02AM		
BES 516-218-E5-E-S27	BES 516-218-E5-E-S21	BES 516-218-E5-E-S5		
110 V AC	110 V AC	110 V AC		
20...250 V AC/DC	20...250 V AC/DC	20...250 V AC/DC		
11 V	11 V	11 V		
250 V AC	250 V AC	250 V AC		
250 mA	250 mA	250 mA		
5 mA	5 mA	5 mA		
1.7 mA	1.7 mA	1.7 mA		
3 A/20 ms	3 A/20 ms	3 A/20 ms		
Yes	Yes	Yes		
-25...+70 °C	-25...+70 °C	-25...+70 °C		
100 Hz	100 Hz	100 Hz		
AC 140/DC 13	AC 140/DC 13	AC 140/DC 13		
Yellow LED	Yellow LED	Yellow LED		
IP 67	IP 67	IP 67		
CE, cULus	CE, cULus	CE, cULus		
Brass-coated	Brass-coated	Brass-coated		
PA 12	PA 12	PA 12		
M12 connector, 3-pin	1/2" 20UNF-2A plug connector, 3-pin	7/8" 16UN plug connector, 3-pin		

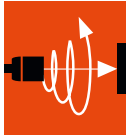


Position detection with inductive sensors BES – for the greatest possible reliability: In foundry work, exact position detection is absolutely essential for precisely controlled pouring of the metal. Balluff inductive sensors can be integrated into the existing feed system and detect the stationary ladle position right before pouring.



Assembly procedures require precise knowledge about the position of materials. Balluff inductive sensors BES also identify metals over long distances and in harsh environments.





Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

Cylinder Designs

Block Designs

AC 2-wire

Special Properties

Analog Distance Measurement

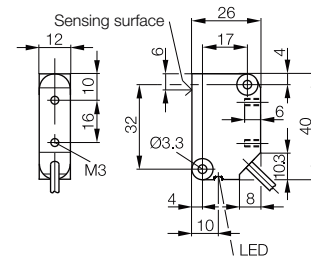
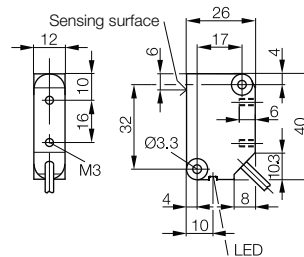
Accessories

Model	26×40×12 mm R05	26×40×12 mm R05
Installation type (observe instructions in the Basic Information chapter)	Flush	Flush
Rated switching distance s_n	2 mm	4 mm
Assured switching distance s_a	0...1.6 mm	0...3.2 mm
Switching distance marking	■	■■
NO	Ordering code	BES02CT
	Part number	BES R05KB-USU20B-EV02
Rated operating voltage U_o	110 V AC	110 V AC
Supply voltage U_s	20...250 V AC/DC	20...250 V AC/DC
Voltage drop U_d at I_o max.	12 V	12 V
Rated insulation voltage U_i (protection class)	250 V AC (□)	250 V AC (□)
Rated operating current I_o	130 mA	130 mA
Minimum operating current I_m	5 mA	5 mA
Residual current I_r max.	1.7 mA	1.7 mA
Short-term current carrying capacity I_c /time T	0.7 A/20 ms	0.7 A/20 ms
Short-circuit protected	Yes	Yes
Ambient temperature T_a	-25...+70 °C	-25...+70 °C
Switching frequency f max.	400 Hz	400 Hz
Utilization category	AC 140/DC 13	AC 140/DC 13
Output function indicator	Yellow LED	Yellow LED
Degree of protection as per IEC 60529	IP 67	IP 67
Approvals	CE	CE
Material	Housing Sensing surface	PA 12 PA 12
Connection	2 m PVC cable, 2×0.34 mm ²	2 m PVC cable, 2×0.34 mm ²

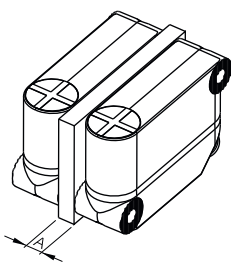
Wiring diagrams, see page 958.

The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request.



Row mounting

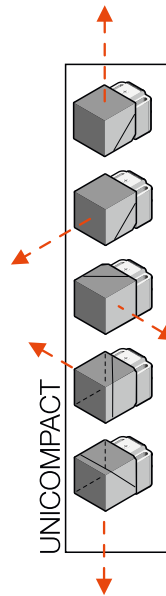


■ With plastics or no material present in the space:

Distance A = at least 5 mm

■ With metal in the space:

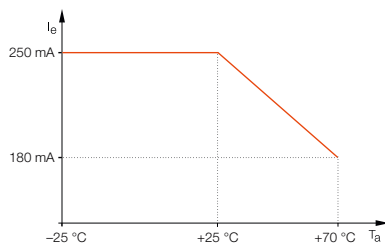
Distance A = at least 4 mm



Note permissible installation variants.

Model		
Installation type (observe instructions in the Basic Information chapter)		
Rated switching distance s_n		
Assured switching distance s_a		
Switching distance marking		
NO	Ordering code	
	Part number	
NC	Ordering code	
	Part number	
Rated operating voltage U_e		
Supply voltage U_S		
Voltage drop U_d at I_e max.		
Rated insulation voltage U_i		
Rated operating current I_e		
Minimum operating current I_m		
Residual current I_r max.		
Short-term current carrying capacity I_c /time T		
Short-circuit protected		
Ambient temperature T_a		
Switching frequency f max.		
Utilization category		
Output function indicator		
Degree of protection as per IEC 60529		
Approvals		
Material	Housing	
	Sensing surface	
Possible installation variations		
Connection		

Current reduction as a function of ambient temperature range

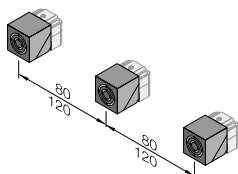


Wiring diagrams, see page 958.

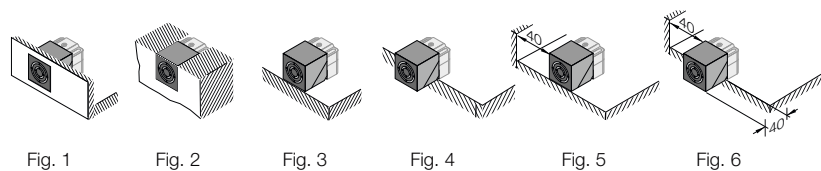
The meaning of switching distance markings can be found on page 962.

Row mounting

Flush 80 mm, not flush 120 mm

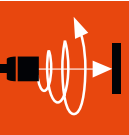


Installation variations

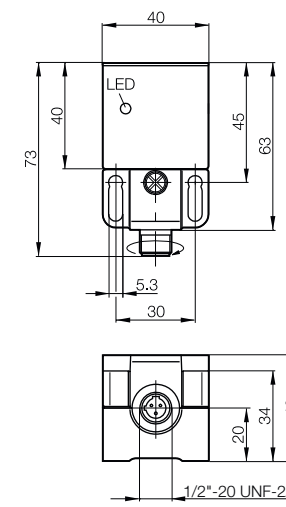
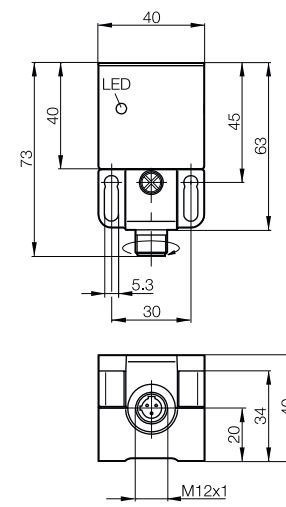
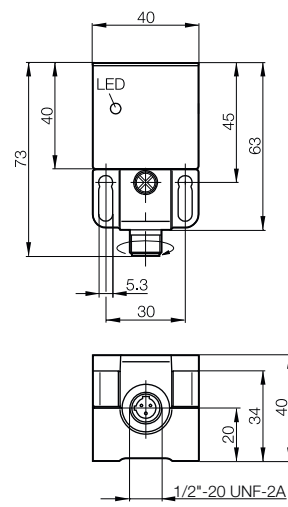
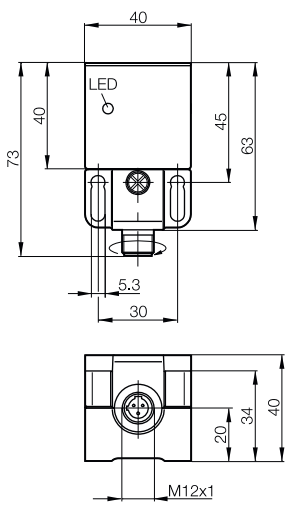




40×73×40 mm Unicomact	40×73×40 mm Unicomact	40×73×40 mm Unicomact	40×73×40 mm Unicomact
Flush	Flush	Not flush	Not flush
15 mm	15 mm	25 mm	25 mm
0...12 mm	0...12 mm	0...20.2 mm	0...20.2 mm
■	■	■	■
BES022E	BES022A	BES022H	BES022F
BES Q40KEU-USU15B-S27G	BES Q40KEU-USU15B-S21G	BES Q40KEU-USU25F-S27G	BES Q40KEU-USU25F-S21G
BES0212	BES0211		BES0213
BES Q40KEU-UOU15B-S27G	BES Q40KEU-UOU15B-S21G		BES Q40KEU-UOU25F-S21G
110 V AC	110 V AC	110 V AC	110 V AC
20...250 V AC/DC	20...250 V AC/DC	20...250 V AC/DC	20...250 V AC/DC
11 V	11 V	11 V	11 V
250 V AC	250 V AC	250 V AC	250 V AC
250 mA	250 mA	250 mA	250 mA
5 mA	5 mA	5 mA	5 mA
1.7 mA	1.7 mA	1.7 mA	1.7 mA
2 A/20 ms	2 A/20 ms	2 A/20 ms	2 A/20 ms
Yes	Yes	Yes	Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
100 Hz	100 Hz	100 Hz	100 Hz
AC 140/DC 13	AC 140/DC 13	AC 140/DC 13	AC 140/DC 13
Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67
CE	CE	CE	CE
PBT/Cast zinc	PBT/Cast zinc	PBT/Cast zinc	PBT/Cast zinc
PBT	PBT	PBT	PBT
Image 1...6	Image 1...6	Image 3...6	Image 3...6
M12 connector, 3-pin	1/2" 20UNF-2A plug connector, 3-pin	M12 connector, 3-pin	1/2" 20UNF-2A plug connector, 3-pin

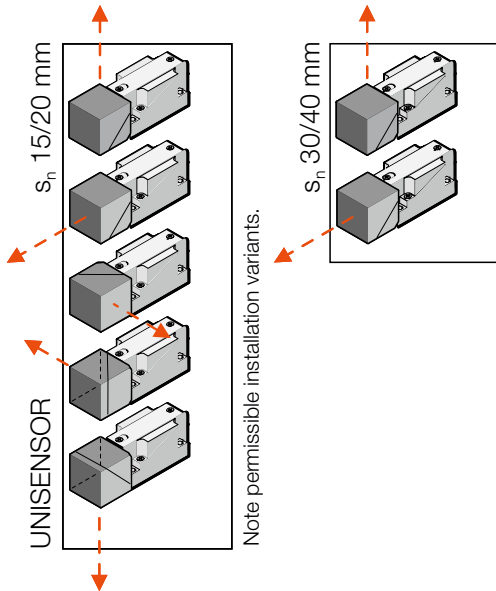


Inductive Sensors
Global DC 3-wire
DC 3-/4-wire
DC 2-wire
AC/DC 2-wire
Cylinder Designs
Block Designs
AC 2-wire
Special Properties
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Accessories



Programmable Unisensor

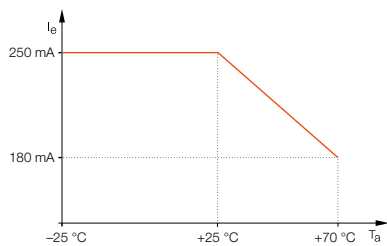
Unisensors can be switched between a normally open function- and a normally closed function. A wire jumper is used to change the setting.



Model	
Installation type (observe instructions in the Basic Information chapter)	
Rated switching distance s_n	
Assured switching distance s_a	
Switching distance marking	
NO/NC	Ordering code
programmable	Part number
Rated operating voltage U_o	
Supply voltage U_S	
Voltage drop U_d at I_o max.	
Rated insulation voltage U_i (protection class)	
Rated operating current I_o	
Minimum operating current I_m	
Residual current I_r max.	
Short-term current carrying capacity I_c /time T	
Short-circuit protected	
Ambient temperature T_a	
Switching frequency f max.	
Utilization category	
Output function indicator	
Degree of protection as per IEC 60529	
Approvals	
Material	Housing
	Sensing surface
Possible installation variations	
Connection	

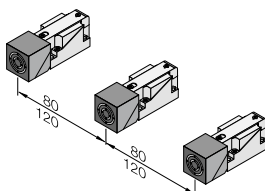
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Current reduction as a function of ambient temperature range

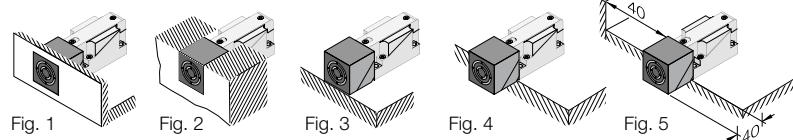


Row mounting

Flush 80 mm,
Not flush 120 mm

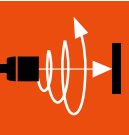


Installation variations

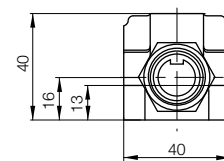
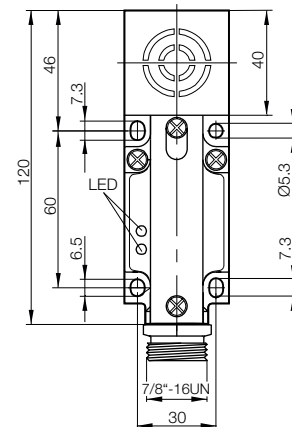
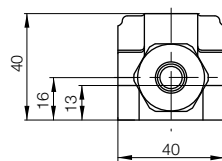
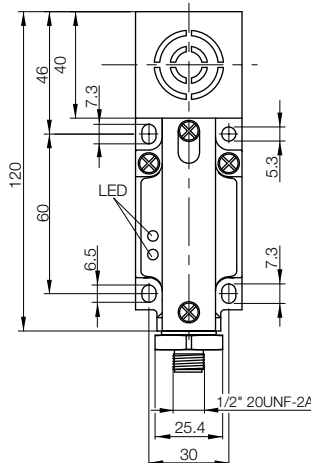
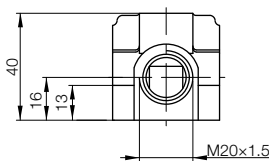
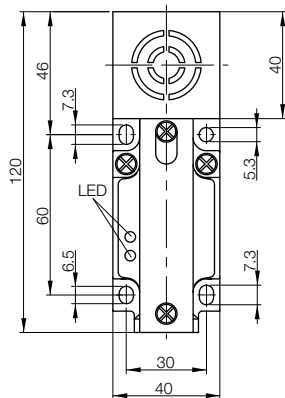




40×120×40 mm Unisensor	40×120×40 mm Unisensor	40×120×40 mm Unisensor
Flush	Flush	Flush
15 mm	15 mm	15 mm
0...12 mm	0...12 mm	0...12 mm
■	■	■
BES020Y	BES0242	BES0243
BES 517-223-M3-E	BES 517-223-U3-E-S21	BES 517-223-U3-E-S5
110 V AC	110 V AC	110 V AC
20...250 V AC/DC	20...250 V AC/DC	20...250 V AC/DC
10.5 V	10.5 V	10.5 V
250 V AC (□)	250 V AC	250 V AC
250 mA	250 mA	250 mA
5 mA	5 mA	5 mA
1.7 mA	1.7 mA	1.7 mA
1 A/20 ms	1 A/20 ms	1 A/20 ms
Yes	Yes	Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C
100 Hz	100 Hz	100 Hz
AC 140/DC 13	AC 140/DC 13	AC 140/DC 13
Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus
PBT/aluminum	PBT/aluminum	PBT/aluminum
PBT	PBT	PBT
Image 1...5	Image 1...5	Image 1...5
Screw terminal	1/2" 20UNF-2A plug connector, 3-pin	7/8" 16UN plug connector, 3-pin



- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- Cylinder Designs
- Block Designs**
- AC 2-wire
- Special Properties
- Analog Distance Measurement
- Accessories



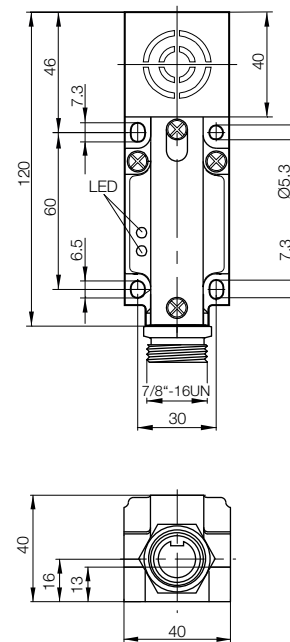
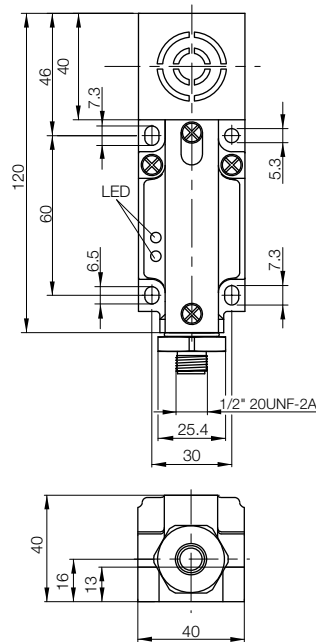
AC/DC 2-wire Inductive Sensors

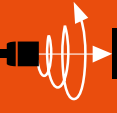
Block designs, 40×120×40 mm



Model	40×120×40 mm Unisensor		40×120×40 mm Unisensor	
Installation type (observe instructions in the Basic Information chapter)	Not flush		Not flush	
Rated switching distance s_n	20 mm		20 mm	
Assured switching distance s_a	0...16 mm		0...16 mm	
Switching distance marking	■		■	
NO/NC programmable	Ordering code	BES0245	BES0246	
	Part number	BES 517-223-U4-E-S21	BES 517-223-U4-E-S5	
Rated operating voltage U_o	110 V AC		110 V AC	
Supply voltage U_s	20...250 V AC/DC		20...250 V AC/DC	
Voltage drop U_d at I_o max.	10.5 V		10.5 V	
Rated insulation voltage U_i	250 V AC		250 V AC	
Rated operating current I_o	250 mA		250 mA	
Minimum operating current I_m	5 mA		5 mA	
Residual current I_r max.	1.7 mA		1.7 mA	
Short-term current carrying capacity I_c /time T	1 A/20 ms		1 A/20 ms	
Short-circuit protected	Yes		Yes	
Ambient temperature T_a	-25...+70 °C		-25...+70 °C	
Switching frequency f max.	100 Hz		100 Hz	
Utilization category	AC 140/DC 13		AC 140/DC 13	
Output function indicator	Yellow LED		Yellow LED	
Degree of protection as per IEC 60529	IP 67		IP 67	
Approvals	CE, cULus		CE, cULus	
Material	Housing	PBT/aluminum	Housing	PBT/aluminum
	Sensing surface	PBT	Sensing surface	PBT
Possible installation variations	Fig. 4 and 5		Fig. 4 and 5	
Connection	1/2" 20UNF-2A plug connector, 3-pin		7/8" 16UN plug connector, 3-pin	

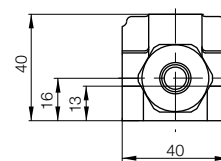
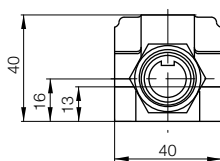
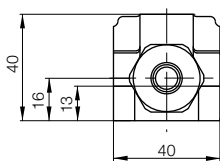
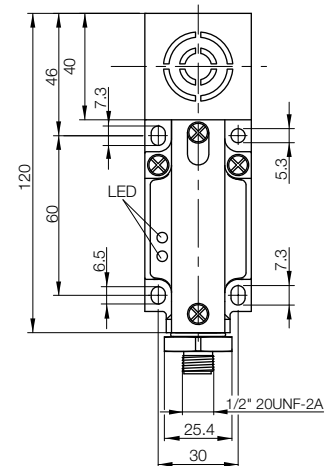
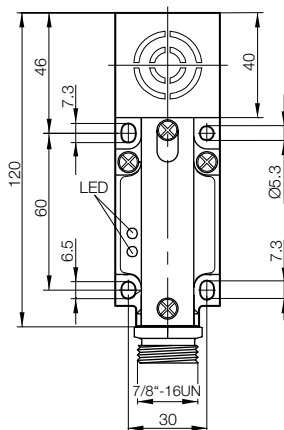
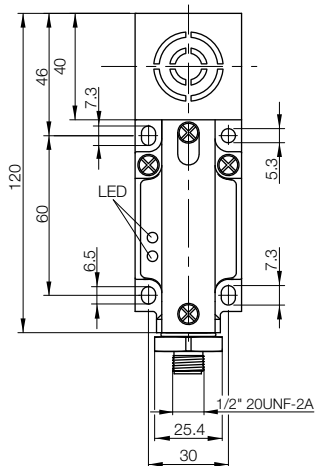
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.





Inductive Sensors
Global DC 3-wire
DC 3-/4-wire
DC 2-wire
AC/DC 2-wire
Cylinder Designs
Block Designs
AC 2-wire
Special Properties
Analog Distance Measurement
Accessories

40×120×40 mm Unisensor	40×120×40 mm Unisensor	40×120×40 mm Unisensor
Not flush	Not flush	Not flush
30 mm	30 mm	40 mm
0...24 mm	0...24 mm	0...32 mm
■	■	■
BES0248	BES0249	BES024C
BES 517-223-U5-E-S21	BES 517-223-U5-E-S5	BES 517-223-U7-EL-S21
110 V AC	110 V AC	110 V AC
20...250 V AC/DC	20...250 V AC/DC	20...250 V
10.5 V	10.5 V	12.5 V
250 V AC	250 V AC	250 V AC
250 mA	250 mA	250 mA
5 mA	5 mA	5 mA
1.7 mA	1.7 mA	1.7 mA
1 A/20 ms	1 A/20 ms	1 A/20 ms
Yes	Yes	Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C
100 Hz	100 Hz	100 Hz
AC 140/DC 13	AC 140/DC 13	AC 140/DC 13
Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus
PBT/aluminum	PBT/aluminum	PBT/aluminum
PBT	PBT	PBT
Fig. 4 and 5	Fig. 4 and 5	Fig. 4 and 5
1/2" 20UNF-2A plug connector, 3-pin	7/8" 16UN plug connector, 3-pin	1/2" 20UNF-2A plug connector, 3-pin





Precise pallet positioning using inductive sensors BES with long switching distance

Take advantage of the ability to position with precision and ensure a consistent production process. Rugged Maxisensors can be sunk into a plant floor to provide stopping points for vehicle assembly pallets.

Model		
Installation type (observe instructions in the Basic Information chapter)		
Rated switching distance s_n		
Assured switching distance s_a		
Switching distance marking		
NO/NC	Ordering code	
programmable	Part number	
Rated operating voltage U_e		
Supply voltage U_s		
Voltage drop U_d at I_e max.		
Rated insulation voltage U_i (protection class)		
Rated operating current I_e		
Minimum operating current I_m		
Residual current I_r max.		
Short-term current carrying capacity I_c /time T		
Short-circuit protected		
Ambient temperature T_a		
Switching frequency f max.		
Utilization category		
Output function indicator		
Degree of protection as per IEC 60529		
Approvals		
Material	Housing	
	Sensing surface	
Connection		

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Maxisensor can be programmed

Maxisensors can be set to have a normally open or normally closed function using a switch.

Mounting in non-ferrous metals

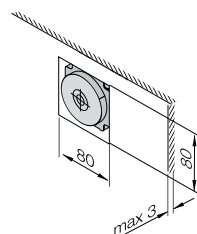


Fig. 1

Mounting in steel/ non-ferrous metals

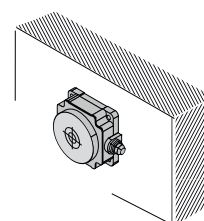
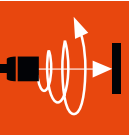
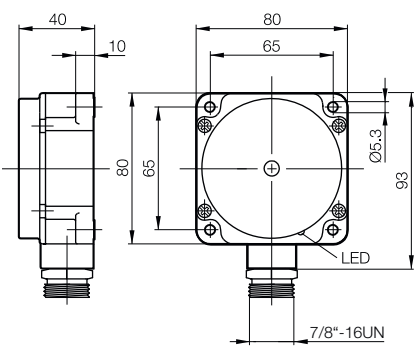
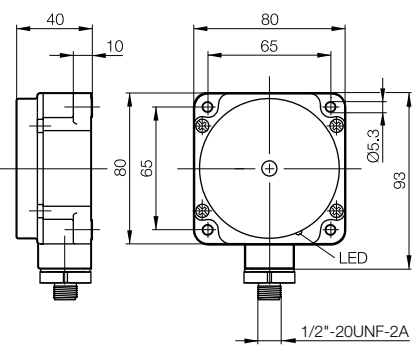
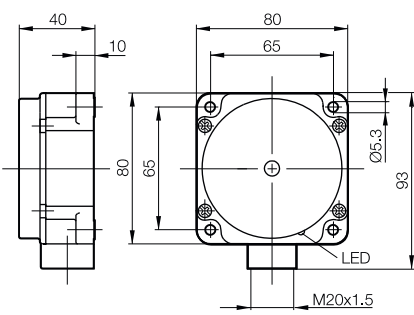


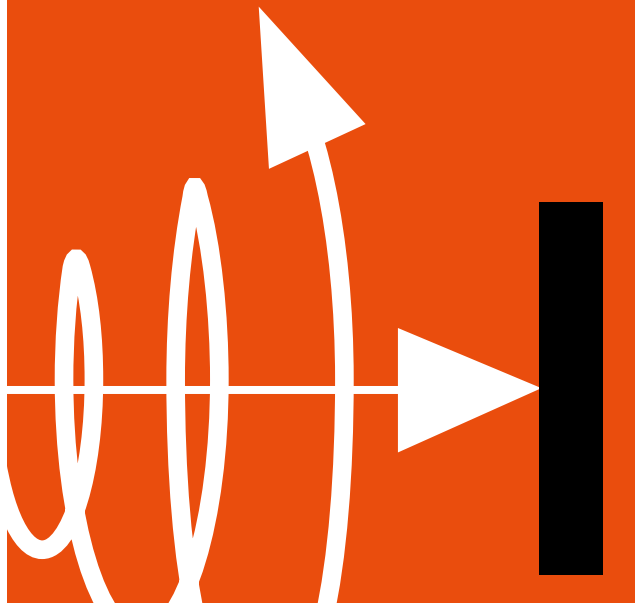
Fig. 2



Inductive Sensors
Global DC 3-wire
DC 3-/4-wire
DC 2-wire
AC/DC 2-wire
Cylinder Designs
Block Designs
AC 2-wire
Special Properties
Analog Distance Measurement
Accessories

80×80×40 mm Maxisensor	80×80×40 mm Maxisensor	80×80×40 mm Maxisensor
Not flush	Not flush	Not flush
50 mm	50 mm	50 mm
0...40.5 mm	0...40.5 mm	0...40.5 mm
■	■	■
BES024F	BES023C	BES01ZJ
BES 517-224-M5-E	BES 517-224-M5-E-S21	BES 517-224-U5-E-S5
110 V AC	110 V AC	110 V AC
20...250 V AC/DC	20...250 V AC/DC	20...250 V AC/DC
11 V	11 V	11 V
250 V AC (□)	250 V AC (□)	250 V AC (□)
250 mA	250 mA	250 mA
5 mA	5 mA	5 mA
≤ 1.7 mA	1700 µA	1700 µA
1 A/20 ms	1 A/20 ms	1 A/20 ms
Yes	Yes	Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C
10 Hz	10 Hz	10 Hz
AC 140/DC 13	AC 140/DC 13	AC 140/DC 13
Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus
PBT	PBT	PBT
PBT	PBT	PBT
Screw terminals	1/2" 20UNF-2A plug connector, 3-pin	7/8" 16UN plug connector, 3-pin





Inductive Sensors

AC 2-wire inductive sensors

Our standard line in 2-wire AC technology:

Balluff offers AC-sensors in the M12, M18, and M30 design and as Maxisensor series.

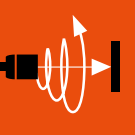


Cylinder Designs

M12×1	610
M18×1	612
M30×1.5	613

Block Designs

80×80×40 mm (Maxisensor)	615
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Basic information
and definitions
can be found
on **page 934**.



AC 2-wire Inductive Sensors

Cylinder designs, M12x1



AC sensors are optimized for processor units and controllers with alternating current input. These sensors are mainly used in Asia and America. When maintaining the rated operating current, the sensors can directly control fuses and relays.

Recommendation

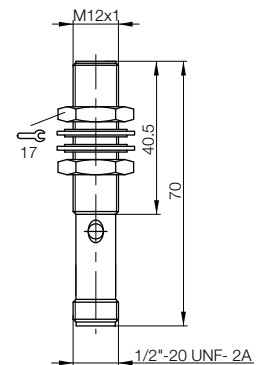
Short-circuit protection equipment: Miniature fuse in accordance with IEC 60127-2 Sheet 1, ≤ 2 A (fast-acting). See attachment-Circuit diagrams. After a short-circuit, check the device for proper function.



Model	M12x1	
Installation type (observe instructions in the Basic Information chapter)	Flush	
Rated switching distance s_n	2 mm	
Assured switching distance s_a	0...1.6 mm	
Switching distance marking	■	
NO	Ordering code	BES02CA
	Part number	BES 516-449-S21-L
Supply voltage U_S	20...250 V AC	
Voltage drop U_d at I_o max.	4 V	
Rated insulation voltage U_i (protection class)	250 V AC (II)	
Rated operating current I_o	500 mA	
Polarity reversal/short-circuit protected	Yes/No	
Ambient temperature T_a	-25...+70 °C	
Switching frequency f max.	25 Hz	
Utilization category	AC 140	
Function indicator	Yellow LED	
Degree of protection as per IEC 60529	IP 67	
Approvals	CE, cULus	
Material	Housing	Brass-coated
	Sensing surface	PA 12
Connection	1/2" 20UNF-2A plug connector, 3-pin	

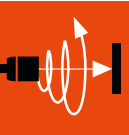
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths on request.

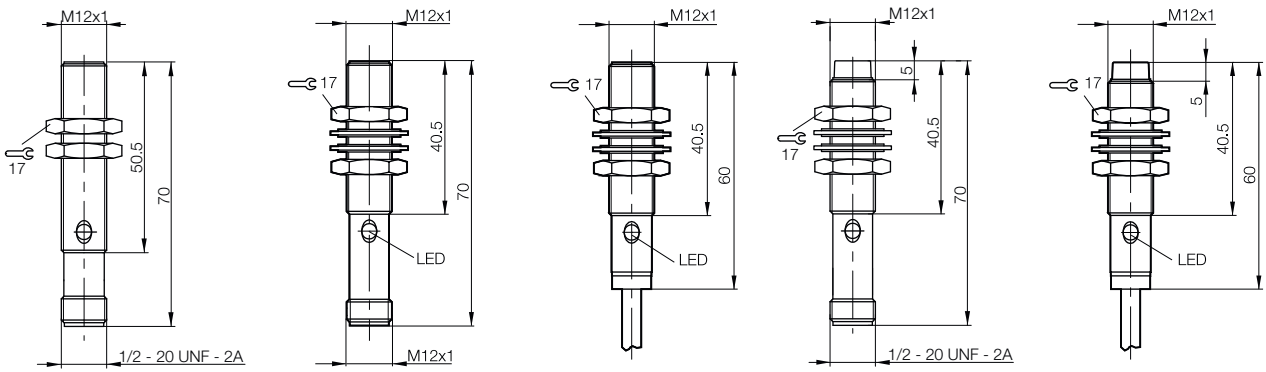




M12x1	M12x1	M12x1	M12x1	M12x1
Flush	Flush	Flush	Not flush	Not flush
2 mm	2 mm	2 mm	4 mm	4 mm
0...1.6 mm	0...1.6 mm	0...1.6 mm	0...3.2 mm	0...3.2 mm
■	■	■	■	■
BES02FP	BES0318	BES02C8	BES02CF	BES02CC
BES 515-449-SA7-S21	BES 516-449-S27-L	BES 516-449-BO-L-02	BES 516-461-S21-L	BES 516-461-BO-L-02
35...250 V AC	20...250 V AC	20...250 V AC	20...250 V AC	20...250 V AC
8.5 V	4 V	4 V	4 V	4 V
250 V AC	250 V AC	250 V AC (□)	250 V AC (□)	250 V AC (□)
150 mA	500 mA	500 mA	500 mA	500 mA
Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
10 Hz	25 Hz	25 Hz	25 Hz	25 Hz
AC 140	AC 140	AC 140	AC 140	AC 140
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Stainless steel	Brass-coated	Brass-coated	Brass-coated	Brass-coated
PA 12	PA 12	PA 12	PA 12	PA 12
1/2" 20UNF-2A plug connector, 3-pin	M12 connector, 3-pin	2 m PVC cable, 2x0.34 mm ²	1/2" 20UNF-2A plug connector, 3-pin	2 m PVC cable, 2x0.34 mm ²



- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Cylinder Designs
- Block Designs
- Special Properties
- Analog Distance Measurement
- Accessories

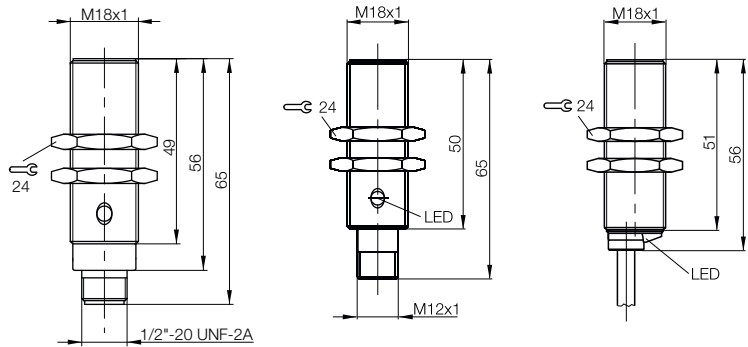




Model	M18x1	M18x1	M18x1
Installation type (observe instructions in the Basic Information chapter)	Flush	Flush	Flush
Rated switching distance s_n	5 mm	5 mm	5 mm
Assured switching distance s_a	0...4 mm	0...4 mm	0...4 mm
Switching distance marking	■	■	■
NO	Ordering code	BES0317	BES02AU
	Part number	BES 516-420-E5-L-S21	BES 516-420-E4-L-02
Rated operating voltage U_o	110 V	110 V	110 V
Supply voltage U_s	20...250 V AC	20...250 V AC	20...250 V AC
Voltage drop U_d at I_o max.	4 V	4 V	4 V
Rated insulation voltage U_i (protection class)	250 V AC (□)	250 V AC	250 V AC (□)
Rated operating current I_o	500 mA	500 mA	500 mA
Polarity reversal/short-circuit protected	Yes/No	Yes/No	Yes/No
Ambient temperature T_a	-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.	25 Hz	25 Hz	25 Hz
Utilization category	AC 140	AC 140	AC 140
Function indicator	Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67
Approvals	CE, cULus	CE, cULus	CE, cULus
Material	Housing: Brass-coated	Brass-coated	Brass-coated
	Sensing surface: PA 12	PA 12	PA 12
Connection	1/2" 20UNF-2A plug connector, 3-pin	M12 connector, 3-pin	2 m PVC cable, 2x0.34 mm ²

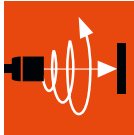
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths on request.



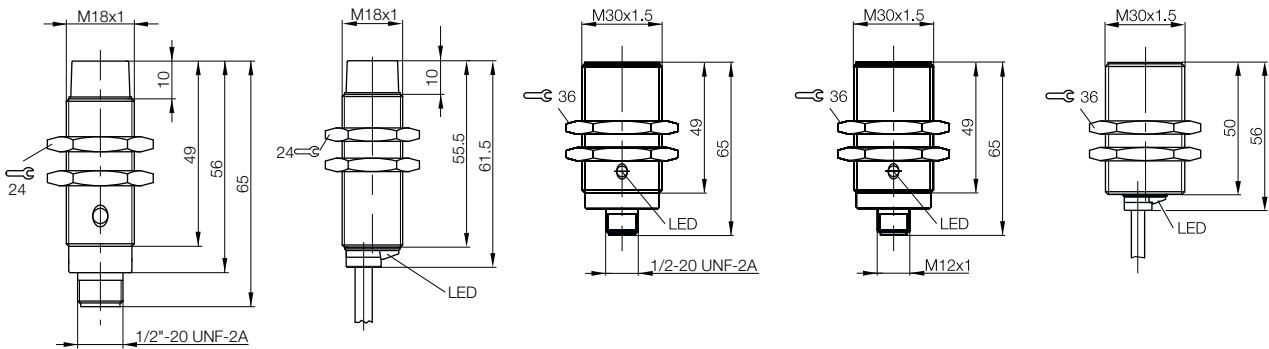


M18x1	M18x1	M30x1.5	M30x1.5	M30x1.5
Not flush	Not flush	Flush	Flush	Flush
8 mm	8 mm	10 mm	10 mm	10 mm
0...6.4 mm	0...6.4 mm	0...8 mm	0...8 mm	0...10 mm
■	■	■	■	■
BES02C7	BES02C5	BES02AT	BES0316	BES02AP
BES 516-437-E5-L-S21	BES 516-437-E4-L-02	BES 516-418-E5-L-S21	BES 516-418-E5-L-S27	BES 516-418-E4-L-02
110 V	110 V	110 V	110 V	110 V
20...250 V AC	20...250 V AC	20...250 V AC	20...250 V AC	20...250 V AC
4 V	4 V	4 V	4 V	4 V
250 V AC (□)	250 V AC (□)	250 V AC (□)	250 V AC	250 V AC (□)
500 mA	500 mA	500 mA	500 mA	500 mA
Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
25 Hz	25 Hz	25 Hz	25 Hz	10 Hz
AC 140	AC 140	AC 140	AC 140	AC 140
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Brass-coated	Brass-coated	Brass-coated	Brass-coated	Brass-coated
PA 12	PA 12	PA 12	PA 12	PA 12
1/2" 20UNF-2A plug connector, 3-pin	2 m PVC cable, 2x0.34 mm ²	1/2" 20UNF-2A plug connector, 3-pin	M12 connector, 3-pin	2 m PVC cable, 2x0.34 mm ²



- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Cylinder Designs
- Block Designs
- Special Properties
- Analog Distance Measurement

Accessories

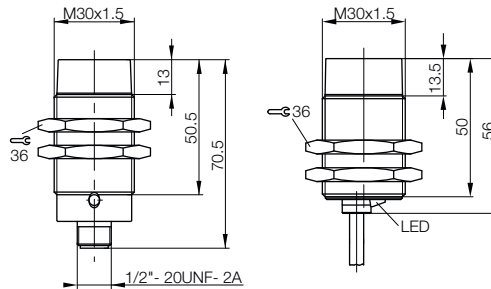




Model		M30x1.5	M30x1.5
Installation type (observe instructions in the Basic Information chapter)		Not flush	Not flush
Rated switching distance s_n		15 mm	15 mm
Assured switching distance s_a		0...12 mm	0...12 mm
Switching distance marking		■	■
NO	Ordering code	BES02C3	BES02C1
	Part number	BES 516-432-E5-L-S21	BES 516-432-E4-L-02
Supply voltage U_S		20...250 V AC	20...250 V AC
Voltage drop U_d at I_e max.		4 V	4 V
Rated insulation voltage U_i (protection class)		250 V AC (□)	250 V AC (□)
Rated operating current I_e		500 mA	500 mA
Polarity reversal/short-circuit protected		Yes/No	Yes/No
Ambient temperature T_a		-25...+70 °C	-25...+70 °C
Switching frequency f max.		10 Hz	10 Hz
Utilization category		AC 140	AC 140
Function indicator		Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67
Approvals		CE, cULus	CE, cULus
Material	Housing	Brass-coated	Brass-coated
	Sensing surface	PA 12	PA 12
Connection		1/2" 20UNF-2A plug connector, 3-pin	2 m PVC cable, 2x0.34 mm ²

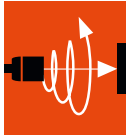
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths on request.





Model	80×80×40 mm Maxisensor	80×80×40 mm Maxisensor
Installation type (observe instructions in the Basic Information chapter)	Not flush	Not flush
Rated switching distance s_n	50 mm	50 mm
Assured switching distance s_a	0...40 mm	0...40 mm
Switching distance marking	■	■
NO/NC	Ordering code	BES022T
programmable	Part number	BES 517-460-U5-L-D-S21
Supply voltage U_s	20...250 V AC	20...250 V AC
Voltage drop U_d at I_e max.	7 V	7 V
Rated insulation voltage U_i (protection class)	250 V AC (□)	250 V AC (□)
Rated operating current I_e	500 mA	500 mA
Polarity reversal/short-circuit protected	Yes/No	Yes/No
Ambient temperature T_a	-25...+70 °C	-25...+70 °C
Switching frequency f max.	10 Hz	10 Hz
Utilization category	AC 140	AC 140
Function indicator	Yellow LED	Yellow LED
Degree of protection as per IEC 60529	IP 67	IP 67
Approvals	CE, cULus	CE, cULus
Material	Housing: PBT	PBT
	Sensing surface: PBT	PBT
Connection	1/2" 20UNF-2A plug connector, 3-pin	7/8" 16UN plug connector, 3-pin



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

AC 2-wire

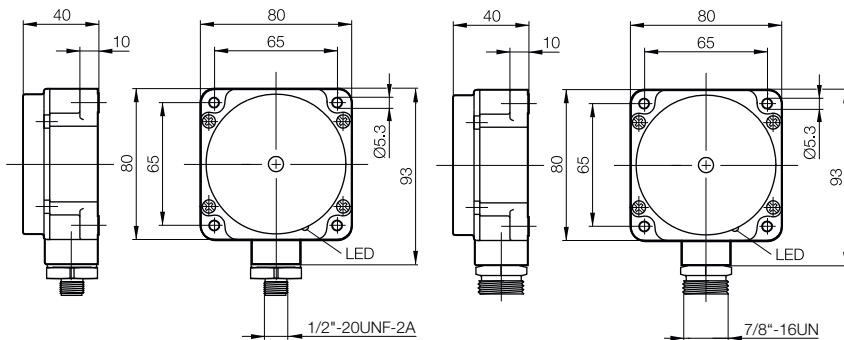
Cylinder Designs
Block Designs

Special Properties

Analog Distance Measurement

Accessories

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.



Maxisensor can be programmed

Maxisensors can be set to have a normally open- or normally closed function using a switch.

Mounting in non-ferrous metals

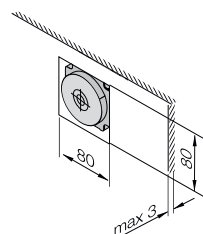


Fig. 1

Mounting in steel/non-ferrous metals

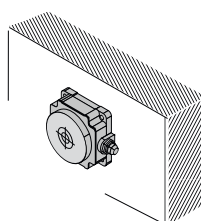
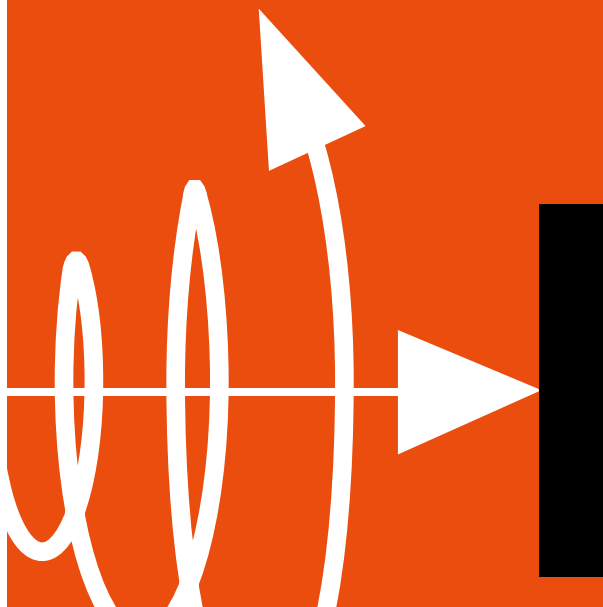


Fig. 2

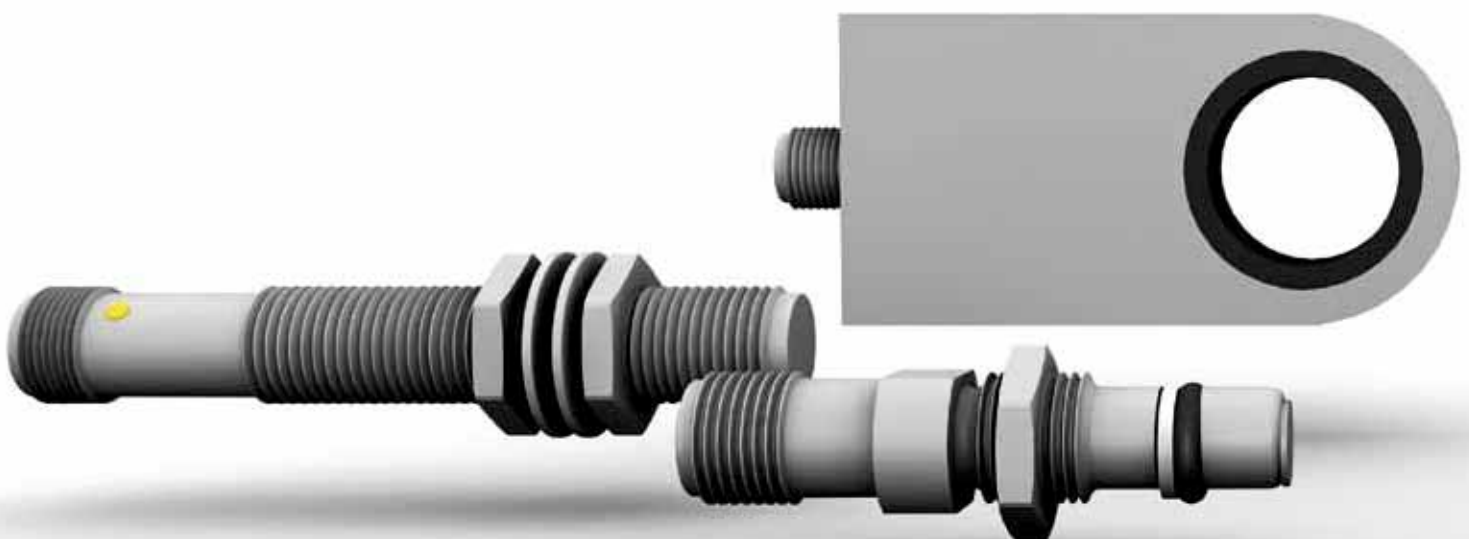


Inductive Sensors

Inductive sensors with special properties

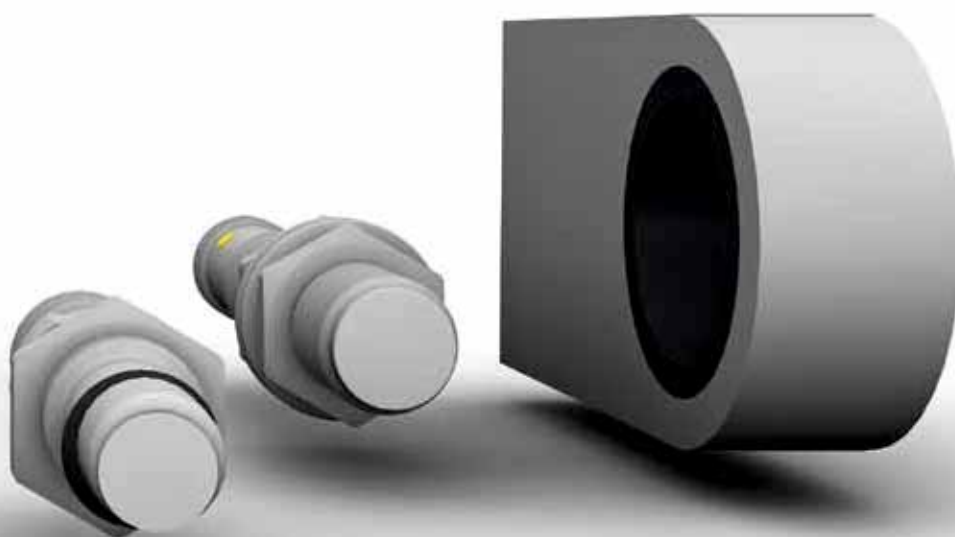
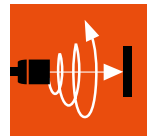
Our inductive sensors provide reliable solutions for special situations: with increased requirements such as high pressure or Factor 1, under rough conditions, in aggressive media and in the Ex area.

The product line also includes special versions such as hose or ring sensors for discharge and infeed and counting small parts and large designs with large switching distance.



Inductive Sensors with Special Properties

High-pressure resistant sensors	618
Ex sensors	634
Steelface sensors	640
High temperature rated sensors	646
Full PTFE sensor	650
Sensors for the food industry	652
Factor 1 sensors	662
Weld and magnetic field immune sensors	674
Diagnostic sensors	682
Large designs	688
Ring sensors	690
Hose sensors	692



Basic information and definitions can be found on **page 934**.

In the wide range of hydraulic applications, high pressure proximity switches are exposed to many aggressive media and hostile environments.

Numerous applications in hydraulic cylinders and valves have resulted in this model-rich sensor line. What are your requirements? Medium-resistant housing materials and a special sealing process result in pressure ratings from 3 to 500 bar, depending on the sensor type.

Different housing diameters and thread lengths can be developed according to the specific requirements of the application.

The output amplifier is installed so that no additional devices are necessary and a relay can be controlled directly. Pressure-tight proximity switches are available with molded-in cable or with plug-in connectors.

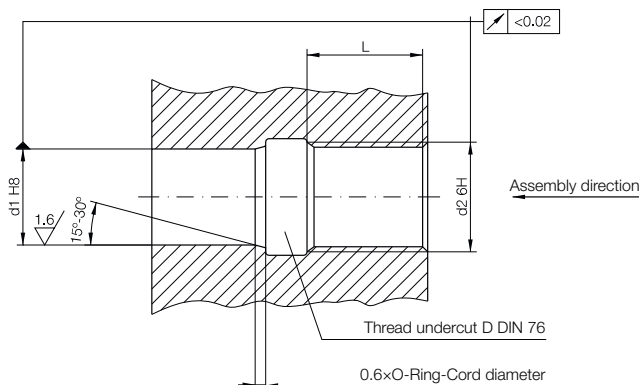


Size		
Installation type (pay attention to the note in the Basic Information chapter)		
Rated switching distance s_n		
Assured switching distance s_a		
Pressure range		
PNP, NO	Ordering code	
	Part number	
PNP, NC	Ordering code	
	Part number	
NPN, NO	Ordering code	
	Part number	
NPN, NC	Ordering code	
	Part number	
Supply voltage U_S		
Voltage drop U_d at I_o max.		
Rated insulation voltage U_i		
Rated operating current I_o		
Output resistance R_a		
Polarity reversal protected/transposition protected/short-circuit protected		
Ambient temperature T_a		
Switching frequency f max.		
Output function indicator		
Degree of protection as per IEC 60529		
Approvals		
Material	Housing	
	Sensing surface	
Sealing ring material/size/replacement part number		
Supporting ring material/size/replacement part number		
Connection		

Wiring diagrams, see page 958.

Additional cable lengths on request

Installation instruction for high pressure rated sensors with O-ring



For example, for BES 516-300-S270-S4-D:

d1: \varnothing of the positioning hole for the switch head $\varnothing 10^{H8} = \varnothing 10^{+0.022}$

d2: Nominal thread diameter M12x1 6H

L: Recommended screw-in depth $L \geq 0.8 \times d_2 = 0.8 \times 12 = 9.6$

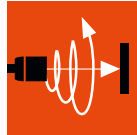
Inductive Sensors with Special Properties

High pressure rated sensors

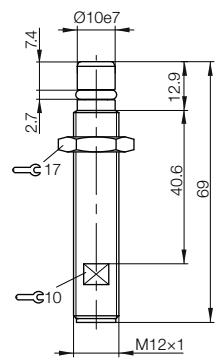
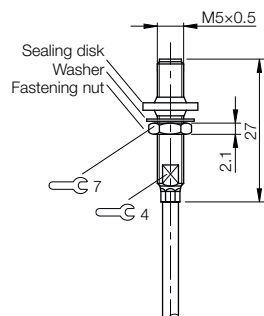
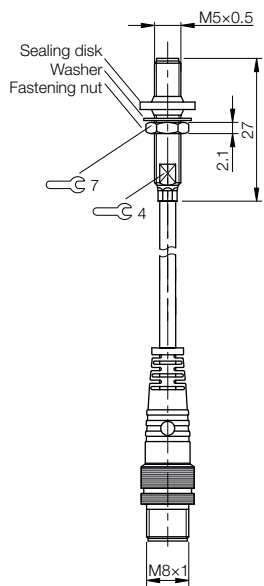
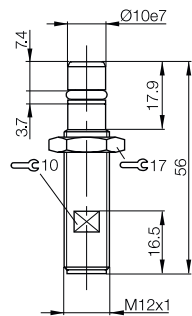
M5x0.5, M12x1



M12x1	M5x0.5	M5x0.5	M12x1
Flush	Flush	Flush	Flush
1.5 mm	0.8 mm	0.8 mm	1.5 mm
0...1.2 mm	0...0.65 mm	0...0.65 mm	0...1.2 mm
Oil pressure resistant up to 50 bar	Oil pressure resistant up to 100 bar	Oil pressure resistant up to 100 bar	Oil pressure resistant up to 100 bar
BHS003A	BES03LC	BES03L7	BHS0035
BES 516-300-S291-S4-D	BES M05ED-PSD08B-BP00,3-GS49-R03	BES M05ED-PSD08B-BP02-R03	BES 516-300-S270-S4-D
	BES03LE	BES03L8	
	BES M05ED-POD08B-BP00,3-GS49-R03	BES M05ED-POD08B-BP02-R03	
	BES03LF	BES03L9	
	BES M05ED-NSD08B-BP00,3-GS49-R03	BES M05ED-NSD08B-BP02-R03	
	BES03LH	BES03LA	
	BES M05ED-NOD08B-BP00,3-GS49-R03	BES M05ED-NOD08B-BP02-R03	
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2 V	3 V	3 V	2.5 V
75 V DC	75 V DC	75 V DC	75 V DC
200 mA	100 mA	100 mA	200 mA
150 kΩ	Open collector	Open collector	150 kΩ
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+80 °C	-25...+70 °C	-25...+70 °C	-25...+80 °C
2 kHz	3 kHz	3 kHz	2 kHz
No	IP 67	IP 67	IP 68 per BWN Pr. 20
IP 68 per BWN Pr. 20	CE, cULus	CE, cULus	CE
CE			
Stainless steel	Stainless steel	Stainless steel	Stainless steel
EP	Ceramic	Ceramic	EP
N70B200V/5.3x2.4 NBR/631753	N70B200V/5.3x2.4/178173	N70B200V/5.3x2.4/178173	N70B200V/5.3x2.4/631753
PTFE/5.3x2.4/705918			PTFE/5.3x2.4
M12 connector, 3-pin	0.3 m PUR cable with M8 connector, 3-pin	2 m PUR cable, 3x0.14 mm ²	M12 connector, 3-pin



- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- High-pressure Resistant Sensors
- Ex Sensors
- Steelface Sensors
- High Temperature Rated Sensors
- Full PTFE Sensor
- Sensors for the Food Industry
- Factor 1 Sensors
- Weld and Magnetic Field Immune Sensors
- Diagnostics Sensors
- Large Designs
- Ring Sensors
- Hose Sensors
- Analogue Distance Measurement
- Accessories



Inductive Sensors with Special Properties

High pressure rated sensors

Ø 10 mm, M12x1

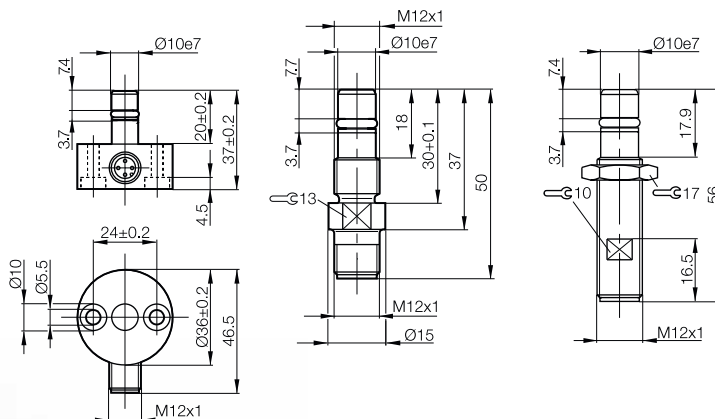
DEXYI[®]

up to 350 bar



Size	Ø 10e7	M12x1	M12x1
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush	Flush
Rated switching distance s_n	1.5 mm	1.5 mm	1.5 mm
Assured switching distance s_a	0...1.2 mm	0...1.2 mm	0...1.2 mm
Pressure range	Oil-pressure resistant up to 350 bar	Oil-pressure resistant up to 350 bar	Oil-pressure resistant up to 350 bar
PNP, NO	Ordering code	BHS004T	BHS004P
	Part number	BES 516-300-S260-S4-D	BES 516-300-S322-S4-D
Supply voltage U_s	10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.	2 V	2 V	2 V
Rated insulation voltage U_i	75 V DC	75 V DC	75 V DC
Rated operating current I_e	200 mA	200 mA	200 mA
Output resistance R_a	150 kΩ	150 kΩ	150 kΩ
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a	-25...+80 °C	-25...+80 °C	-25...+80 °C
Switching frequency f max.	2 kHz	1 kHz	1 kHz
Degree of protection as per IEC 60529	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
Approvals	CE	CE	CE
Material	Housing Stainless steel	Housing Stainless steel	Housing Stainless steel
	Sensing surface EP	Sensing surface EP	Sensing surface EP
Sealing ring material/size/replacement part number	FPM 70/5.85x2.4/636594	FPM 70/5.85x2.4/636594	FPM 70/5.85x2.4/636594
Supporting ring material/size/replacement part number	PTFE/5.3x2.4/705918	PTFE/5.3x2.4/705918	PTFE/5.3x2.4/705918
Connection	M12 connector, 3-pin	M12 connector, 4-pin	M12 connector, 4-pin

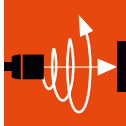
Wiring diagrams, see page 958.



Inductive Sensors with Special Properties

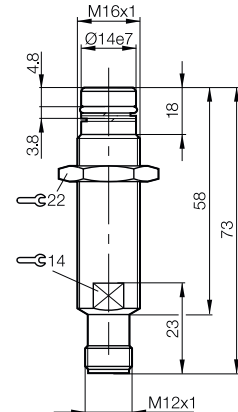
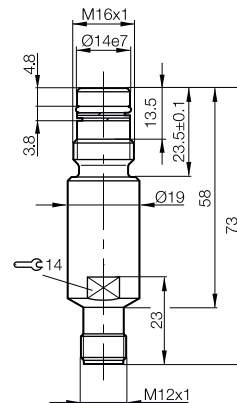
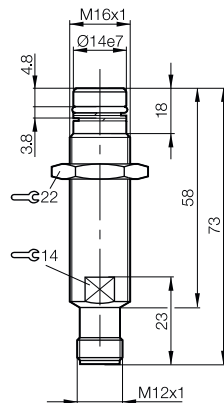
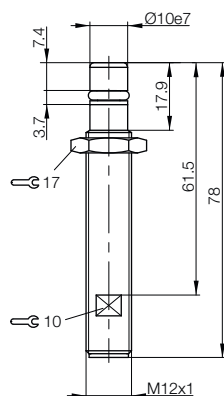
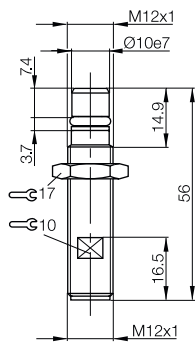
High pressure rated sensors

M12x1, M16x1



- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- High-pressure Resistant Sensors**
- Ex Sensors
- Steelface Sensors
- High Temperature Rated Sensors
- Full PTFE Sensor
- Sensors for the Food Industry
- Factor 1 Sensors
- Weld and Magnetic Field Immune Sensors
- Diagnostics Sensors
- Large Designs
- Ring Sensors
- Hose Sensors
- Analog Distance Measurement
- Accessories

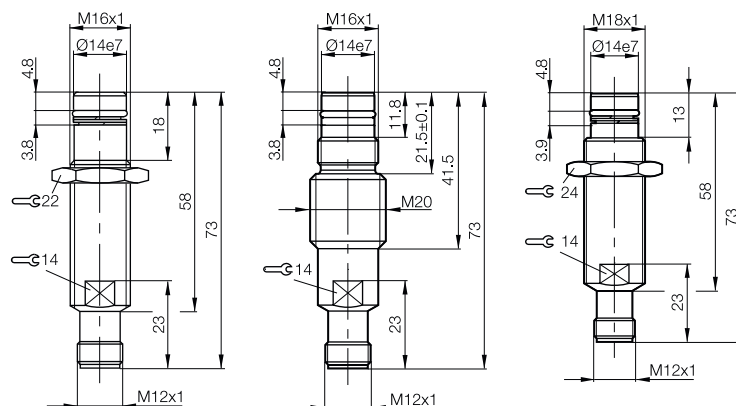
M12x1	M12x1	M16x1	M16x1	M16x1
Flush	Flush	Flush	Flush	Flush
1.5 mm	1.5 mm	1.5 mm	1.5 mm	1.5 mm
0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm
Oil-pressure resistant up to 350 bar	Oil-pressure resistant up to 350 bar	Oil-pressure resistant up to 350 bar	Oil-pressure resistant up to 350 bar	Oil-pressure resistant up to 350 bar
BHS004R	BHS004N	BHS001T	BHS001E	BHS001W
BES 516-300-S323-S4-D	BES 516-300-S321-S4-D	BES 516-300-S149-S4-D	BES 516-300-S129-S4-D	BES 516-300-S152-S4-D
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2 V	1.5 V	1.5 V	1.5 V	1.5 V
75 V DC	75 V DC	75 V DC	75 V DC	75 V DC
200 mA	200 mA	200 mA	200 mA	200 mA
150 kΩ	33 kΩ	33 kΩ	33 kΩ	33 kΩ
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+80 °C	-25...+80 °C	-25...+80 °C	-25...+80 °C	-25...+80 °C
1 kHz	1 kHz	1 kHz	1 kHz	1 kHz
IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
CE	CE	CE	CE	CE
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
EP	EP	EP	EP	EP
FPM 70/5.85x2.4/636594	FPM 70/5.85x2.4/636594	NBR 60-80/11.0x1.5/709137	NBR 60-80/11.0x1.5/709137	NBR 60-80/11.0x1.5/709137
PTFE/5.3x2.4/705918	PTFE/5.3x2.4/705918	PTFE/14x11.6x1.5/709136	PTFE/14x11.1x0.7/505953	PTFE/14x11.1x0.7/505953
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin



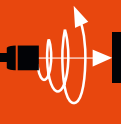


Size	M16x1	M16x1	M18x1
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush	Flush
Rated switching distance s_n	1.5 mm	1.5 mm	1.5 mm
Assured switching distance s_a	0...1.2 mm	0...1.2 mm	0...1.2 mm
Pressure range	Oil-pressure resistant up to 350 bar	Oil-pressure resistant up to 350 bar	Oil-pressure resistant up to 350 bar
PNP, NO	Ordering code	BHS001C	BHS001N
	Part number	BES 516-300-S128-S4-D	BES 516-300-S144-S4-D
PNP, NC	Ordering code	BHS001Y	
	Part number	BES 516-300-S156-S4-D	
Supply voltage U_s	10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.	1.5 V	1.5 V	1.5 V
Rated insulation voltage U_i	75 V DC	75 V DC	75 V DC
Rated operating current I_e	200 mA	200 mA	200 mA
Output resistance R_a	33 k Ω	33 k Ω	33 k Ω
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a	-25...+80 °C	-25...+80 °C	-25...+80 °C
Switching frequency f max.	1 kHz	1 kHz	1 kHz
Output function indicator			
Degree of protection as per IEC 60529	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
Approvals	CE	CE	CE
Material	Housing: Stainless steel	Housing: Stainless steel	Housing: Stainless steel
	Sensing surface: EP	Sensing surface: EP	Sensing surface: EP
Sealing ring material/size/replacement part number	NBR 60-80/11.0x1.5/709137	NBR 60-80/11.0x1.5/709137	NBR 60-80/11.0x1.5/709137
Supporting ring material/size/replacement part number	PTFE/14x11.6x1.5/709136	PTFE/14x11.1x0.7/505953	PTFE/14x11.1x0.7/505953
Connection	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

Wiring diagrams, see page 958.

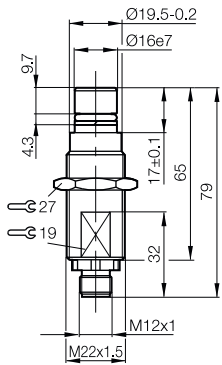


Inductive Sensors with Special Properties
High-pressure resistant sensors
M22x1.5



M22x1.5				
Flush				
3 mm				
0...2.1 mm				
Oil-pressure resistant up to 350 bar				
BHS0036				
BES 516-300-S271-S4				
10...30 V DC				
1.5 V				
75 V DC				
200 mA				
4.7 kΩ				
Yes/No/No				
0...+85 °C				
500 Hz				
Yellow LED				
IP 68 per BWN Pr. 20				
CE				
Stainless steel				
POM				
FPM 70/10.77x2.62/712143				
PTFE, 16x11.5x1.4/619072				
M12 connector, 4-pin				

- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- High-pressure Resistant Sensors**
- Ex Sensors
- Steelface Sensors
- High Temperature Rated Sensors
- Full PTFE Sensor
- Sensors for the Food Industry
- Factor 1 Sensors
- Weld and Magnetic Field Immune Sensors
- Diagnostics Sensors
- Large Designs
- Ring Sensors
- Hose Sensors
- Analogue Distance Measurement
- Accessories

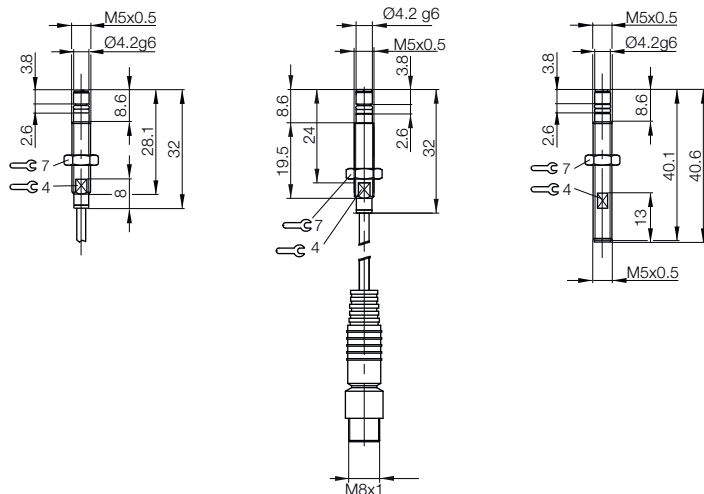




Size	M5x0.5	M5x0.5	M5x0.5
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush	Flush
Rated switching distance s_n	1 mm	1 mm	1 mm
Assured switching distance s_a	0...0.8 mm	0...0.8 mm	0...0.8 mm
Pressure range	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar
PNP, NO	Ordering code Part number	BHS006U BHS G409N-PSD10-EP02	BHS006N BHS G403N-PSD10-S26
PNP, NC	Ordering code Part number	BHS006W BHS G409N-POD10-EP02	BHS006P BHS G403N-POD10-S26
NPN, NO	Ordering code Part number	BHS006Y BHS G409N-NSD10-EP02	BHS006R BHS G403N-NSD10-S26
NPN, NC	Ordering code Part number		
Supply voltage U_s	10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.	2.5 V	2.5 V	2.5 V
Rated insulation voltage U_i	75 V DC	75 V DC	75 V DC
Rated operating current I_e	100 mA	100 mA	100 mA
Output resistance R_a	Open collector	Open collector	Open collector
Polarity reversal protected/transposition protected/short-circuit protected	Yes/No/Yes	Yes/No/Yes	Yes/No/Yes
Ambient temperature T_a	-25...+80 °C	-25...+80 °C	-25...+80 °C
Switching frequency f max.	3 kHz	3 kHz	3 kHz
Output function indicator			
Degree of protection as per IEC 60529	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
Approvals	CE	CE	CE
Material	Housing: Stainless steel Sensing surface: ZrO ₂	Housing: Stainless steel Sensing surface: ZrO ₂	Housing: Stainless steel Sensing surface: ZrO ₂
Sealing ring material/size/replacement part number	NBR 70/2.35x1/154783	NBR 70/2.35x1/154783	NBR 70/2.35x1/154783
Supporting ring material/size/replacement part number	PTFE/4.2x0.65x1/154782	PTFE/4.2x0.65x1/154782	PTFE/4.2x0.65x1/154782
Connection	2 m PUR cable, 3x0.1 mm ²	0.3 m PUR cable with M8 connector, 3-pin	M5 connector, 3-pin

Wiring diagrams, see page 958.

Additional cable lengths on request



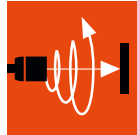
Inductive Sensors with Special Properties

High pressure rated sensors

M5x0.5, M8x1



M5x0.5	M8x1	M8x1	M8x1	M8x1
Flush	Flush	Flush	Flush	Flush
1 mm	1.5 mm	1.5 mm	1.5 mm	1.5 mm
0...0.8 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm
Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar
BHS005H	BHS0054	BHS0050	BHS0058	
BHS G408N-PSC10-S49	BHS A404N-PSC15-S49	BHS A402N-PSC15-S49	BHS A407N-PSD15-BP02	
BHS005F	BHS0053	BHS004Y	BHS0057	
BHS G408N-POC10-S49	BHS A404N-POC15-S49	BHS A402N-NSC15-S49	BHS A407N-POD15-BP02	
BHS005E	BHS0052	BHS004Z	BHS0056	
BHS G408N-NSC10-S49	BHS A404N-NSC15-S49	BHS A402N-POC15-S49	BHS A407N-NSD15-BP02	
	BHS0051	BHS004W	BHS0055	
	BHS A404N-NOC15-S49	BHS A402N-NOC15-S49	BHS A407N-NOD15-BP02	
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	
2.5 V	2.5 V	2.5 V	2.5 V	
75 V DC	75 V DC	75 V DC	75 V DC	
100 mA	100 mA	100 mA	100 mA	
Open collector	Open collector	Open collector	Open collector	
Yes/No/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	
-25...+80 °C	0...+80 °C	-25...+80 °C	-25...+80 °C	
3 kHz	4 kHz	4 kHz	4 kHz	
Yellow LED	Yellow LED	Yellow LED	Yellow LED	
IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	
CE	CE	CE	CE	
Stainless steel	Stainless steel	Stainless steel	Stainless steel	
ZrO ₂	ZrO ₂	ZrO ₂	ZrO ₂	
NBR 70/2.35x1/154783	NBR 70/4x1.5/154149	NBR 70/4x1.5/154149	NBR 70/4x1.5/154149	
PTFE/4.2x0.65x1/154782	PTFE/5.3x2.4/154150	PTFE/5.3x2.4/154150	PTFE/5.3x2.4/154150	
M8 connector, 3-pin	M8 connector, 3-pin	M8 connector, 3-pin	M8 connector, 3-pin	



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

AC 2-wire

Special Properties

High-pressure Resistant Sensors

Ex Sensors

Steelface Sensors

High Temperature Rated Sensors

Full PTFE Sensor

Sensors for the Food Industry

Factor 1 Sensors

Weld and Magnetic Field Immune Sensors

Diagnostics Sensors

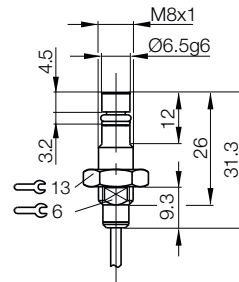
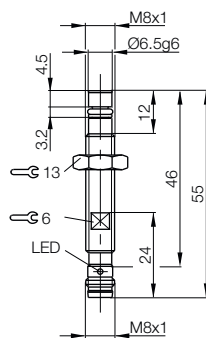
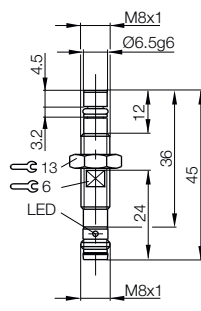
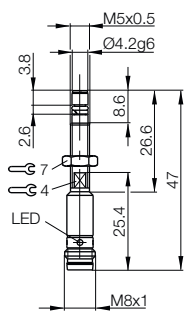
Large Designs

Ring Sensors

Hose Sensors

Analog Distance Measurement

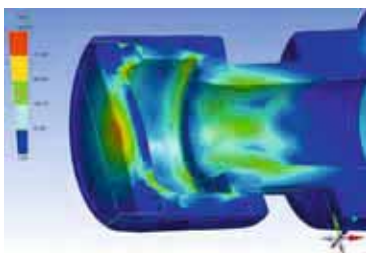
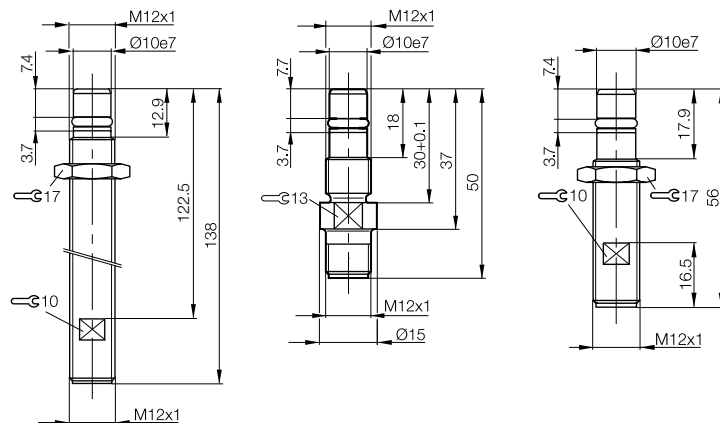
Accessories



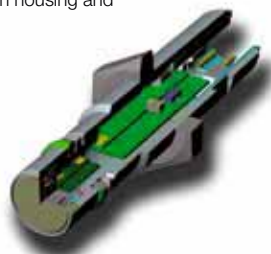


Size	M12x1	M12x1	M12x1	
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush	Flush	
Rated switching distance s_n	1.5 mm	1.5 mm	1.5 mm	
Assured switching distance s_a	0...1.2 mm	0...1.2 mm	0...1.2 mm	
Pressure range	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	
PNP, NO	Ordering code	BHS0023	BHS0032	
	Part number	BES 516-300-S164-S4-D	BES 516-300-S262-S4-D	
PNP, NC	Ordering code			BHS004F
	Part number			BES 516-300-S305-S4-D
Supply voltage U_s	10...30 V DC	10...30 V DC	10...30 V DC	
Voltage drop U_d at I_e max.	1.5 V	2 V	2 V	
Rated insulation voltage U_i	75 V DC	75 V DC	75 V DC	
Rated operating current I_e	200 mA	200 mA	200 mA	
Output resistance R_a	33 k Ω	150 k Ω	150 k Ω	
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	
Ambient temperature T_a	-25...+80 °C	-25...+90 °C	-25...+80 °C	
Switching frequency f max.	1 kHz	2 kHz	2 kHz	
Degree of protection as per IEC 60529	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	
Approvals	CE	CE	CE	
Material	Housing	Stainless steel	Stainless steel	Stainless steel
	Sensing surface	EP	EP	EP
Sealing ring material/size/replacement part number	N70B200V/5.3x2.4/631753	N70B200V/5.3x2.4/631753	N70B200V/5.3x2.4/631753	
Supporting ring material/size/replacement part number	PTFE/5.3x2.4/705918	PTFE/5.3x2.4/705918	PTFE/5.3x2.4/705918	
Connection	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	

Wiring diagrams, see page 958.



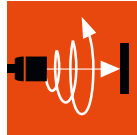
Simulation (FEM method) of the stress distribution under high pressure on housing and ceramic cap



Inductive Sensors with Special Properties

High-pressure resistant sensors

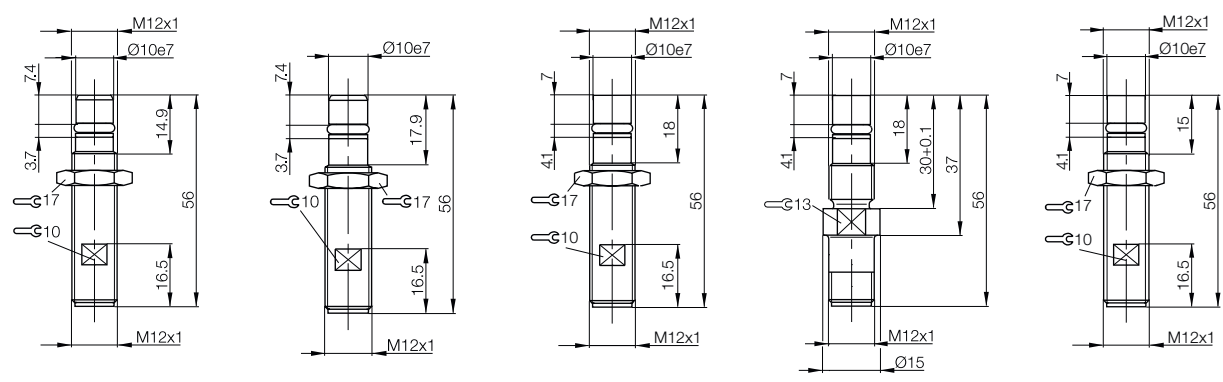
M12x1



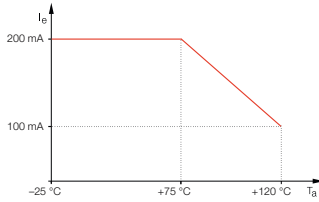
- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- High-pressure Resistant Sensors**
- Ex Sensors
- Steelface Sensors
- High-temperature Rated Sensors
- Full PTFE Sensor
- Sensors for the Food Industry
- Factor 1 Sensors
- Weld and Magnetic Field Immune Sensors
- Diagnostics Sensors
- Large Designs
- Ring Sensors
- Hose Sensors
- Analog Distance Measurement
- Accessories



M12x1	M12x1	M12x1	M12x1	M12x1
Flush	Flush	Flush	Flush	Flush
1.5 mm	1.5 mm	1.5 mm	1.5 mm	1.5 mm
0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm
Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar
BHS0033	BHS002Y	BHS005Y	BHS0063	BHS0061
BES 516-300-S265-S4-D	BES 516-300-S249-S4-D	BHS B249V-PSD15-S04	BHS B400V-PSD15-S04	BHS B265V-PSD15-S04
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2 V	2 V	2.5 V	2.5 V	2.5 V
75 V DC	75 V DC	75 V DC	75 V DC	75 V DC
200 mA	200 mA	200 mA	200 mA	200 mA
150 kΩ	150 kΩ	33 kΩ	33 kΩ	33 kΩ
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+80 °C	-25...+80 °C	-25...+120 °C*	-25...+120 °C*	-25...+120 °C*
2 kHz	2 kHz	400 Hz	400 Hz	400 Hz
IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
CE	CE	CE	CE	CE
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
EP	EP	Ceramic	Ceramic	Ceramic
N70B200V/5.3x2.4/631753	N70B200V/5.3x2.4 NBR/631753	FPM 80/6.75x1.78/149621	FPM 80/6.75x1.78/149621	FPM 80/6.75x1.78/123170
PTFE/5.3x2.4/705918	PTFE/5.3x2.4/705918	PTFE/10x7.0x1.8/150229	PTFE/10x7.0x1.8/150229	PTFE/10x7.0x1.8/150229
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin



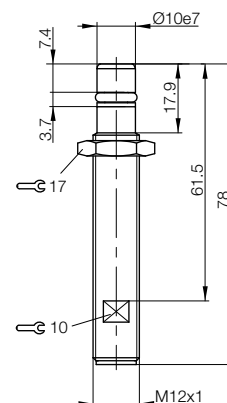
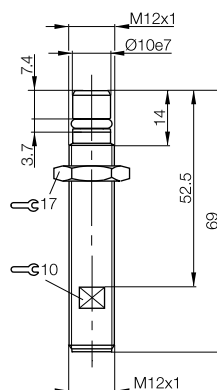
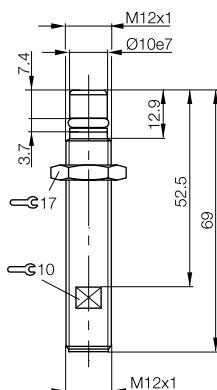
*Current reduction as a function of ambient temperature range





Size	M12x1	M12x1	M12x1
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush	Flush
Rated switching distance s_n	1.5 mm	1.5 mm	1.5 mm
Assured switching distance s_a	0...1.2 mm	0...1.2 mm	0...1.2 mm
Pressure range	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar
PNP, NO	Ordering code Part number		BHS001L BES 516-300-S135-S4-D
PNP, complementary	Ordering code Part number		
NPN, NO	Ordering code Part number	BHS0037 BES 516-300-S281-S4-D	
Supply voltage U_s	10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.	2 V	1.5 V	1.5 V
Rated insulation voltage U_i	75 V DC	75 V DC	75 V DC
Rated operating current I_e	200 mA	200 mA	200 mA
Output resistance R_a	150 k Ω	33 k Ω	33 k Ω
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a	-25...+80 °C	-25...+80 °C	-25...+80 °C
Switching frequency f max.	2 kHz	1 kHz	1 kHz
Degree of protection as per IEC 60529	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
Approvals	CE	CE	CE
Material	Housing: Stainless steel Sensing surface: EP	Housing: Stainless steel Sensing surface: EP	Housing: Stainless steel Sensing surface: EP
Sealing ring material/size/replacement part number	N70B200V/5.3x2.4/631753	N70B200V/5.3x2.4/631753	FPM 70/5.85x2.4/636594
Supporting ring material/size/replacement part number	PTFE/5.3x2.4/705918	PTFE/5.3x2.4/705918	PTFE/5.3x2.4/705918
Connection	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

Wiring diagrams, see page 958.



Inductive Sensors with Special Properties

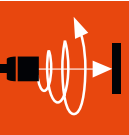
High-pressure resistant sensors

M12x1

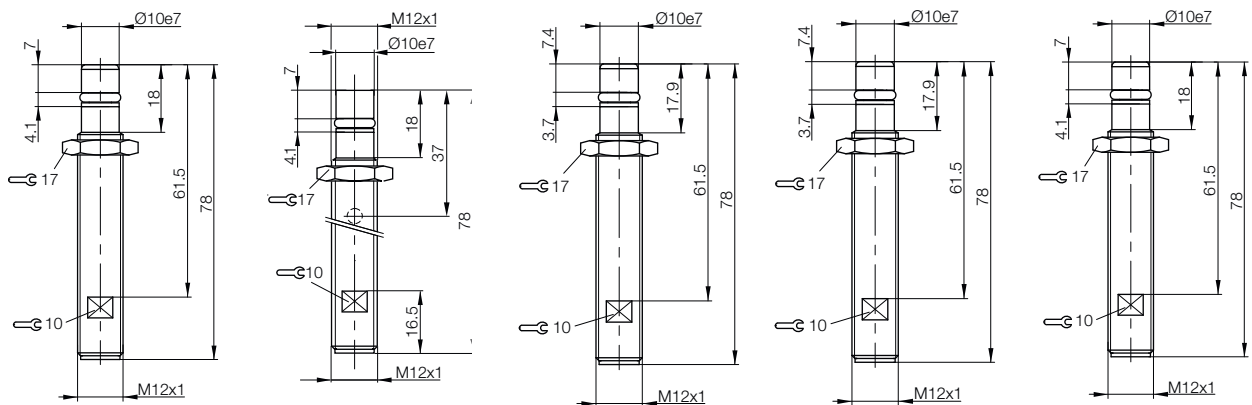


With temperature output

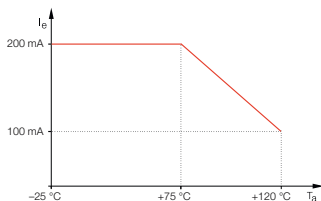
M12x1	M12x1	M12x1	M12x1	M12x1
Flush	Flush	Flush	Flush	Flush
1.5 mm	1.5 mm	1.5 mm	1.5 mm	1.5 mm
0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm
Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar
BHS005R	BHS005T		BHS0049	
BHS B135V-PSD15-S04	BHS B135V-PSD15-S04-T01		BES 516-300-S298-S4-D	
		BHS0001		BHS0076
		BES 516-100-S45-S4-D		BHS B135V-PAD15-S04-007
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2.5 V	2.5 V	1.5 V	1.5 V	2.5 V
75 V DC	75 V DC	75 V DC	75 V DC	75 V DC
200 mA	200 mA	200 mA	200 mA	200 mA
33 kΩ	33 kΩ	33 kΩ	33 kΩ	33 kΩ
Yes/Yes/Yes	Yes/No/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+120 °C*	-25...+120 °C*	-25...+80 °C	-25...+80 °C	-25...+85 °C
400 Hz	400 Hz	1 kHz	1 kHz	1.5 kHz
IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
CE	CE	CE	CE	CE
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Ceramic	Ceramic	EP	EP	Ceramic
FPM 80/6.75x1.78/149621	FPM 80/6.75x1.78/123170	FPM 70/5.85x2.4/636594	FPM 70/5.85x2.4/636594	FPM 80/6.75x1.78/149621
PTFE/10x7.0x1.8/150229	PTFE/10x7.0x1.8/150229	PTFE/5.3x2.4/705918	PTFE/5.3x2.4/705918	PTFE/10x7.0x1.8/150229
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin



- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- High-pressure Resistant Sensors
- Ex Sensors
- Steelface Sensors
- High Temperature Rated Sensors
- Full PTFE Sensor
- Sensors for the Food Industry
- Factor 1 Sensors
- Weld and Magnetic Field Immune Sensors
- Diagnostics Sensors
- Large Designs
- Ring Sensors
- Hose Sensors
- Analogue Distance Measurement
- Accessories



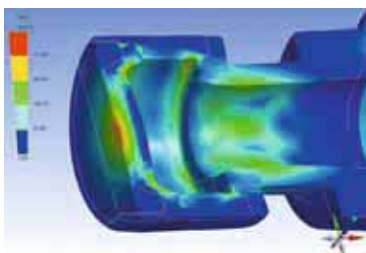
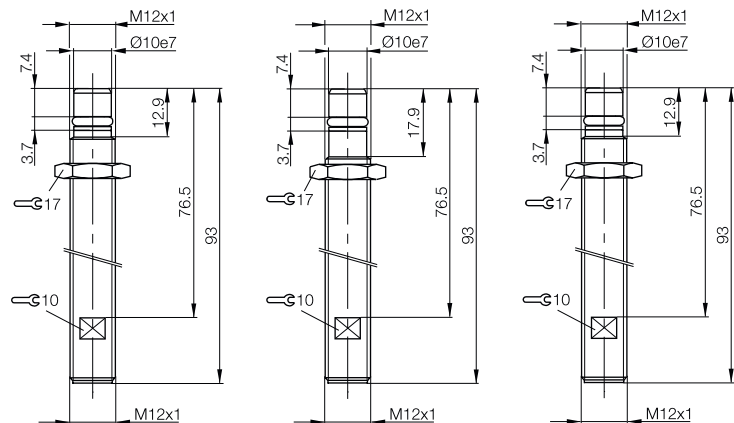
*Current reduction as a function of ambient temperature range



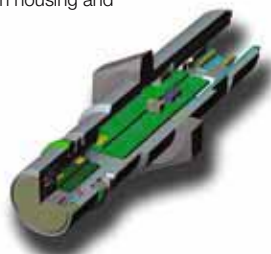


Size	M12x1	M12x1	M12x1
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush	Flush
Rated switching distance s_n	1.5 mm	1.5 mm	1.5 mm
Assured switching distance s_a	0...1.2 mm	0...1.2 mm	0...1.2 mm
Pressure range	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar
PNP, NO	Ordering code	BHS0022	BHS004C
	Part number	BES 516-300-S163-S4-D	BES 516-300-S300-S4-D
NPN, NO	Ordering code		BHS002U
	Part number		BES 516-300-S242-S4-D
Supply voltage U_S	10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.	1.5 V	1.5 V	1.5 V
Rated insulation voltage U_i	75 V DC	75 V DC	75 V DC
Rated operating current I_e	200 mA	200 mA	200 mA
Output resistance R_a	33 k Ω	33 k Ω	33 k Ω
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a	-25...+80 °C	-25...+80 °C	-25...+80 °C
Switching frequency f max.	1 kHz	1 kHz	1 kHz
Degree of protection as per IEC 60529	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
Approvals	CE	CE	CE
Material	Housing	Stainless steel	Stainless steel
	Sensing surface	EP	EP
Sealing ring material/size/replacement part number	N70B200V/5.3x2.4/631753	N70B200V/5.3x2.4/631753	N70B200V/5.3x2.4/631753
Supporting ring material/size/replacement part number	PTFE/5.3x2.4/705918	PTFE/5.3x2.4/705918	PTFE/5.3x2.4/705918
Connection	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

Wiring diagrams, see page 958.



Simulation (FEM method) of the stress distribution under high pressure on housing and ceramic cap



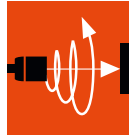
Inductive Sensors with Special Properties

High-pressure resistant sensors

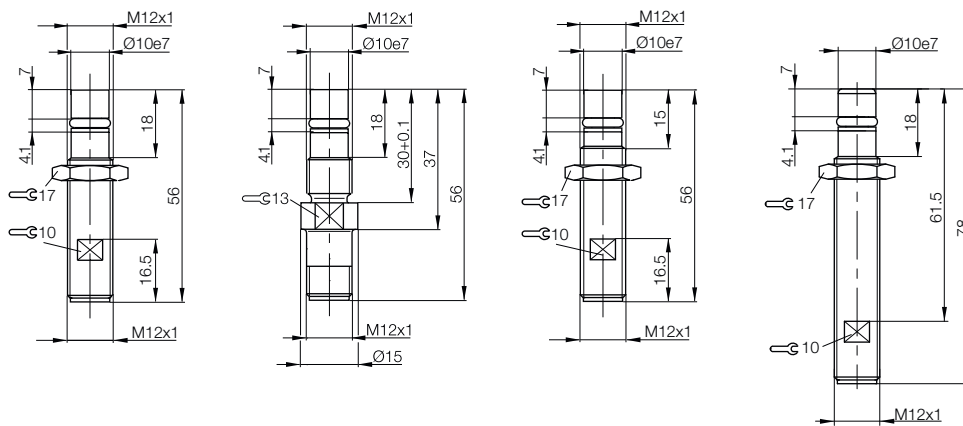
M12x1



M12x1	M12x1	M12x1	M12x1	
Flush	Flush	Flush	Flush	
2.5 mm	1.5 mm	2.5 mm	2.5 mm	
0...2 mm	0...2 mm	0...2 mm	0...2 mm	
Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	
BHS0060	BHS0065	BHS0062	BHS005U	
BHS B249V-PSD25-S04-003	BHS B400V-PSD25-S04-003	BHS B265V-PSD25-S04-003	BHS B135V-PSD25-S04-003	
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	
2.5 V	2.5 V	2.5 V	2.5 V	
75 V DC	75 V DC	75 V DC	75 V DC	
200 mA	200 mA	200 mA	200 mA	
33 kΩ	33 kΩ	33 kΩ	33 kΩ	
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	
-25...+90 °C	-25...+90 °C	-25...+90 °C	-25...+90 °C	
400 Hz	400 Hz	400 Hz	400 Hz	
IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	
CE	CE	CE	CE	
Stainless steel	Stainless steel	Stainless steel	Stainless steel	
Ceramic	Ceramic	Ceramic	Ceramic	
FPM 80/6.75x1.78/149621	FPM 80/6.75x1.78/149621	FPM 80/6.75x1.78/149621	FPM 80/6.75x1.78/149621	
PTFE/10x7.0x1.8/150229	PTFE/10x7.0x1.8/150229	PTFE/10x7.0x1.8/150229	PTFE/10x7.0x1.8/150229	
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	



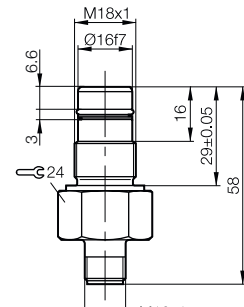
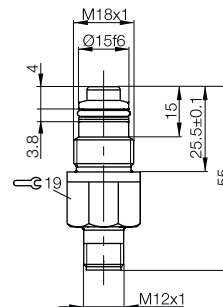
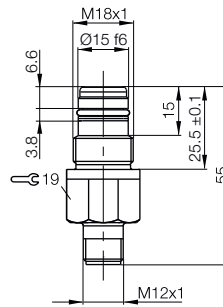
- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- High-pressure Resistant Sensors**
- Ex Sensors
- Steelface Sensors
- High-temperature Rated Sensors
- Full PTFE Sensor
- Sensors for the Food Industry
- Factor 1 Sensors
- Weld and Magnetic Field Immune Sensors
- Diagnostics Sensors
- Large Designs
- Ring Sensors
- Hose Sensors
- Analogue Distance Measurement
- Accessories



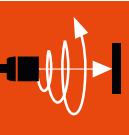


Size	M18x1	M18x1	M18x1
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush	Flush
Rated switching distance s_n	1.5 mm	1.5 mm	3 mm
Assured switching distance s_a	0...1.2 mm	0...1.2 mm	0...2.1 mm
Pressure range	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar
PNP, NO	Ordering code	BHS004A	BHS004J
	Part number	BES 516-300-S299-S4-D	BES 516-300-S308-S4-D
Supply voltage U_s	10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.	2 V	2 V	3.5 V
Rated insulation voltage U_i	75 V DC	75 V DC	75 V DC
Rated operating current I_e	200 mA	200 mA	130 mA
Output resistance R_a	150 k Ω	150 k Ω	2 k Ω
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a	-25...+80 °C	-25...+80 °C	-25...+80 °C
Switching frequency f max.	2 kHz	2 kHz	400 Hz
Degree of protection as per IEC 60529	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
Approvals	CE	CE	CE
Material	Housing Stainless steel	Housing Stainless steel	Housing Stainless steel
	Sensing surface EP	Sensing surface EP	Sensing surface PEEK
Sealing ring material/size/replacement part number	NBR 60-80/12.42x1.78/642828	NBR 60-80/12.42x1.78/642828	NBR 90/13.0x1.5/619531
Supporting ring material/size/replacement part number	PTFE/15x12.2x0.7/642827	PTFE/15x12.2x0.7/642827	PTFE/16x13.8x0.5/635431
Connection	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

Wiring diagrams, see page 958.

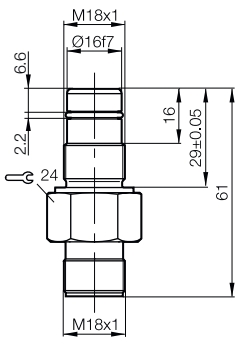


Inductive Sensors with Special Properties
High pressure resistant sensors
M18x1



M18x1				
Flush				
3 mm				
0...2.1 mm				
Oil pressure resistant up to 500 bar				
BHS0027				
BES 516-300-S203				
10...30 V DC				
3.5 V				
75 V DC				
130 mA				
4.7 kΩ				
Yes/Yes/Yes				
-25...+80 °C				
1 kHz				
IP 68 per BWN Pr. 20				
CE				
Stainless steel				
PEEK				
NBR 90/13.0x1.5/619531				
M18 connector, 4-pin				

- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- High-pressure Resistant Sensors**
- Ex Sensors
- Steelface Sensors
- High Temperature Rated Sensors
- Full PTFE Sensor
- Sensors for the Food Industry
- Factor 1 Sensors
- Weld and Magnetic Field Immune Sensors
- Diagnostics Sensors
- Large Designs
- Ring Sensors
- Hose Sensors
- Analogue Distance Measurement
- Accessories



Inductive Sensors with Special Properties
High pressure rated sensors, EX protected
M12x1

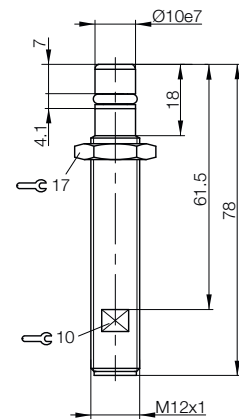
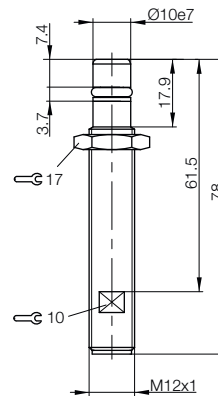


up to 500 bar
EX



Size	M12x1	M12x1
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush
Rated switching distance s_n	1.5 mm	1.5 mm
Assured switching distance s_a	0...1.2 mm	0...1.2 mm
Pressure range	Oil-pressure resistant up to 350 bar	Oil pressure resistant up to 500 bar
PNP, NO	BHS004M	BHS0031
Ordering code		
Part number	BES 516-300-S321-NEX-S4-D	BES 516-300-S262-NEX-S4-D
Supply voltage U_s	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.	1.5 V	2 V
Rated insulation voltage U_i	75 V DC	75 V DC
Rated operating current I_e	200 mA	200 mA
Output resistance R_a	33 k Ω	150 k Ω
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a	-25...+80 °C	-25...+90 °C
Switching frequency f max.	1 kHz	2 kHz
Degree of protection as per IEC 60529	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
Approvals	CE	CE
Material		
Housing	Stainless steel	Stainless steel
Sensing surface	EP	EP
Sealing ring material/size/replacement part number	FPM 70/5.85x2.4/636594	N70B200V/5.3x2.4/631753
Supporting ring material/size/replacement part number	PTFE/5.3x2.4/705918	PTFE/5.3x2.4/705918
Connection	M12 connector, 4-pin	M12 connector, 4-pin

Wiring diagrams, see page 958.



Sensors with ATEX approval Category 3G

Devices in this category are designed for use in areas where explosive atmospheres occur infrequently (Zone 2).

Before design, installation and startup, please read the user's guide found at www.balluff.com.

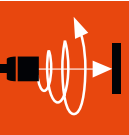
Inductive Sensors with Special Properties

High pressure rated sensors, Ex protected

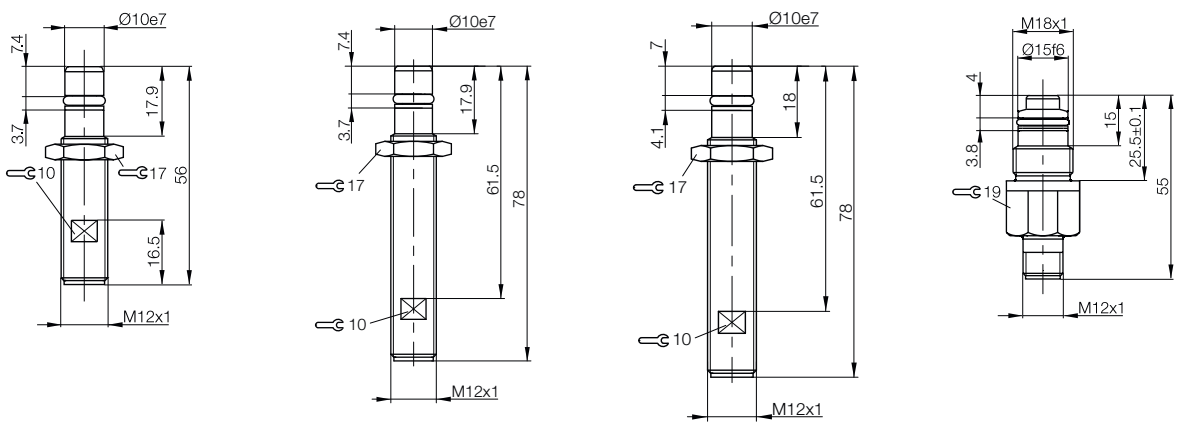
M12x1, M18x1



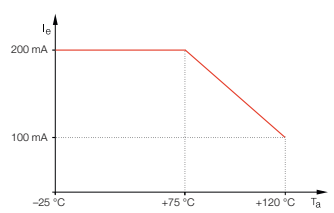
M12x1	M12x1	M12x1	M18x1
Flush	Flush	Flush	Flush
1.5 mm	1.5 mm	1.5 mm	1.5 mm
0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm
Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar
BHS002W	BHS001K	BHS005P	BHS004H
BES 516-300-S249-NEX-S4-D	BES 516-300-S135-NEX-S4-D	BHS B135V-PSD15-NEX-S04	BES 516-300-S308-NEX-S4-D
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2 V	1.5 V	2.5 V	2 V
75 V DC	75 V DC	75 V DC	75 V DC
200 mA	200 mA	200 mA	200 mA
150 kΩ	33 kΩ	33 kΩ	150 kΩ
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+80 °C	-25...+80 °C	-25...+120 °C*	-25...+80 °C
2 kHz	1 kHz	400 Hz	2 kHz
IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
CE	CE	CE	CE
Stainless steel	Stainless steel	Stainless steel	Stainless steel
EP	EP	Ceramic	EP
N70B200V/5.3x2.4/631753	FPM 70/5.85x2.4/636594	FPM 80/6.75x1.78/149621	NBR 60-80/12.42x1.78/642828
PTFE/5.3x2.4/705918	PTFE/5.3x2.4/705918	PTFE/10x7.0x1.8/150229	PTFE/15x12.2x0.7/642827
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin



- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- High-pressure Resistant Sensors
- Ex Sensors
- Steelface Sensors
- High Temperature Rated Sensors
- Full PTFE Sensor
- Sensors for the Food Industry
- Factor 1 Sensors
- Weld and Magnetic Field Immune Sensors
- Diagnostics Sensors
- Large Designs
- Ring Sensors
- Hose Sensors
- Analogue Distance Measurement
- Accessories



*Current reduction as a function of ambient temperature range



Inductive Sensors with Special Properties

NAMUR, high pressure rated sensors, EX protected M12x1

DEXYI[®]

NAMUR

High Pressure Rated

EX

Ignition protection type
"intrinsically safe" used with
switching amplifier outside
the Ex area

Inductive sensors to NAMUR specification consist essentially of an oscillator with a dampable oscillator coil and a demodulator.

These high pressure sensors are used, for example, in end-of-travel monitoring on hydraulic cylinders or position detection on valves.

They can be used in conjunction with suitable isolating amplifiers, such as from STAHL (see page 603), in potentially explosive systems or spaces classified as Zone 1 or 2. The isolating amplifier must be installed only outside the explosive area.

Note

Before design, installation and startup, please read the user's guide found at www.balluff.com. You must also observe the requirements for the EC Type Examination Certificate.

Ignition protection type
"intrinsically safe"



Size	M12x1	M12x1
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush
Rated switching distance s_n	1.5 mm	1.5 mm
Assured switching distance s_a	0...1.2 mm	0...1.2 mm
NAMUR	Ordering code	BHS004L
	Part number	BES 516-300-S318-S4-N
	Part number	BES 516-300-S315-S4-N
Rated operating voltage U_e	8.2 V DC	8.2 V DC
Supply voltage U_s	7.7...9 V DC	7.7...9 V DC
Rated insulation voltage U_i	75 V DC	75 V DC
Current consumption at $s_r = 0$	≤ 1 mA	≤ 1 mA
consumption at $s_r = \infty$	≥ 4 mA	≥ 4 mA
Rated series resistance R_V	1000 Ω	1000 Ω
Permissible series resistance R_V	550...1100 Ω	550...1100 Ω
Output signal:	Current change (no trigger response)	Current change (no trigger response)
Fully undamped	≥ 4 mA	≥ 4 mA
Fully damped	≤ 1 mA	≤ 1 mA
Polarity reversal protected < 9 V	Yes	Yes
Ambient temperature T_a	-25...+70 °C	-25...+70 °C
Switching frequency f	1 kHz	1 kHz
Degree of protection as per IEC 60529	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
Material	Housing: Stainless steel	Housing: Stainless steel
	Sensing surface: POM	Sensing surface: POM
Connection	M12 connector, 4-pin	M12 connector, 4-pin
O-ring/spare part number	5.85x2.4/636594	5.85x2.4/636594
Support ring/spare part number	10x5.9x1/705918	10x5.9x1/705918
Pressure rated (hydraulic) up to	500 bar	500 bar

Ex area		
Conformity to standards	EN 60079-0:2004 EN 50020:2002	EN 60079-0:2004 EN 50020:2002
For additional data see -EC Type Examination Certificate.	PTB 01 ATEX 2207 X	PTB 01 ATEX 2207 X
Designation	EX II 2 G EX ia IIC T6	EX II 2 G EX ia IIC T6
Effective internal capacitance	≤ 30 nF	≤ 30 nF
Effective internal inductance	≤ 0.5 mH	≤ 0.5 mH
Maximum input power P_i	200 mW	200 mW

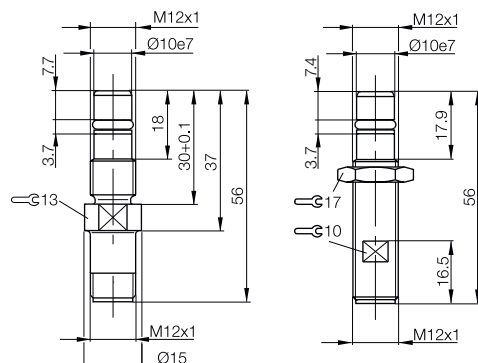
For additional data see
EC Type Examination Certificate.

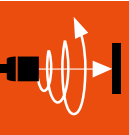


Sensors with ATEX approval Category 2G

Devices in this category are designed for use in areas where explosive atmospheres occur for short periods (Zone 1).

Before design, installation and startup, please read the user's guide found at www.balluff.com.





- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire

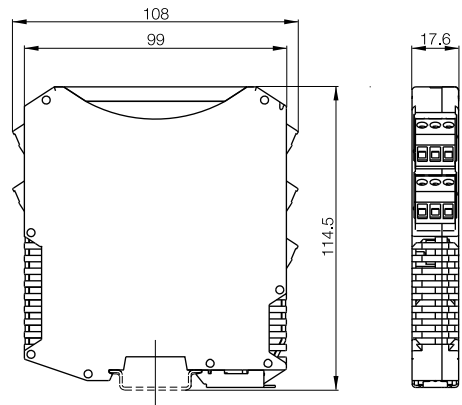
- Special Properties
- High-pressure Resistant Sensors
- Ex Sensors
- Steelface Sensors
- High Temperature Rated Sensors
- Full PTFE Sensor
- Sensors for the Food Industry
- Factor 1 Sensors
- Weld and Magnetic Field Immune Sensors
- Diagnostics Sensors
- Large Designs
- Ring Sensors
- Hose Sensors

- Analogue Distance Measurement
- Accessories

Size	99×17.6×114.5 mm	99×17.6×114.5 mm
Ordering code	FHW004P	FHW004R
Part number	STAHL 9170/20-12-11S	STAHL 9170/20-12-21S
Input	NAMUR-specification	NAMUR-specification
Output relay	2-channel, 1 converter Switching voltage 250 V AC Switching current 4 A AC Switching capacity 50 W/1000 VA	2-channel, 1 converter Switching voltage 250 V AC Switching current 4 A AC Switching capacity 50 W/1000 VA
Function change	via switch	via switch
Supply voltage U _S	24 V DC	120...230 V AC
Ambient temperature T _a	-20...+60 °C	-20...+60 °C
Relative humidity	≤ 95 %, no condensation	≤ 95 %, no condensation

EX area	
Designation	EX II (1) GD [EEx ia] IIC/IIB and EX II 3 G EEx nAC II T4
EC Type Examination Certificate	DMT 02 ATEX E 195 X

For safety and other data see
EC- Type Examination Certificate.

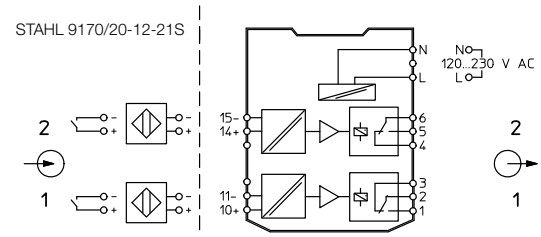
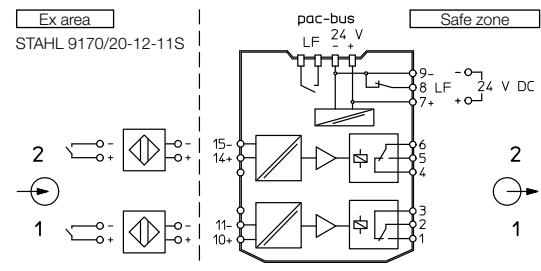


The switch amplifier with relay output serves as the interface between electrical signals from the hazardous area (EX- zone) and the non-hazardous area (safe zone). The input signals from NAMUR-sensors are converted using relay switching contacts-at the outputs. Input, output and auxiliary power circuits are galvanically isolated.

Important!
 Before design, installation and startup, please read the operating manual found at www.stahl.de.

You must also observe the requirements for the EC- Type Examination Certificate.

Wiring diagrams



Inductive Sensors with Special Properties

NAMUR, EX-protected

Ø 6.5 mm, M8x1



NAMUR EX



Ignition protection type "intrinsically safe" used with isolating amplifier outside the Ex area

Inductive sensors to NAMUR specification consist essentially of an oscillator with a dampable oscillator coil and a de-modulator.

These sensors can be used in conjunction with suitable isolating amplifiers such as from STAHL (see page 603) in explosive systems or zones (see ATEX-marking). The isolating amplifier must be installed only outside the explosive area.

Note

Before design, installation and startup, please read the user's guide found at www.balluff.com. You must also observe the requirements for the EC-Type Examination Certificate.

Ignition protection type "intrinsically safe"  



Size	Ø 6.5 mm	M8x1
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush
Rated switching distance s_n	1 mm	1 mm
Assured switching distance s_a	0.8 mm	0...0.8 mm
NAMUR	Ordering code	BES02ZR
	Part number	BES G06MD-GNX10B-EV02-EEX
		BES02ZT
		BES M08MD-GNX10B-EV02-EEX
Rated operating voltage U_e	8.2 V DC	8.2 V DC
Supply voltage U_s	7.7...9 V DC	7.7...9 V DC
Rated insulation voltage U_i	75 V DC	75 V DC
Current consumption	Current change (no trigger response)	Current change (no trigger response)
	self-locking (undamped)	self-locking (undamped)
	conductive (damped)	conductive (damped)
	≤ 1 mA	≤ 1 mA
	≥ 2.1 mA	≥ 2.1 mA
Rated series resistance R_V	1 k Ω	1 k Ω
Polarity reversal protected	no*	no*
Ambient temperature T_a	-20...+70 °C	-20...+70 °C
Switching frequency f	2 kHz	2 kHz
Function indicator	No	No
Degree of protection as per IEC 60529	IP 67	IP 67
Material	Housing	Housing
	Sensing surface	Sensing surface
	Brass-coated	Brass-coated
	PBT	PBT
Possible installation variations		
Connection	2 m PVC cable, 2x0.14 mm ²	2 m PVC cable, 2x0.14 mm ²

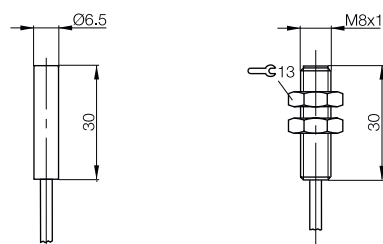
Ex area	Ø 6.5 mm	M8x1
Conformity to standards	EN 50014:1997+A1+A2 EN 50020	EN 50014:1997+A1+A2 EN 50020
For additional data see -EC Type Examination Certificate.	BVS 05 ATEX E 163 PTB 05 ATEX 2075	BVS 05 ATEX E 163 PTB 05 ATEX 2075
Designation	Ex II 2G EEx ia IIC T6 Ex II 1D Ex iaD 20 T90°C	Ex II 2G EEx ia IIC T6 Ex II 1D Ex iaD 20 T90°C
Maximum internal capacitance	80 nF	80 nF
Maximum internal inductance	0.07 mH	0.07 mH
Connected to approved intrinsically safe circuits with the highest values	U = 15 V I = 50 mA P = 120 mW	U = 15 V I = 50 mA P = 120 mW

*Power restriction when using an approved intrinsically safe isolating amplifier

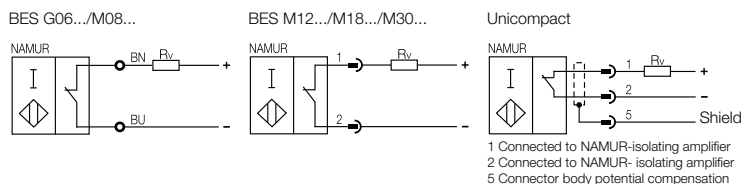


Sensors in accordance with marking

For use in Zone 1 or Zone 20.



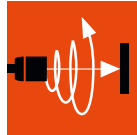
Wiring diagrams



Inductive Sensors with Special Properties

NAMUR, EX-protected

M12×1, M18×1, M30×1.5, 40×40 mm

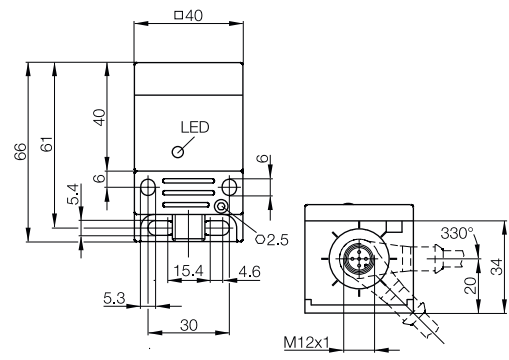
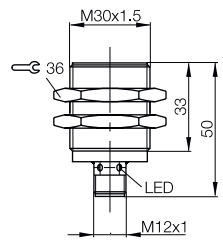
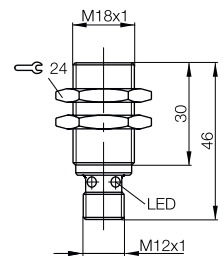
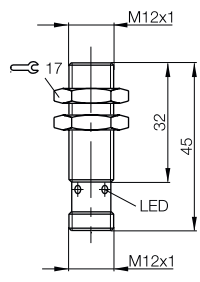


- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- High-pressure Resistant Sensors
- Ex Sensors
- Steelface Sensors
- High Temperature Rated Sensors
- Full PTFE Sensor
- Sensors for the Food Industry
- Factor 1 Sensors
- Weld and Magnetic Field Immune Sensors
- Diagnostics Sensors
- Large Designs
- Ring Sensors
- Hose Sensors
- Analog Distance Measurement
- Accessories

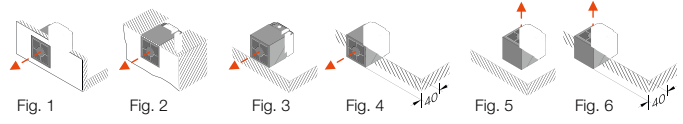


M12×1 mm	M18×1 mm	M30×1.5 mm	40×40×66 mm Unicomact	40×40×66 mm Unicomact
Flush	Flush	Flush	Flush	Not flush
4 mm	8 mm	15 mm	20 mm	35 mm
0...3.2 mm	0...6.5 mm	0...12.2 mm	0...16.2 mm	0...28.4 mm
BES02ZU	BES02ZW	BES02ZY	BES02ZZ	BES0300
BES M12ME-GNX40B-S04G-EEEX	BES M18ME1-GNX80B-S04G-EEEX	BES M30ME1-GNX15B-S04G-EEEX	BES Q40KFU-GNX20B-S92G-EEEX	BES Q40KFU-GNX35F-S92G-EEEX
8.2 V DC	8.2 V DC	8.2 V DC	8.2 V DC	8.2 V DC
7.7...9 V DC	7.7...9 V DC	7.7...9 V DC	7.7...9 V DC	7.7...9 V DC
75 V DC	75 V DC	75 V DC	75 V DC	75 V DC
Current change (no trigger response)	Current change (no trigger response)	Current change (no trigger response)	Current change (no trigger response)	Current change (no trigger response)
≤ 1 mA	≤ 1 mA	≤ 1 mA	≤ 1 mA	≤ 1 mA
≥ 2.1 mA	≥ 2.1 mA	≥ 2.1 mA	≥ 2.1 mA	≥ 2.1 mA
1 kΩ	1 kΩ	1 kΩ	1 kΩ	1 kΩ
no*	no*	no*	no*	no*
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
700 Hz	400 Hz	100 Hz	200 Hz	100 Hz
LED	No	No	No	No
IP 67	IP 67	IP 67	IP 67	IP 67
Brass-coated	Brass-coated	Brass-coated	PPE/PPS	PPE/PPS
PBT	PBT	PBT	PBT	PBT
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 5-pin	M12 connector, 5-pin

EN 50014:1997+A1+A2	EN 50014:1997+A1+A2	EN 50014:1997+A1+A2	EN 50014:1997+A1+A2	EN 50014:1997+A1+A2
EN 50020	EN 50020	EN 50020	EN 50020	EN 50020
BVS 05 ATEX E 162 X	BVS 05 ATEX E 162 X	BVS 05 ATEX E 162 X	BVS 05 ATEX E 162 X	BVS 05 ATEX E 162 X
Ex II 2G EEx ia IIC T6	Ex II 2G EEx ia IIC T6	Ex II 2G EEx ia IIC T6	Ex II 2G EEx ia IIC T6	Ex II 2G EEx ia IIC T6
Ex II 1D Ex iaD 20 T90°C	Ex II 1D Ex iaD 20 T90°C	Ex II 1D Ex iaD 20 T90°C	Ex II 1D Ex iaD 20 T90°C	Ex II 1D Ex iaD 20 T90°C
210 nF	200 nF	230 nF	250 nF	220 nF
0.115 mH	0.19 mH	0.21 mH	0.45 mH	0.71 mH
U = 15 V	U = 15 V	U = 15 V	U = 15 V	U = 15 V
I = 50 mA	I = 50 mA	I = 50 mA	I = 50 mA	I = 50 mA
P = 120 mW	P = 120 mW	P = 120 mW	P = 120 mW	P = 120 mW



Permissible installation variations for Unicomact



Inductive Steelface sensors with selective response ignore ferrous or non-ferrous metals, depending on the version.

The property of being able to ignore ferrous or non-ferrous metals and the particular robustness of the Steelface sensors open up new possibilities in automation technology. Because the sensors are right where the action is.

Steelface sensors are used in especially harsh environments and applications too extreme for standard sensors. Here is where they show their strengths:

- they increase the availability of your systems,
- reduce your maintenance and storage costs,
- are resistant to abrasive media and aggressive cleaning agents and
- provide a robust sensing surface.

Correction factors

Model	Steel FE 360	Stainless steel	Aluminum	Copper	Brass
DC					
M8 Ferrous	1	0.1... 0.7	0	0	0.1
M12 ferrous	1	0.1... 0.7	0	0	0
M12 non ferrous	0	0	1	1.1	0.9
M18 ferrous	1	0.1... 0.7	0	0	0
M18 non ferrous	0	0	1	1.1	0.9
M30 ferrous	1	0.1... 0.7	0	0	0
M30 non ferrous	0	0	1	1.1	0.9

Effective switching distance = Rated switching distance × correction factor

Ferrous: Detection of ferromagnetic steel and iron.

Non-Ferrous: Detection of non-magnetizing metals such as aluminum, copper, brass and many stainless steels.



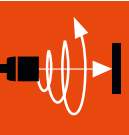
Inductive Sensors with Special Properties

Steelface sensors

M8x1



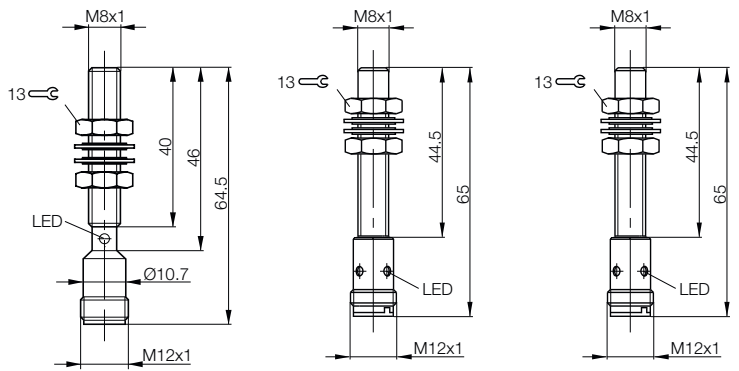
Size	M8x1	M8x1	M8x1
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush	Flush
Rated switching distance s_n	1.5 mm	2 mm	2 mm
Assured switching distance s_a	0...1.2 mm	0...1.6 mm	0...1.6 mm
Switching distance marking	■	■■	■■■
PNP, NO	Ordering code Part number	BES02YZ BES M08EG1-PSC15S-S04G-S	BES02N5 BES M08EH1-PSC20B-S04G-S
NPN, NO	Ordering code Part number	BES02YY BES M08EG1-NSC15S-S04G-S	BES02N3 BES M08EH1-NSC20B-S04G-S
Supply voltage U_s	10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.	2 V	2.5 V	2.5 V
Rated insulation voltage U_i	75 V DC	75 V DC	75 V DC
Rated operating current I_e	100 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected	Yes/No/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a	-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.	20 Hz	750 Hz	750 Hz
Function indicator	Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67
Approvals	CE	CE	CE
Special properties	Selective ferrous	Pressure rated to 80 bar	Pressure rated to 80 bar, weld spatter-resistant
Material	Housing	Stainless steel	Stainless steel, PTFE coated
	Sensing surface	Stainless steel	Stainless steel, PTFE coated
Connection	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin



- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- High-pressure Resistant Sensors
- Ex Sensors
- Steelface Sensors**
- High-temperature Rated Sensors
- Full PTFE Sensor
- Sensors for the Food Industry
- Factor 1 Sensors
- Weld and Magnetic Field Immune Sensors
- Diagnostics Sensors
- Large Designs
- Ring Sensors
- Hose Sensors
- Analogue Distance Measurement
- Accessories

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

When using metal mounts, a reduction in the switching distance is to be expected. You should check whether the clamping holder can be used in the application.

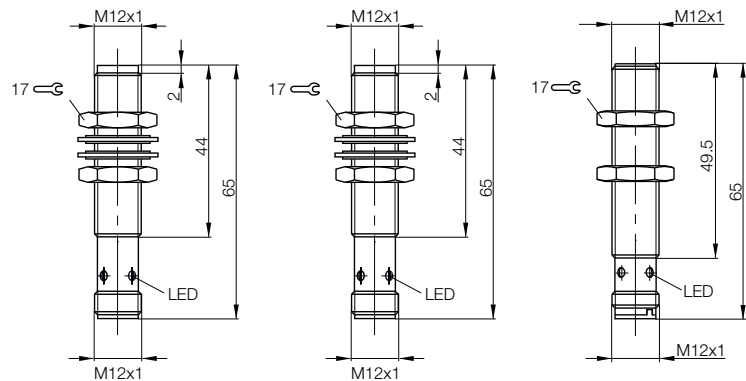




Size		M12x1	M12x1	M12x1
Installation type (pay attention to the note in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		2 mm	2 mm	4 mm
Assured switching distance s_a		0...1.6 mm	0...1.6 mm	0...3.2 mm
Switching distance marking		■	■	■■
PNP, NO	Ordering code	BES02Z2	BES02Z3	BES02NA
	Part number	BES M12EG1-PSC20N-S04G-S	BES M12EG1-PSC20S-S04G-S	BES M12EI-PSC40B-S04G-S
PNP, NC	Ordering code		BES02Z1	
	Part number		BES M12EG1-POC20S-S04G-S	
NPN, NO	Ordering code		BES02Z0	BES02N8
	Part number		BES M12EG1-NSC20S-S04G-S	BES M12EI-NSC40B-S04G-S
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		2 V	2 V	2.5 V
Rated insulation voltage U_i		75 V DC	75 V DC	75 V DC
Rated operating current I_e		200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/No/Yes	Yes/No/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		50 Hz	50 Hz	500 Hz
Function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Approvals		CE	CE	CE
Special properties		Selective non-ferrous	Selective ferrous	Pressure rated to 60 bar
Material	Housing	Stainless steel	Stainless steel	Stainless steel
	Sensing surface	Stainless steel	Stainless steel	Stainless steel
Connection		M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

When using metal mounts, a reduction in the switching distance is to be expected. You should check whether the clamping holder can be used in the application.



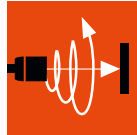
Inductive Sensors with Special Properties

Steelface sensors

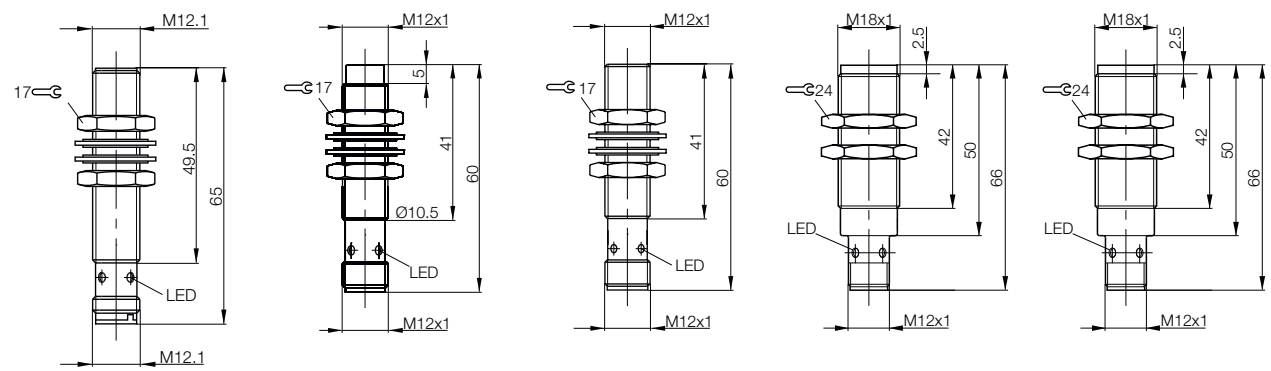
M12x1, M18x1



M12x1	M12x1	M12x1	M18x1	M18x1
Flush	Not flush	Quasi-flush	Flush	Flush
4 mm	10 mm	6 mm	5 mm	5 mm
0...3.2 mm	0...8.1 mm	0...4.9 mm	0...4.1 mm	0...4.1 mm
■	■■■	■■■	■	■
BES02NC	BES02WE	BES02WH	BES02Z8	BES02Z9
BES M12EI-PSC40B-S04G-S01	BES M12EF1-PSC10F-S04G-S	BES M12EG1-PSC60Z-S04G-S11	BES M18EG1-PSC50N-S04G-S	BES M18EG1-PSC50S-S04G-S
				BES02Z7
				BES M18EG1-POC50S-S04G-S
BES02N9	BES02WC	BES02WF		BES02Z6
BES M12EI-NSC40B-S04G-S01	BES M12EF1-NSC10F-S04G-S	BES M12EG1-NSC60Z-S04G-S11		BES M18EG1-NSC50S-S04G-S
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2.5 V	2 V	2 V	2 V	2 V
75 V DC	75 V DC	75 V DC	75 V DC	75 V DC
200 mA	200 mA	200 mA	100 mA	100 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/No/Yes	Yes/No/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
500 Hz	350 Hz	400 Hz	15 Hz	15 Hz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67	IP 67
CE	CE	CE	CE	CE
Pressure rated to 60 bar, weld spatter-resistant	Pressure rated to 80 bar	Pressure rated to 80 bar	Selective non-ferrous	Selective ferrous
Stainless steel, PTFE coated	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Stainless steel, PTFE coated	Stainless steel	Stainless steel	Stainless steel	Stainless steel
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin



- Inductive Sensors
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- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
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- High-pressure Resistant Sensors
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- Steelface Sensors
- High Temperature Rated Sensors
- Full PTFE Sensor
- Sensors for the Food Industry
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- Weld and Magnetic Field Immune Sensors
- Diagnostics Sensors
- Large Designs
- Ring Sensors
- Hose Sensors
- Analog Distance Measurement
- Accessories



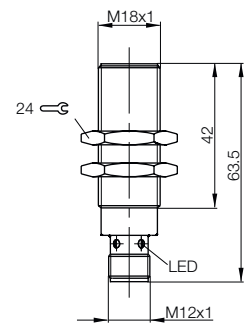
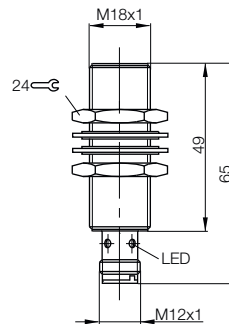
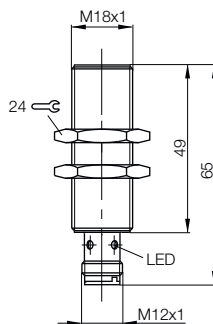


Size		M18x1	M18x1	M18x1
Installation type (pay attention to the note in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		7.2 mm	7.2 mm	10 mm
Assured switching distance s_a		0...5.2 mm	0...5.2 mm	0...8.1 mm
Switching distance marking		■ ■	■ ■	■ ■
PNP, NO	Ordering code	BES02NJ	BES02NK	BES02Y3
	Part number	BES M18EI-PSC72B-S04G-S	BES M18EI-PSC72B-S04G-S01	BES M18EG1-PSC10Z-S04G-S11
NPN, NO	Ordering code	BES02NF	BES02NH	BES02Y2
	Part number	BES M18EI-NSC72B-S04G-S	BES M18EI-NSC72B-S04G-S01	BES M18EG1-NSC10Z-S04G-S11
Supply voltage U_S		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		2.5 V	2.5 V	2 V
Rated insulation voltage U_i		75 V DC	75 V DC	75 V DC
Rated operating current I_e		200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		250 Hz	250 Hz	200 Hz
Function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Approvals		CE	CE	CE
Special properties		Pressure rated to 40 bar	Pressure rated to 40 bar, weld spatter-resistant	Pressure rated to 60 bar
Material	Housing	Stainless steel	Stainless steel, PTFE coated	Stainless steel
	Sensing surface	Stainless steel	Stainless steel, PTFE coated	Stainless steel
Connection		M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

Wiring diagrams, see page 958.

The meaning of switching distance markings can be found on page 962.

When using metal mounts, a reduction in the switching distance is to be expected. You should check whether the clamping holder can be used in the application.



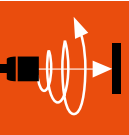
Inductive Sensors with Special Properties

Steelface sensors

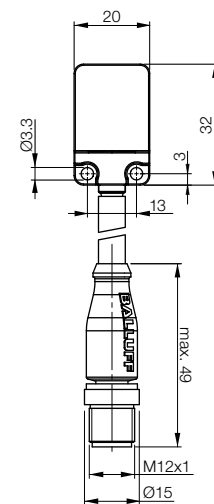
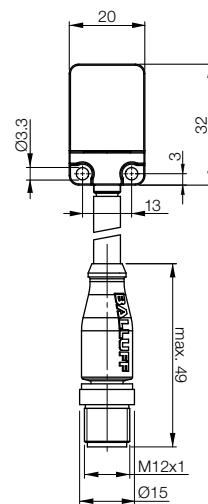
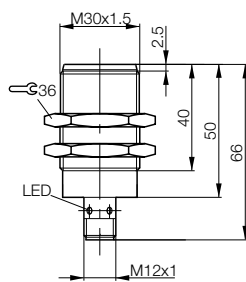
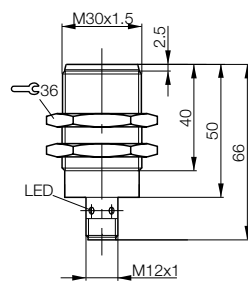
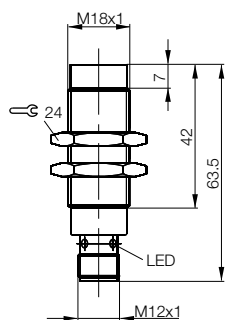
M18x1, M30x1.5, 20x32x8 mm



M18x1	M30x1.5	M30x1.5	20x32x8 mm	20x32x8 mm
Not flush	Flush	Flush	Flush	Flush
20 mm	8 mm	8 mm	5 mm	5 mm
0...16.2 mm	0...6.5 mm	0...6.5 mm	0..4 mm	0...4 mm
■ ■	■	■	■	■
BES02Y1	BES02ZH	BES02ZJ	BES04AH	BES049Y
BES M18EF1-PSC20F-S04G-S	BES M30EG1-PSC80N-S04G-S	BES M30EG1-PSC80S-S04G-S	BES R01EC-PSC50A-BP00,3-GS04-W50	BES R01EC-PSC50A-BP00,3-GS04-W51
		BES02ZF		
		BES M30EG1-NSC80S-S04G-S		
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2 V	2 V	2 V	1.5 V	1.5 V
75 V DC	75 V DC	75 V DC	75 V DC	75 V DC
200 mA	100 mA	100 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/No/Yes	Yes/No/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	0...+50 °C	0...+50 °C
200 Hz	15 Hz	15 Hz	20 Hz	20 Hz
Yellow LED	Yellow LED	Yellow LED	Yellow LED/green LED in the connector	Yellow LED/green LED in the connector
IP 67	IP 67	IP 67	IP 60	IP 60
CE	CE	CE	CE, cULus	CE, cULus
Pressure rated to 60 bar	Selective non-ferrous	Selective ferrous	Factor 1	Factor 1
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	0.3 m PUR cable with silicone sheath and M12 connector, 3-pin with LED	0.3 m PUR cable with silicone sheath and M12 connector, 3-pin with LED



- Inductive Sensors
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- Hose Sensors
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- Accessories



Inductive Sensors
with Special Properties
Temperature resistant sensors
M5x0.5, M8x1, M12x1



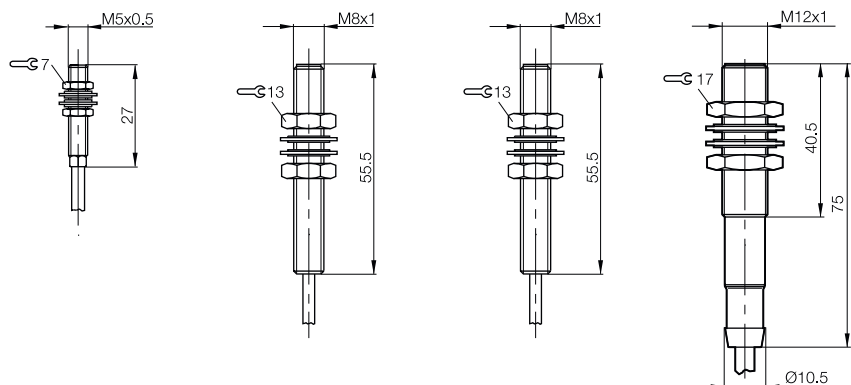
**Temperature
Resistant Sensors**



Size		M5x0.5	M8x1	M8x1	M12x1
Mounting type		Flush	Flush	Flush	Flush
Rated switching distance s_n		0.5 mm	1 mm	2 mm	2 mm
Assured switching distance s_a		0...0.4 mm	0...0.8 mm	0...1.6 mm	0...1.6 mm
Switching distance marking		■	■	■ ■	■
PNP, NO	Ordering code	BES02J2	BES02HP	BES02HK	BES02HU
	Part number	BES M05ED-PSD05B-ES02-T01	BES 516-324-SA8-02	BES 516-324-SA26-02	BES 516-325-SA19-03
PNP, complementary	Ordering code				
	Part number				
NPN, NO	Ordering code				BES0361
	Part number				BES 516-329-SA14-A0-X-03
NPN, complementary	Ordering code				
	Part number				
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		1 V	1.5 V	1.5 V	PNP 1.8 V, NPN 1.5 V
Rated insulation voltage U_i		75 V DC	75 V DC	75 V DC	75 V DC
Rated operating current I_e		≤ 150 mA (image 1)	≤ 200 mA (image 2)	≤ 200 mA (image 3)	≤ 200 mA (image 3)
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/No/No	Yes/No/No	Yes/No/No
Ambient temperature T_a		-25...+120 °C	-25...+100 °C	-25...+120 °C	-25...+120 °C
Switching frequency f max.		1 kHz	2 kHz	1.5 kHz	1 kHz
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67, IP 60 cable outlet	IP 68 according to BWN Pr. 20, IP 60 cable outlet
Approvals		CE	CE	CE	CE
Material	Housing	Stainless steel	Stainless steel	Stainless steel	Brass-coated
	Sensing surface	PA 6	PBT	PBT	PEEK
Connection		2 m silicon cable, 3x0.15 mm ²	2 m PVC cable, 3x0.14 mm ²	2 m Teflon cable, 3x0.14 mm ²	3 m silicon cable, 3x0.5 mm ²
Pressure rated to					3 bar

Wiring diagrams, see page 958.
Switching distance markings can be found
on page 962.

Other cable lengths on request.

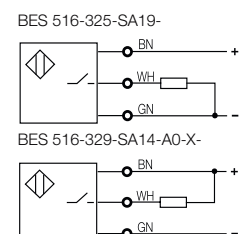


Temperature rated sensors to +120 °C

More and more industrial processes are running at higher temperatures. This increases the demands on the sensors. With the high temperature rated sensors from Balluff, you are on the safe side even at high temperatures.

Applications

- Steel production
- Motor function monitoring
- Glass manufacturing



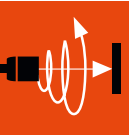
Inductive Sensors with Special Properties

Temperature resistant sensors

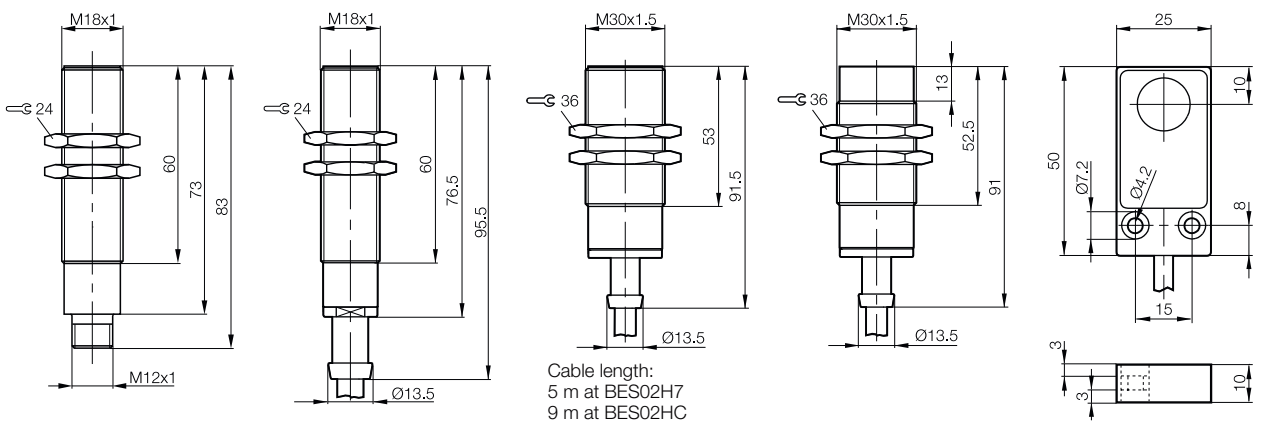
M18x1, M30x1.5, 25x50x10 mm



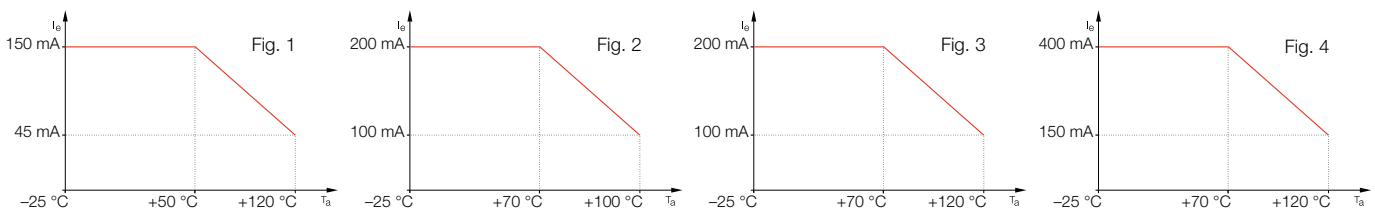
M18x1	M18x1	M30x1.5	M30x1.5	25x50x10 mm
Flush	Flush	Flush	Not flush	Flush
5 mm	5 mm	10 mm	15 mm	5 mm
0...4.1 mm	0...4.1 mm	0...8.1 mm	0...12.2 mm	0...4.1 mm
■	■	■	■	■
				BES02J0
				BES 516-347-SA2-03
BES02H6	BES02H5	BES02H7	BES02HE	
BES 516-105-SA5	BES 516-105-SA2-05	BES 516-114-SA1-05	BES 516-125-SA1-05	
		BES02HC		
		BES 516-120-SA2		
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	24 V DC ±10%
1.5 V	1.5 V	1.5 V	1.5 V	2.5 V
75 V DC	75 V DC	75 V DC	75 V DC	75 V DC
≤ 400 mA (image 4)	≤ 400 mA (image 4)	≤ 400 mA (image 4)	≤ 400 mA (image 4)	≤ 25 mA
Yes/No/No	Yes/No/No	Yes/No/No	Yes/No/No	Yes/Yes/Yes
-25...+120 °C	-25...+120 °C	-25...+120 °C	-25...+120 °C	-25...+100 °C
500 Hz	500 Hz	300 Hz	100 Hz	500 Hz
IP 67	IP 67, IP 60 cable outlet	IP 67, IP 60 cable outlet	IP 67, IP 60 cable outlet	IP 67, IP 60 cable outlet
CE	CE	CE	CE	CE
Brass-coated	Brass-coated	Brass-coated	Brass-coated	Cast aluminum
PBT	PBT	PBT	PA 12	PBT
M12 connector, 4-pin	5 m silicon cable, 4x0.75 mm ²	5 m silicon cable, 4x0.75 mm ² ,	5 m silicon cable, 4x0.75 mm ²	3 m silicon cable, 4x0.75 mm ²



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- Full PTFE Sensor
- Sensors for the Food Industry
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- Weld and Magnetic Field Immune Sensors
- Diagnostics Sensors
- Large Designs
- Ring Sensors
- Hose Sensors
- Analog Distance Measurement
- Accessories



Current reduction as a function of ambient temperature range



Temperature Resistant Sensors



160 °C
High temperature range



160 °C
High temperature range

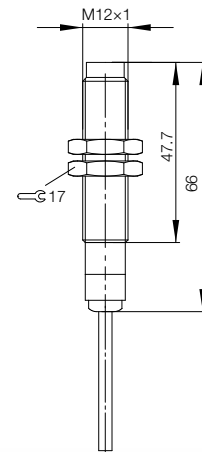
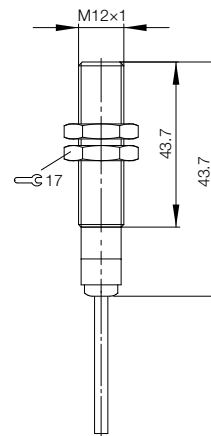
Size	M12x1		M12x1
Mounting type	Flush		Not flush
Rated switching distance s_n	2 mm		2 mm
Assured switching distance s_a	0...1.6 mm		0...1.6 mm
Switching distance marking	■		■
PNP, NO	Ordering code	BES04CK	BES04CL
	Part number	BES 515-325-SA74-D-TF-02	BES 515-356-SA35-D-TF-02
Supply voltage U_s	10...30 V DC		10...30 V DC
Voltage drop U_d at I_e max.	2.5 V		2.5 V
Rated insulation voltage U_i	75 V DC		75 V DC
Rated operating current I_e	200 mA		200 mA
Polarity reversal protected/transposition protected/short-circuit protected	Yes/No/No		Yes/No/No
Ambient temperature T_a	-25...+160 °C		-25...+160 °C
Switching frequency f max.	200 Hz		200 Hz
Degree of protection as per IEC 60529	IP 69K		IP 69K
Approvals	CE		CE
Material	Housing	Stainless steel	Stainless steel
	Sensing surface	PEEK	PEEK
Connection	2 m FEP cable, 3x0.34 mm ²		2 m FEP cable, 3x0.34 mm ²

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Variants with 5 m fixed cable are available on request.
This helps avoid having terminals in the hot zone.

The ultra-high temperature-resistant inductive sensors can be used in temperature ranges up to +160 °C. These sensors are ideally suited to harsh environments in the steel industry, in plastic injection molding machines and in forging and foundry processes.

- Optimization of system availability
- Reduction in maintenance costs
- Increase in process quality



Inductive Sensors with Special Properties

Temperature resistant sensors

M18x1, M30x1.5



160 °C
High temperature range



160 °C
High temperature range

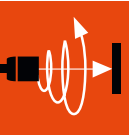


160 °C
High temperature range

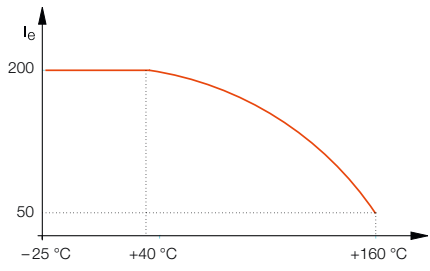
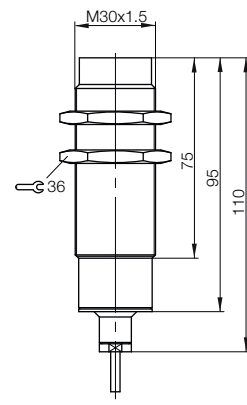
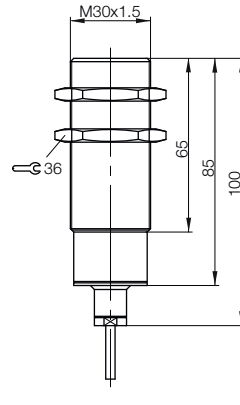
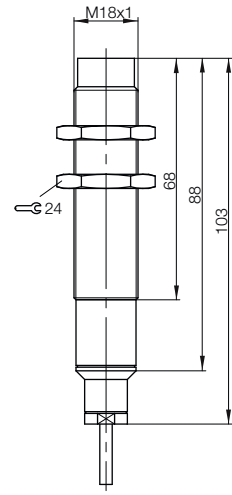
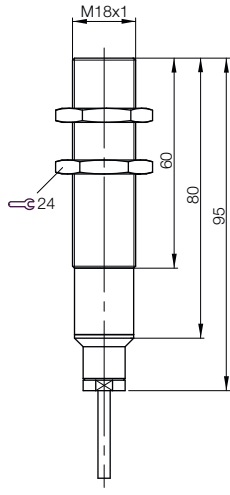


160 °C
High temperature range

M18x1	M18x1	M30x1.5	M30x1.5
Flush	Not flush	Flush	Not flush
5 mm	8 mm	10 mm	15 mm
0...4 mm	0...6.4 mm	0...8 mm	0...12 mm
■	■	■	■
BES043T	BES043U	BES043W	BES043Y
BES 515-326-SA49-D-TF-02	BES 515-360-SA13-D-TF-02	BES 515-327-SA22-D-TF-02	BES 515-362-SA4-D-TF-02
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2.5 V	2.5 V	2.5 V	2.5 V
75 V DC	75 V DC	75 V DC	75 V DC
200 mA	200 mA	200 mA	200 mA
Yes/No/No	Yes/No/No	Yes/No/No	Yes/No/No
-25...+160 °C	-25...+160 °C	-25...+160 °C	-25...+160 °C
200 Hz	200 Hz	200 Hz	200 Hz
IP 69K	IP 69K	IP 69K	IP 69K
CE	CE	CE	CE
Stainless steel	Stainless steel	Stainless steel	Stainless steel
PEEK	PEEK	PEEK	PEEK
2 m FEP cable, 3x0.34 mm ²	2 m FEP cable, 3x0.34 mm ²	2 m FEP cable, 3x0.34 mm ²	2 m FEP cable, 3x0.34 mm ²



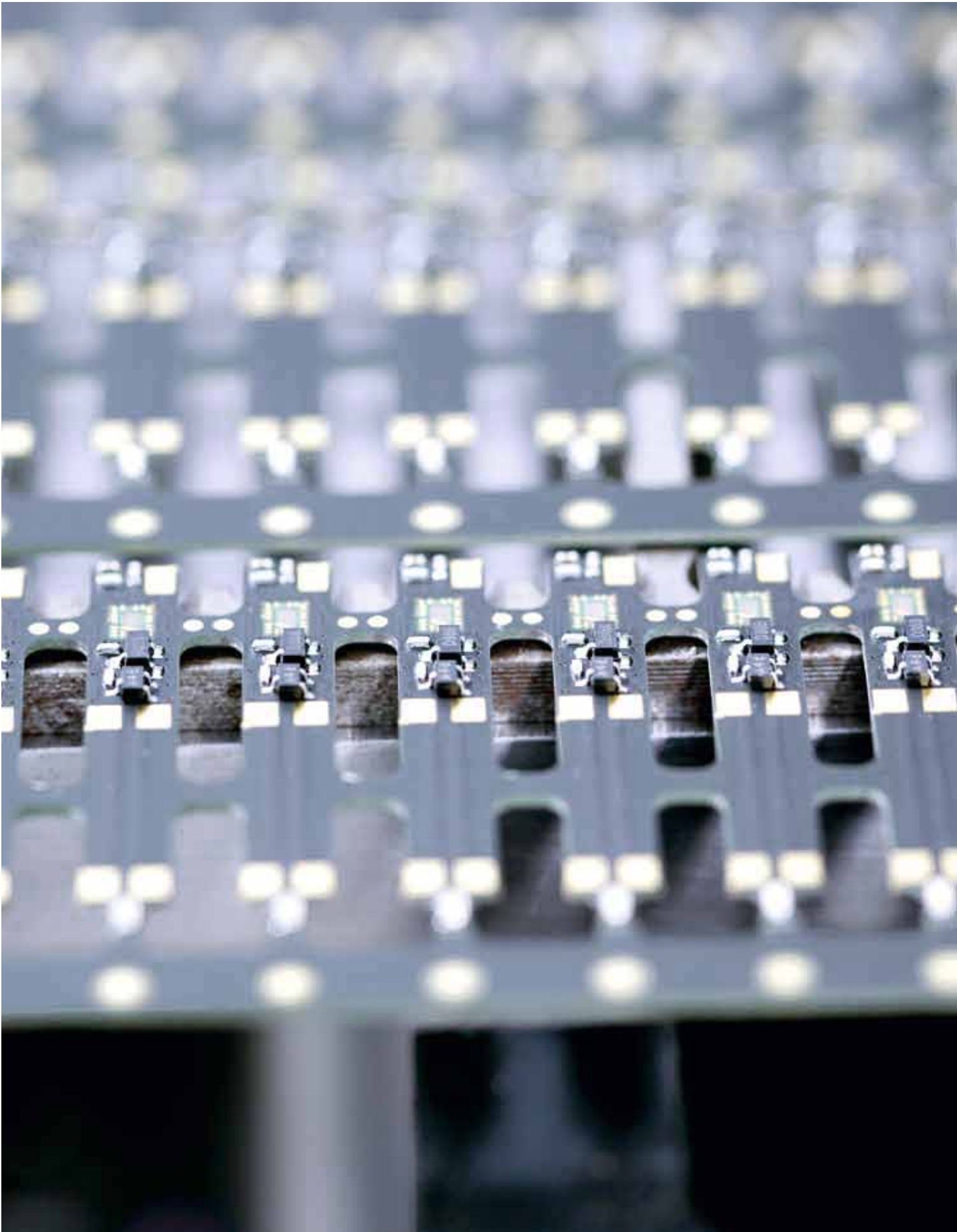
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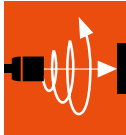


Inductive Sensors with Special Properties
Ideally suited for aggressive environments

DEXYI[®]

Full PTFE Sensor





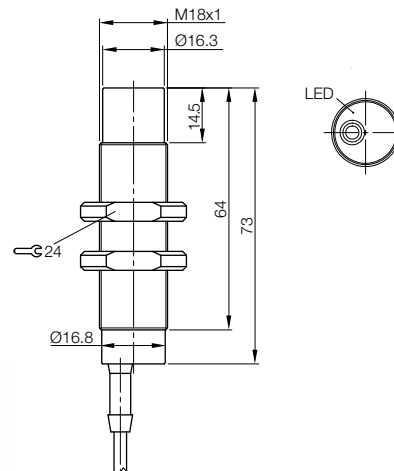
Inductive Sensors
Global DC 3-wire
DC 3-/4-wire
DC 2-wire
AC/DC 2-wire
AC 2-wire
Special Properties
High-pressure Resistant Sensors
Ex Sensors
Steelface Sensors
High Temperature Rated Sensors
Full PTFE Sensor
Sensors for the Food Industry
Factor 1 Sensors
Weld and Magnetic Field Immune Sensors
Diagnostics Sensors
Large Designs
Ring Sensors
Hose Sensors

Analog Distance Measurement
Accessories

Size	M18x1	
Mounting type	Not flush	
Rated switching distance s_n	16 mm	
Assured switching distance s_a	0...13 mm	
Switching distance marking	■■	
NPN, NO	Ordering code	BES049C
	Part number	BES M18TI2-NSC16F-AT05
Supply voltage U_S	10...30 V DC	
Voltage drop U_d at I_e	1.5 V	
Rated operating current I_e	200 mA	
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	
Ambient temperature T_a	-25...70 °C	
Switching frequency f max.	600 Hz	
Approvals	CE, cULus	
Degree of protection as per IEC 60529	IP 67	
Material	Housing	PTFE
	Sensing surface	PTFE
Connection	5 m PTFE cable, 3x0.14 mm ²	

Wiring diagrams, see page 958.

Additional switching outputs, cable lengths and form factors are available on request.



- Non-metal PTFE housing
- PTFE connection cable
- PTFE-encapsulated function indicator (red)
- Easily visible function indicator
- Large switching distance for reliable detection



The display for the switching state is encapsulated in the housing while still remaining easily visible.

Inductive sensors made from PTFE are ideal for extreme conditions. They can withstand almost any chemical corrosion. In addition, they can be used in a metal-free environment, particularly in the semiconductor industry.

Their application in a situation such as this could involve monitoring valve positions, thereby increasing system safety and availability. They also complete their tasks in wet areas and under clean room conditions. Any chance of metal contamination is prevented. Full PTFE sensors are being used to great effect in many applications in the chemical industry, for electroplating and even for acid filling.

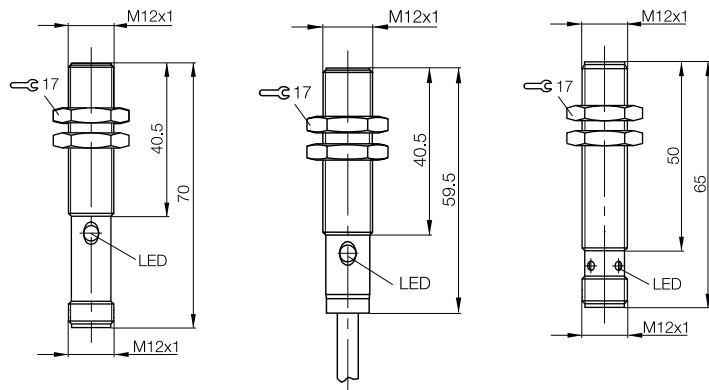


Increased temperature range

Size		M12x1	M12x1	M12x1	
Installation type (pay attention to the note in the Basic Information chapter)		Flush	Flush	Flush	
Rated switching distance s_n		2 mm	2 mm	4 mm	
Assured switching distance s_a		0...1.6 mm	0...1.6 mm	0...3.2 mm	
Switching distance marking		■	■	■■	
PNP, NO	Ordering code	BES02EL	BES02EH	BES02FU	
	Part number	BES 515-325-S4-C	BES 515-325-BO-C-PU-03	BES M12EI-PSC40B-S04G	
PNP, NC	Ordering code			BES02FT	
	Part number			BES M12EI-POC40B-S04G	
NPN, NO	Ordering code			BES02FR	
	Part number			BES M12EI-NSC40B-S04G	
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC	
Voltage drop U_d at I_e max.		1.5 V	1.5 V	1.5 V	
Rated insulation voltage U_i (protection class)		250 V AC (□)	250 V AC (□)	250 V AC (□)	
Rated operating current I_e		200 mA	200 mA	200 mA	
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+85 °C	
Switching frequency f max.		≤ 3 kHz	≤ 3 kHz	≤ 1 kHz	
Function indicator		Yellow LED	Yellow LED	Yellow LED	
Degree of protection as per IEC 60529		IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	
Approvals		CE, cULus	CE, cULus	CE, cULus	
Material	Housing	Stainless steel	Stainless steel	Stainless steel	
	Sensing surface	PA 12	PA 12	LCP	
Connection		M12 connector, 4-pin	3 m PUR cable, 3x0.34 mm ²	M12 connector, 4-pin	

Wiring diagrams, see page 958.
 The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request



Built tough – stainless steel housing stops aggressive media in its tracks. Inductive sensors are increasingly being used also in aggressive environments such as machine tools, the chemical industry, the packaging machinery industry and the food industry. Aggressive cleaning agents, in connection with high-pressure cleaning devices, do not affect our PROXINOX[®] sensors.

Inductive Sensors with Special Properties

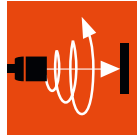
Sensors for the food industry

M12x1 standard

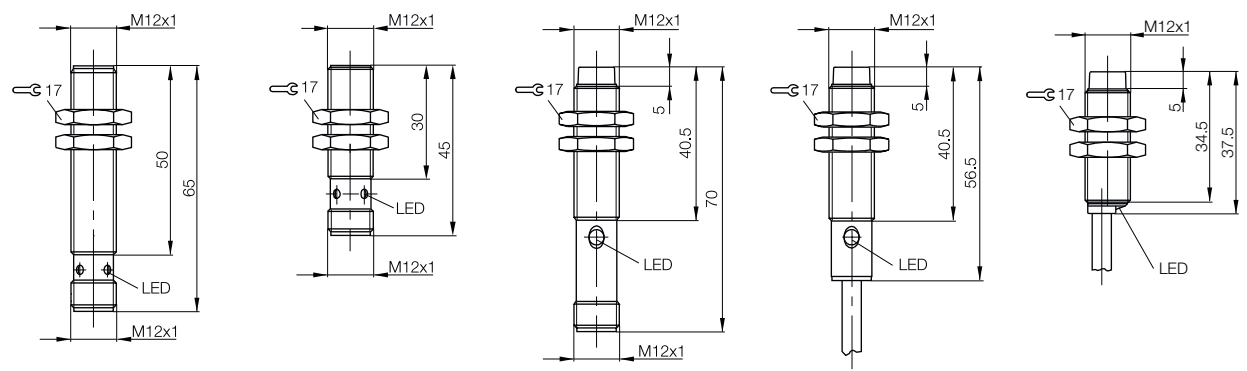


Increased temperature range

M12x1	M12x1	M12x1	M12x1	M12x1	M12x1
Flush	Flush	Not flush	Not flush	Not flush	Not flush
4 mm	4 mm	4 mm	4 mm	4 mm	4 mm
0...3.2 mm	0...3.2 mm	0...3.2 mm	0...3.2 mm	0...3.2 mm	0...3.2 mm
■ ■	■ ■	■	■	■	■
BES038C	BES014W	BES02FC	BES02F3	BES02F7	
BES M12EI-PSC40B-S04G-009	BES M12EE-PSC40B-S04G	BES 515-356-S4-C	BES 515-356-BO-C-03	BES 515-356-E4-C-03	
	BES014U				
	BES M12EE-POC40B-S04G				
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	
2.5 V	2 V	1.5 V	1.5 V	2 V	
250 V AC (□)	250 V AC (□)	250 V AC (□)	250 V AC (□)	250 V AC (□)	
200 mA	200 mA	200 mA	200 mA	200 mA	
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	
-40...+85 °C	-25...+85 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	
≤ 2 kHz	≤ 2 kHz	≤ 1.5 kHz	≤ 1.5 kHz	≤ 2 kHz	
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED	
IP 67	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus	
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel	
LCP	LCP	PA 12	PA 12	PBT	
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	3 m PVC cable, 3x0.34 mm ²	3 m PVC cable, 3x0.34 mm ²	



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- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
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- Steelface Sensors
- High-temperature Rated Sensors
- Full PTFE Sensor
- Sensors for the Food Industry
- Factor 1 Sensors
- Weld and Magnetic Field Immune Sensors
- Diagnostics Sensors
- Large Designs
- Ring Sensors
- Hose Sensors
- Analogue Distance Measurement
- Accessories

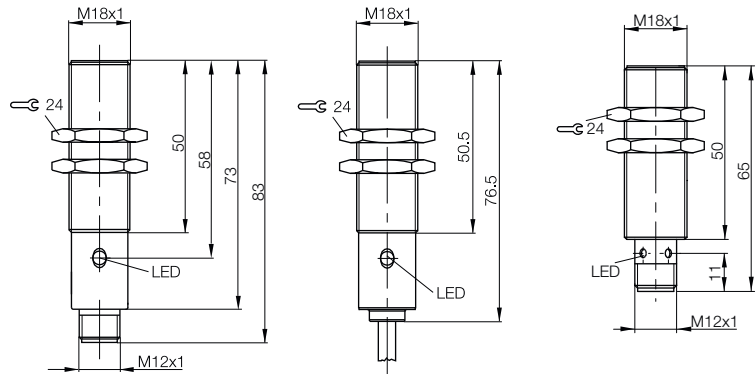




Size		M18x1	M18x1	M18x1
Installation type (pay attention to the note in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		5 mm	5 mm	8 mm
Assured switching distance s_a		0...4.1 mm	0...4.1 mm	0...6.5 mm
Switching distance marking		■	■	■■
PNP, NO	Ordering code	BES02EU	BES02EN	BES02H0
	Part number	BES 515-326-S4-C	BES 515-326-BO-C-PU-03	BES M18EI-PSC80B-S04G
PNP, NC	Ordering code			BES02FZ
	Part number			BES M18EI-POC80B-S04G
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		1.5 V	1.5 V	2.5 V
Rated insulation voltage U_i (protection class)		250 V AC (□)	250 V AC (□)	250 V AC (□)
Rated operating current I_e		200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-40...+85 °C	-25...+70 °C	-40...+85 °C
Switching frequency f max.		900 Hz	900 Hz	≤ 700 Hz
Function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
Approvals		CE, cULus	CE, cULus	CE, cULus
Material	Housing	Stainless steel	Stainless steel	Stainless steel
	Sensing surface	PA 12	PA 12	PBT
Connection		M12 connector, 4-pin	3 m PUR cable, 3x0.34 mm ²	M12 connector, 4-pin

Wiring diagrams, see page 958.
 The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request



Inductive Sensors with Special Properties

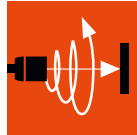
Sensors for the food industry

Standard M18x1, M30x1.5

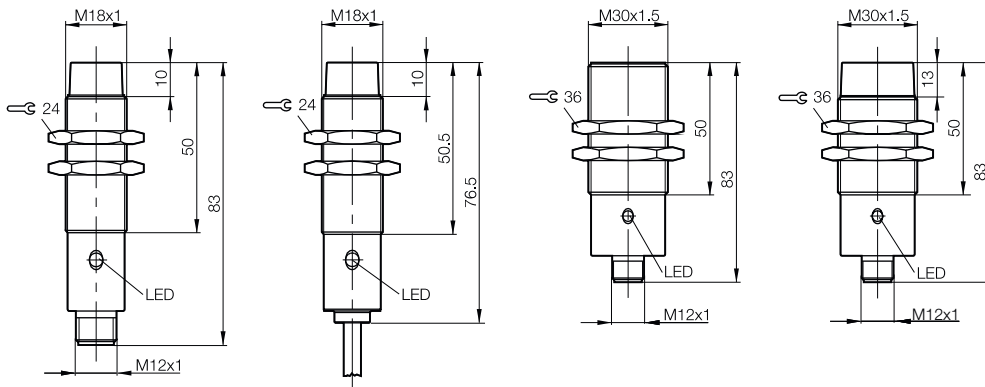


Increased temperature range

M18x1	M18x1	M30x1.5	M30x1.5	
Not flush	Not flush	Flush	Not flush	
8 mm	8 mm	10 mm	15 mm	
0...6.5 mm	0...6.5 mm	0...8.1 mm	0...12.2 mm	
■	■	■	■	
BES02FL	BES02FH	BES02F1	BES02FN	
BES 515-360-S4-C	BES 515-360-BO-C-PU-03	BES 515-327-S4-C	BES 515-362-S4-C	
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	
1.5 V	1.5 V	2.5 V	2.5 V	
250 V AC (□)	250 V AC (□)	250 V AC (□)	250 V AC (□)	
200 mA	200 mA	200 mA	200 mA	
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	
-40...+85 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	
≤ 600 Hz	≤ 600 Hz	≤ 300 Hz	≤ 100 Hz	
Yellow LED	Yellow LED	Yellow LED	Yellow LED	
IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	
CE, cULus	CE, cULus	CE, cULus	CE, cULus	
Stainless steel	Stainless steel	Stainless steel	Stainless steel	
PA 12	PA 12	PA 12	PA 12	
M12 connector, 4-pin	3 m PUR cable, 3x0.34 mm ²	M12 connector, 4-pin	M12 connector, 4-pin	



- Inductive Sensors
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- Steelface Sensors
- High Temperature Rated Sensors
- Full PTFE Sensor
- Sensors for the Food Industry**
- Factor 1 Sensors
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- Accessories



Inductive Sensors with Special Properties

Sensors for the food industry – increased requirements

PROXINOX® sensors – withstand the harshest cleaning processes

In the food- and beverage industry, the chemical industry, and even conveying operations, inductive sensors are routinely cleaned with more and more aggressive methods. Whether acids, bases, steam, foaming cleaners or high-pressure cleaners – PROXINOX®-stainless steel sensors fulfill stringent requirements.

Features

- No function display directly on sensor: the hole for the LED is a potential source of danger when cleaning, as well as a possible entry for bacteria. The function display is completely wrapped in the transparent plastic of the connector.
- Stainless steel housing (material 1.4571): This material is common in the food and beverage industry. The cable plug has to be adapted to different cleaning and- disinfection agents.
- Gold contacts: Harsh installation conditions require gold-plated contacts in order to avoid corrosion of connectors.
- Lasered or etched part number: Cleaning and disinfection processes can remove labels. Lasered or etched part numbers are there to stay.
- Additional O-ring seals for extreme requirements: Temperature shocks (caused by cleaning and disinfection) lead to strong and differing expansions of the steel housing and casting resin.

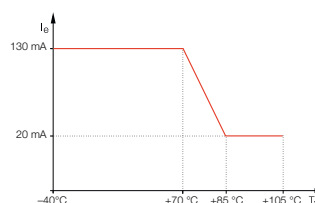


Size	
Installation type (pay attention to the note in the Basic Information chapter)	
Rated switching distance s_n	
Assured switching distance s_a	
Switching distance marking	
PNP, NO	Ordering code
	Part number
Supply voltage U_R	
Voltage drop U_d at I_o max.	
Rated insulation voltage U_i (protection class)	
Rated operating current I_o	
Polarity reversal protected/transposition protected/short-circuit protected	
Ambient temperature T_a	
Ambient temperature T_a at load current ≤ 20 mA	
Ambient temperature range T_a short-time 30 min	
Switching frequency f max.	
Degree of protection as per IEC 60529	
Approvals	
Material	Housing
	Sensing surface
Connection	

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request

Current reduction as a function of ambient temperature range



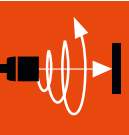
Steam jet tested



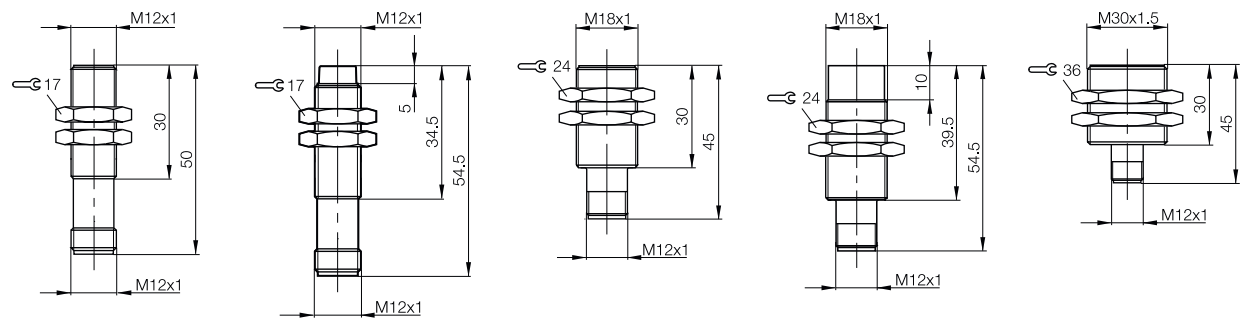
Inductive Sensors with Special Properties
Sensors for the food industry –
increased requirements M12x1, M18x1, M30x1.5



M12x1	M12x1	M18x1	M18x1	M30x1.5
Flush	Not flush	Flush	Not flush	Flush
2 mm	4 mm	5 mm	8 mm	10 mm
0...1.6 mm	0...3.2 mm	0...4.1 mm	0...6.5 mm	0...8.1 mm
■	■	■	■	■
BES02EK	BES02FA	BES02ET	BES02FK	BES02F0
BES 515-325-E5-T-S4	BES 515-356-E5-T-S4	BES 515-326-E5-T-S4	BES 515-360-E5-T-S4	BES 515-327-E5-T-S4
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
3.5 V	3.5 V	3.5 V	3.5 V	3.5 V
75 V DC	75 V DC	75 V DC	75 V DC	75 V DC
130 mA	130 mA	130 mA	130 mA	130 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-40...+70 °C	-40...+70 °C	-40...+70 °C	-40...+70 °C	-40...+70 °C
-40...+85 °C	-40...+85 °C	-40...+85 °C	-40...+85 °C	-40...+85 °C
+105 °C	+105 °C	+105 °C	+105 °C	+105 °C
≤ 800 Hz	≤ 400 Hz	≤ 500 Hz	≤ 200 Hz	≤ 200 Hz
IP 69K and IP 68 as per BWN Pr. 27	IP 69K and IP 68 as per BWN Pr. 27	IP 69K and IP 68 as per BWN Pr. 27	IP 69K and IP 68 as per BWN Pr. 27	IP 69K and IP 68 as per BWN Pr. 27
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Stainless steel 1.4571	Stainless steel 1.4571	Stainless steel 1.4571	Stainless steel 1.4571	Stainless steel 1.4571
PEEK	PEEK	PA 12	PA 12	PA 12
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin



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- AC 2-wire
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- Sensors for the Food Industry**
- Factor 1 Sensors
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- Diagnostics Sensors
- Large Designs
- Ring Sensors
- Hose Sensors
- Accessories
- Analogue Distance Measurement
- Accessories



Inductive Sensors with Special Properties

Sensors for the food industry – the highest requirements

Special requirements are placed on sensors in the food industry and in medical and pharmaceutical technology: FDA conformity and testing according to the Ecolab standard.

The sensors fulfill the highest requirements:

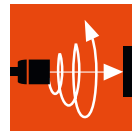
- Extended temperature range
- Safe to clean according to Ecolab
- FDA conformity
- Resistant to high-pressure cleaners

Steam jet tested



Inductive Sensors with Special Properties

Sensors for the food industry – the highest requirements Ø 12 mm, M12x1



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

AC 2-wire

Special Properties

High-pressure Resistant Sensors

Ex Sensors

Steelface Sensors

High Temperature Rated Sensors

Full PTFE Sensor

Sensors for the Food Industry

Factor 1 Sensors

Weld and Magnetic Field Immune Sensors

Diagnostics Sensors

Large Designs

Ring Sensors

Hose Sensors

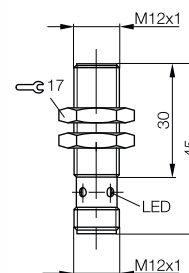
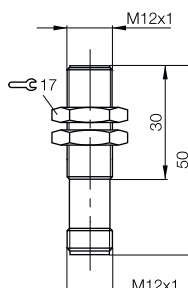
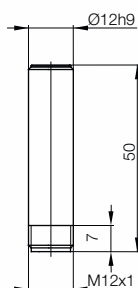
Analog Distance Measurement

Accessories

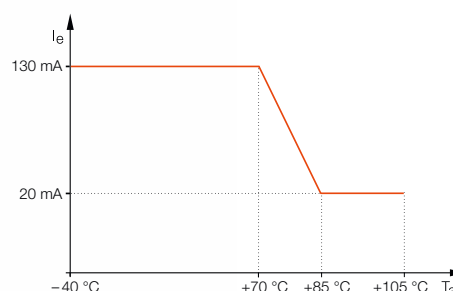
Size	Ø 12 mm	M12x1	M12x1
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush	Flush
Rated switching distance s_n	2 mm	2 mm	4 mm
Assured switching distance s_a	0...1.6 mm	0...1.6 mm	0...3.2 mm
Switching distance marking	■	■	■
PNP, NO	Ordering code Part number	BES0430 BES G12EE1-PSY20B-S04G-L02	BES0444 BES M12EE1-PSY20B-S04G-L01
PNP, NC	Ordering code Part number		BES0433 BES M12EE-PSC40B-S04G-L01
Supply voltage U_s	10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.	3.5 V	3.5 V	2 V
Rated insulation voltage U_i (protection class)	75 V DC	75 V DC	250 V AC (II)
Rated operating current I_e	130 mA*	130 mA*	200 mA
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a	-40...+105 °C	-40...+105 °C	-25...+85 °C
Switching frequency f max.	800 Hz	800 Hz	2000 Hz
Degree of protection as per IEC 60529	IP 69K and IP 68 as per BWN Pr. 27	IP 69K and IP 68 as per BWN Pr. 27	IP 69K and IP 68 as per BWN Pr. 20
Approvals	CE, cULus, Ecolab, FDA compliant	CE, cULus, Ecolab, FDA compliant	CE, cULus, Ecolab, FDA compliant
Material	Housing Sensing surface	Stainless steel 1.4571 PEEK	Stainless steel 1.4571 PEEK
Connection		M12 connector, 4-pin	M12 connector, 4-pin

Wiring diagrams, see page 958. The meaning of switching distance markings can be found on page 962.

Additional cable lengths and PUR cable jacket material available on request



*Current decrease curve



Inductive Sensors with Special Properties
Sensors for the food industry –
the highest requirements Ø 12 mm, M12x1



PROXINOX®

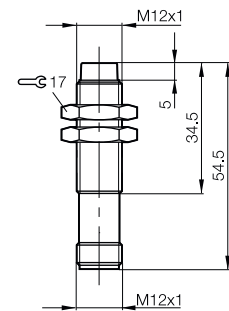
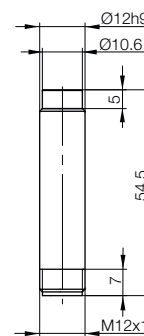
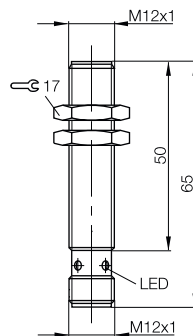
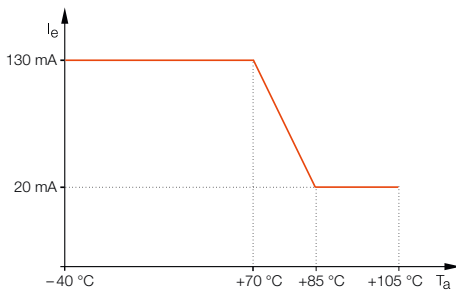


Size	M12x1	Ø 12 mm	M12x1
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Not flush	Not flush
Rated switching distance s_n	4 mm	4 mm	4 mm
Assured switching distance s_a	0...3.2 mm	0...3.2 mm	0...3.2 mm
Switching distance marking	■	■	■
PNP, NO	Ordering code Part number	BES0435 BES M12EI-PSC40B-S04G-L01	BES0431 BES G12EE1-PSY40F-S04G-L02
PNP, NC	Ordering code Part number	BES0434 BES M12EI-POC40B-S04G-L01	BES0443 BES G12EE1-PSY40F-S04G-L01
NPN, NO	Ordering code Part number	BES0436 BES M12EI-NSC40B-S04G-L01	
Supply voltage U_s	10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.	2.5 V	3.5 V	3.5 V
Rated insulation voltage U_i (protection class)	250 V AC (II)	75 V DC	75 V DC
Rated operating current I_e	200 mA	130 mA*	130 mA*
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a	-25...+85 °C	-40...+105 °C	-40...+105 °C
Switching frequency f max.	1000 Hz	400 Hz	400 Hz
Degree of protection as per IEC 60529	IP 69K and IP 68 as per BWN Pr. 20	IP 69K and IP 68 as per BWN Pr. 27	IP 69K and IP 68 as per BWN Pr. 27
Approvals	CE, cULus, Ecolab, FDA compliant	CE, cULus, Ecolab, FDA compliant	CE, cULus, Ecolab, FDA compliant
Material	Housing Sensing surface	Stainless steel 1.4404 LCP	Stainless steel 1.4571 PEEK
Connection		12 plug connector, 4-pin	M12 connector, 4-pin

Wiring diagrams, see page 958.
 The meaning of switching distance markings can be found on page 962.

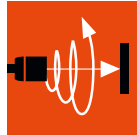
Additional cable lengths and PUR cable jacket material available on request

***Current decrease curve**



Inductive Sensors with Special Properties

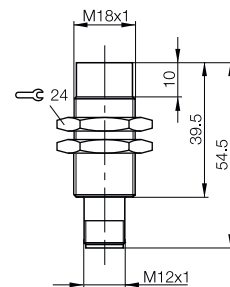
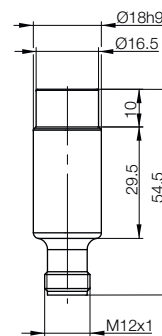
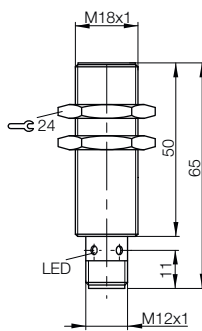
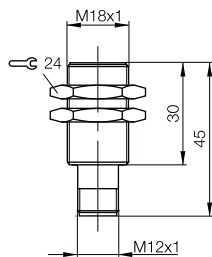
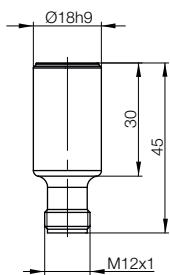
Sensors for the food industry – the highest requirements Ø 18 mm, M18x1



- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- High-pressure Resistant Sensors
- Ex Sensors
- Steelface Sensors
- High-temperature Rated Sensors
- Full PTFE Sensor
- Sensors for the Food Industry**
- Factor 1 Sensors
- Weld and Magnetic Field Immune Sensors
- Diagnostics Sensors
- Large Designs
- Ring Sensors
- Hose Sensors
- Analogue Distance Measurement
- Accessories



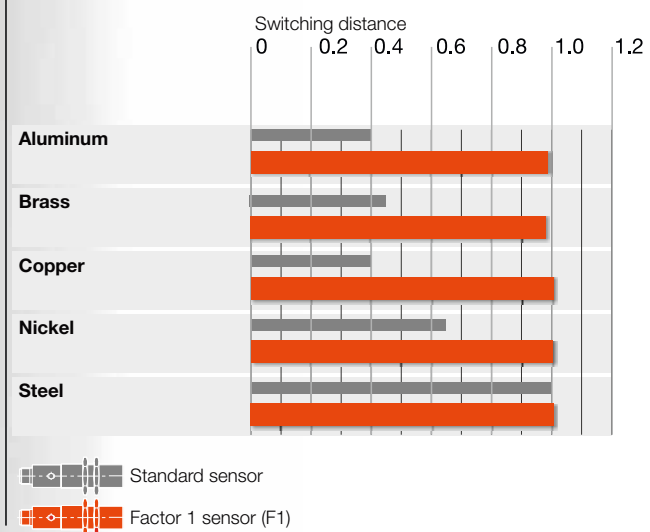
Ø 18 mm	M18x1	M18x1	Ø 18 mm	M18 mm
Flush	Flush	Flush	Not flush	Not flush
5 mm	5 mm	8 mm	8 mm	8 mm
0...4 mm	0...4 mm	0...6.4 mm	0...6.4 mm	0...6.4 mm
■	■	■	■	■
BES0439	BES0441	BES0437	BES043A	BES0442
BES G18EE1-PSY50B-S04G-L02	BES M18EE1-PSY50B-S04G-L01	BES M18EI-PSC80B-S04G-L01	BES G18EE1-PSY80F-S04G-L02	BES M18EE1-PSY80F-S04G-L01
		BES0438		
		BES M18EI-POC80B-S04G-L01		
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
3.5 V	3.5 V	2.5 V	3.5 V	3.5 V
75 V DC	75 V DC	250 V AC (⊠)	75 V DC	75 V DC
130 mA*	130 mA*	200 mA	130 mA*	130 mA*
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-40...+105 °C	-40...+105 °C	-40...+85 °C	-40...+105 °C	-40...+105 °C
500 Hz	500 Hz	700 Hz	200 Hz	200 Hz
IP 69K and IP 68 as per BWN Pr. 27	IP 69K and IP 68 as per BWN Pr. 27	IP 69K and IP 68 as per BWN Pr. 20	IP 69K and IP 68 as per BWN Pr. 27	IP 69K and IP 68 as per BWN Pr. 27
CE, cULus, Ecolab, FDA compliant	CE, cULus, Ecolab, FDA compliant	CE, cULus, Ecolab, FDA compliant	CE, cULus, Ecolab, FDA compliant	CE, cULus, Ecolab, FDA compliant
Stainless steel 1.4571	Stainless steel 1.4571	Stainless steel 1.4404	Stainless steel 1.4571	Stainless steel 1.4571
PEEK	PEEK	PEEK	PEEK	PEEK
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin



Factor 1 sensors identify objects, such as those made of steel, aluminum or brass, with identical switching distances (without reduction factor). These properties provide advantages in applications in which the material of the objects to be detected can vary, or non-ferrous metal can be detected with a high switching distance. Moreover, all Factor 1 sensors are magnetic field immune. Their function is not impaired by strong electromagnetic fields (such as from induction hardening- or welding equipment). Factor 1 sensors are not influenced in their switching behavior by welding currents up to 25 kA (at a distance from the current conductor of approx. 5 cm).



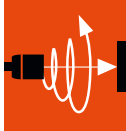
Comparison of sensor types/switching distances





Inductive Sensors with Special Properties

**Factor 1
M8x1**



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

AC 2-wire

Special Properties

High-pressure Resistant Sensors

Ex Sensors

Steelface Sensors

High-temperature Rated Sensors

Full PTFE Sensor

Sensors for the Food Industry

Factor 1 Sensors

Weld and Magnetic Field Immune Sensors

Diagnostics Sensors

Large Designs

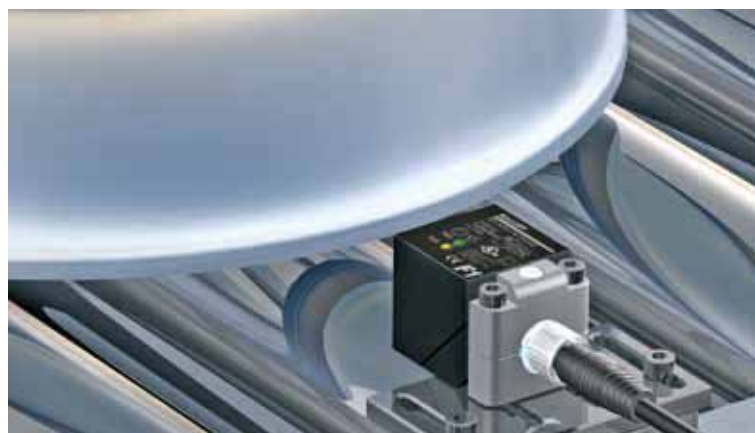
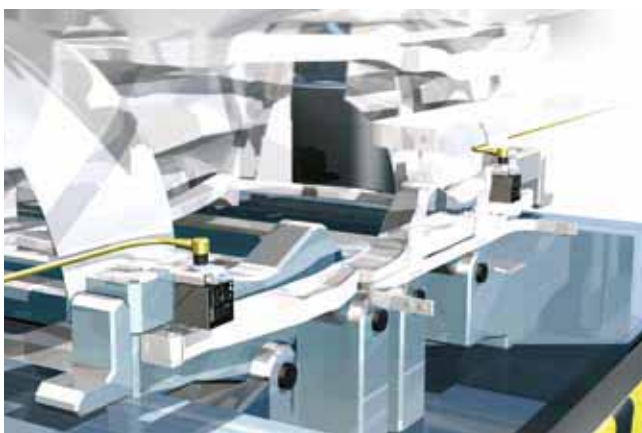
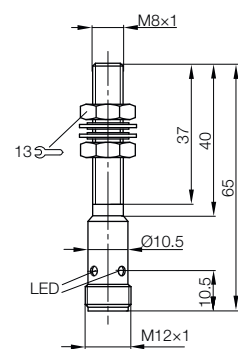
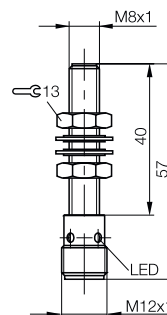
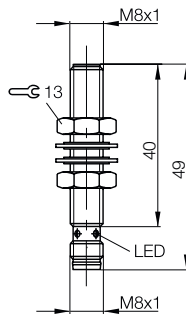
Ring Sensors
Hose Sensors

Analog Distance Measurement

Accessories

Size	M8x1	M8x1	M8x1
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush	Flush
Rated switching distance s_n	1.5 mm	1.5 mm	2 mm
Assured switching distance s_a	0...1.2 mm	0...1.2 mm	0...1.6 mm
Switching distance marking	■	■	■
PNP, NO	BES02YR	BES02YT	BES03YP
Ordering code	BES M08EG-PSC15A-S49G-W	BES M08EG1-PSC15A-S04G-W	BES M08MG1-PSC20A-S04G-W
Part number			
Supply voltage U_s	10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.	2.5 V	2.5 V	3 V
Rated insulation voltage U_i (protection class)	75 V DC	250 V AC (II)	75 V DC
Rated operating current I_e	150 mA	150 mA	100 mA
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a	-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.	2 kHz	2 kHz	1 kHz
Output function indicator	Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67
Approvals	CE	CE	CE
Special properties	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields
Material	Housing: Stainless steel, PTFE coated	Housing: Stainless steel, PTFE coated	Housing: Brass, PTFE coated
	Sensing surface: PBT, PTFE coated	Sensing surface: PBT, PTFE coated	Sensing surface: LCP, PTFE coated
Connection	M8 connector, 3-pin	M12 connector, 4-pin	M12 connector, 4-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.



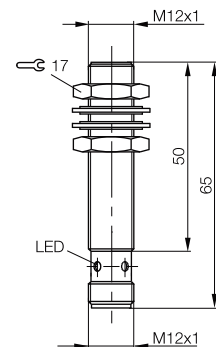
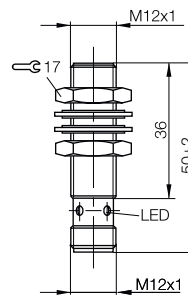
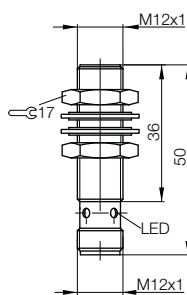
Inductive Sensors with Special Properties

Factor 1 M12x1



Size		M12x1	M12x1	M12x1
Installation type (pay attention to the note in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		3 mm	3 mm	3 mm
Assured switching distance s_a		0...2.4 mm	0...2.4 mm	0...2.4 mm
Switching distance marking		■ ■	■ ■	■ ■
PNP, NO	Ordering code	BES01PZ	BES02JZ	BES02K3
	Part number	BES M12MF-PSC30A-S04G	BES M12MF1-PSC30A-S04G-W	BES M12ML-PSC30A-S04G-W
NPN, NO	Ordering code			
	Part number			
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		2.5 V	2.5 V	2.5 V
Rated insulation voltage U_i (protection class)		250 V AC (□)	250 V AC (□)	250 V AC (□)
Rated operating current I_e		200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		2 kHz	2 kHz	2 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Approvals		CE	CE	CE
Special properties		Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields
Material	Housing	Brass, coated	Brass, PTFE coated	Brass, PTFE coated
	Sensing surface	LCP, PTFE coated	LCP, PTFE coated	LCP, PTFE coated
Connection		M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.



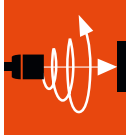


Inductive Sensors with Special Properties

Factor 1 M12x1



M12x1	M12x1	M12x1	M12x1	M12x1
Flush	Flush	Not flush	Not flush	Not flush
3 mm	4 mm	8 mm	8 mm	8 mm
0...2.2 mm	0...3.2 mm	0...6.5 mm	0...6.5 mm	0...6.5 mm
■ ■	■ ■	■ ■	■ ■	■ ■
BES02K4	BES03YR	BES01PW	BES02JW	BES02YU
BES M12ML-PSC30A-S04G-W01	BES M12MG-PSC40A-S04G-W	BES M12MD-PSC80E-S04G	BES M12MD1-PSC80E-S04G-W	BES M12MD1-NSC80E-S04G
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2.5 V	3 V	2.5 V	2.5 V	2.5 V
250 V AC (□)	60 V DC (□)	250 V AC (□)	250 V AC (□)	250 V AC (□)
200 mA	200 mA	200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
2 kHz	2 kHz	2 kHz	2 kHz	2 kHz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67	IP 67
CE	CE	CE	CE	CE
Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields
Brass, PTFE coated	Brass, PTFE coated	Brass, coated	Brass, PTFE coated	Brass, coated
Ceramic coating	PPS	LCP, PTFE coated	LCP, PTFE coated	PA 12
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

AC 2-wire

Special Properties

High-pressure Resistant Sensors

Ex Sensors

Steelface Sensors

High-temperature Rated Sensors

Full PTFE Sensor

Sensors for the Food Industry

Factor 1 Sensors

Weld and Magnetic Field Immune Sensors

Diagnostics Sensors

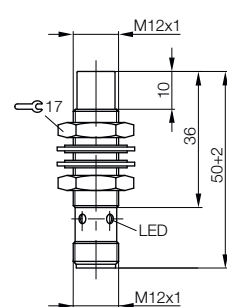
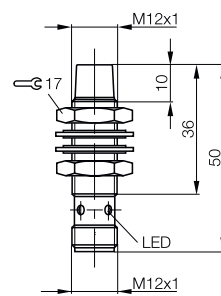
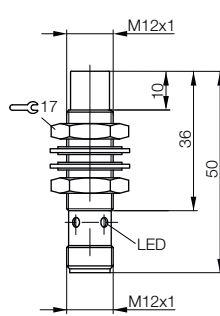
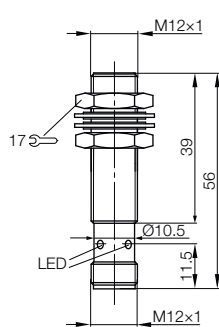
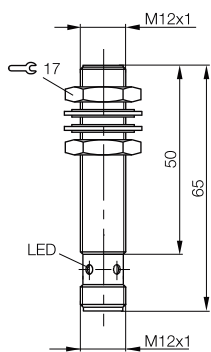
Large Designs

Ring Sensors

Hose Sensors

Analogue Distance Measurement

Accessories



Inductive Sensors with Special Properties

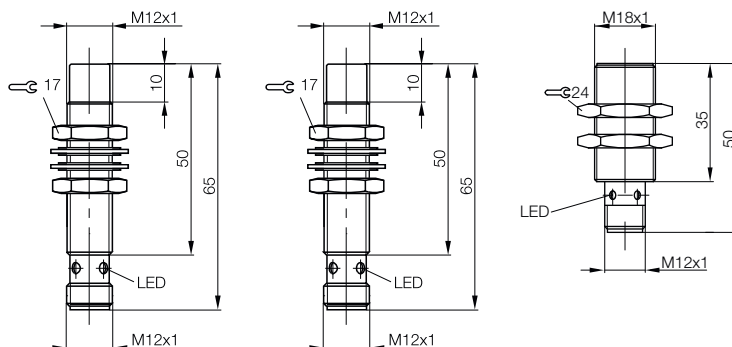
Factor 1

M12x1, M18x1



Size	M12x1	M12x1	M18x1	
Installation type (pay attention to the note in the Basic Information chapter)	Not flush	Not flush	Flush	
Rated switching distance s_n	8 mm	8 mm	5 mm	
Assured switching distance s_a	0...6.5 mm	0...6.3 mm	0...4 mm	
Switching distance marking	■ ■	■ ■	■	
PNP, NO	Ordering code	BES02K5	BES02K6	BES01R3
	Part number	BES M12ML-PSC80E-S04G-W	BES M12ML-PSC80E-S04G-W01	BES M18MF-PSC50A-S04G
Supply voltage U_s	10...30 V DC	10...30 V DC	10...30 V DC	
Voltage drop U_d at I_e max.	2.5 V	2.5 V	2.5 V	
Rated insulation voltage U_i (protection class)	250 V AC (II)	250 V AC (II)	250 V AC (II)	
Rated operating current I_e	200 mA	200 mA	200 mA	
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	
Ambient temperature T_a	-25...+70 °C	-25...+70 °C	-25...+70 °C	
Switching frequency f max.	2 kHz	2 kHz	2.5 kHz	
Output function indicator	Yellow LED	Yellow LED	Yellow LED	
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67	
Approvals	CE	CE	CE	
Special properties	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	
Material	Housing	Brass, PTFE coated	Brass, PTFE coated	Brass, coated
	Sensing surface	LCP, PTFE coated	Ceramic coating	LCP, PTFE coated
Connection	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.





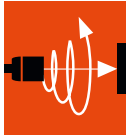
Inductive Sensors with Special Properties



Factor 1 M18x1



M18x1	M18x1	M18x1	M18x1	M18x1
Flush	Flush	Flush	Flush	Flush
5 mm	5 mm	5 mm	5 mm	8 mm
0...4 mm	0...4 mm	0...3.9 mm	0...4 mm	0...6.4 mm
■	■	■	■	■
BES02K9	BES02KJ	BES02KK	BES01R1	BES03YT
BES M18MF1-PSC50A-S04G-W	BES M18ML-PSC50A-S04G-W	BES M18ML-PSC50A-S04G-W01	BES M18EL-PSH50A-S04G	BES M18MG-PSC80A-S04G-W
10...30 V DC	10...30 V DC	10...30 V DC	10...55 V DC	10...30 V DC
2.5 V	2.5 V	2.5 V	2 V	3 V
250 V AC (□)	250 V AC (□)	250 V AC (□)	250 V AC (□)	60 V DC (□)
200 mA	200 mA	200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
2.5 kHz	2.5 kHz	2.5 kHz	600 Hz	350 Hz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67	IP 67
CE	CE	CE	CE	CE
Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields
Brass, PTFE coated	Brass, PTFE coated	Brass, PTFE coated	Stainless steel	Brass, PTFE coated
LCP, PTFE coated	LCP, PTFE coated	Ceramic coating	LCP	PPS
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

AC 2-wire

Special Properties

High-pressure Resistant Sensors

Ex Sensors

Steelface Sensors

High-temperature Rated Sensors

Full PTFE Sensor

Sensors for the Food Industry

Factor 1 Sensors

Weld and Magnetic Field Immune Sensors

Diagnostics Sensors

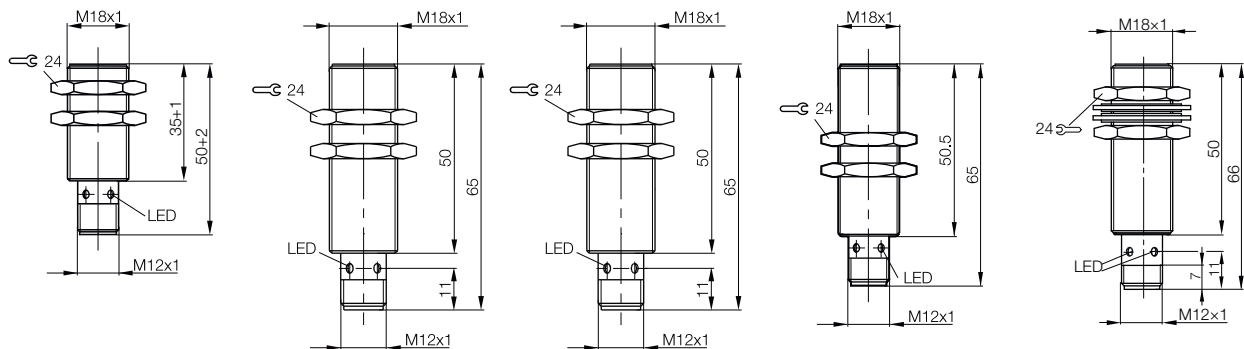
Large Designs

Ring Sensors

Hose Sensors

Analog Distance Measurement

Accessories



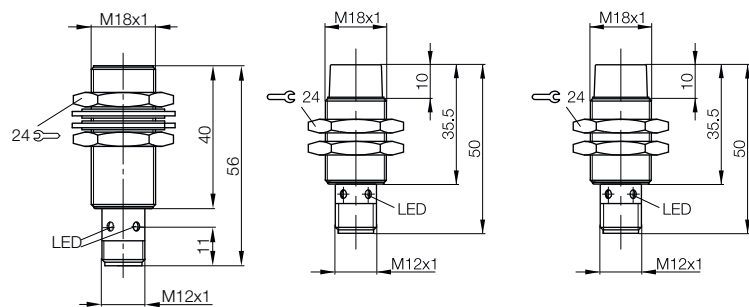
Inductive Sensors with Special Properties

Factor 1 M18x1



Size		M18x1	M18x1	M18x1
Installation type (pay attention to the note in the Basic Information chapter)		Flush	Not flush	Not flush
Rated switching distance s_n		8 mm	12 mm	12 mm
Assured switching distance s_a		0...6.4 mm	0...9.7 mm	0...9.7 mm
Switching distance marking		■	■■	■■
PNP, NO	Ordering code	BES03YU	BES01R2	BES02K7
	Part number	BES M18MI-PSC80A-S04G-W	BES M18MD-PSC12E-S04G	BES M18MD-PSC12E-S04G-W
PNP, NC	Ordering code			
	Part number			
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		3 V	2.5 V	2.5 V
Rated insulation voltage U_i (protection class)		60 V DC (□)	250 V AC (□)	250 V AC (□)
Rated operating current I_e		200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		600 Hz	2.5 kHz	2.5 kHz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Approvals		CE	CE	CE
Special properties		Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields
Material	Housing	Brass, PTFE coated	Brass, coated	Brass, PTFE coated
	Sensing surface	PPS	LCP, PTFE coated	LCP, PTFE coated
Connection		M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.



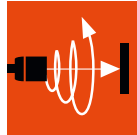


Inductive Sensors with Special Properties

Factor 1 M18x1



M18x1	M18x1	M18x1	M18x1	
Not flush	Not flush	Not flush	Quasi-flush	
12 mm	12 mm	12 mm	12 mm	
0...9.7 mm	0...9.5 mm	0...10.8 mm	0...9.7 mm	
■ ■	■ ■	■ ■	■ ■ ■	
BES02KF	BES02KH		BES03YW	
BES M18ML-PSC12E-S04G-W	BES M18ML-PSC12E-S04G-W01		BES M18MG-PSC12A-S04G-W	
		BES01R0		
		BES M18EL-POC12E-S04G		
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	
2.5 V	2.5 V	2 V	3 V	
250 V AC (□)	250 V AC (□)	250 V AC (□)	60 V DC (□)	
200 mA	200 mA	200 mA	200 mA	
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	
2.5 kHz	2.5 kHz	300 Hz	600 Hz	
Yellow LED	Yellow LED	Yellow LED	Yellow LED	
IP 67	IP 67	IP 67	IP 67	
CE	CE	CE	CE	
Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	
Brass, PTFE coated	Brass, PTFE coated	Stainless steel	Brass, PTFE coated	
LCP, PTFE coated	Ceramic coating	LCP	PPS	
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

AC 2-wire

Special Properties

High-pressure Resistant Sensors

Ex Sensors

Steelface Sensors

High Temperature Rated Sensors

Full PTFE Sensor

Sensors for the Food Industry

Factor 1 Sensors

Weld and Magnetic Field Immune Sensors

Diagnostics Sensors

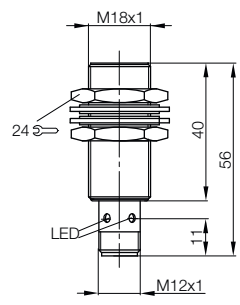
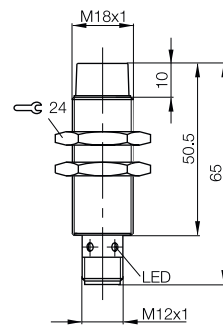
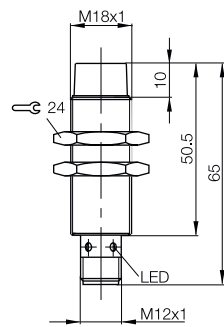
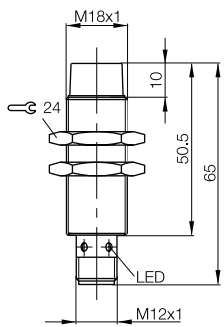
Large Designs

Ring Sensors

Hose Sensors

Analogue Distance Measurement

Accessories



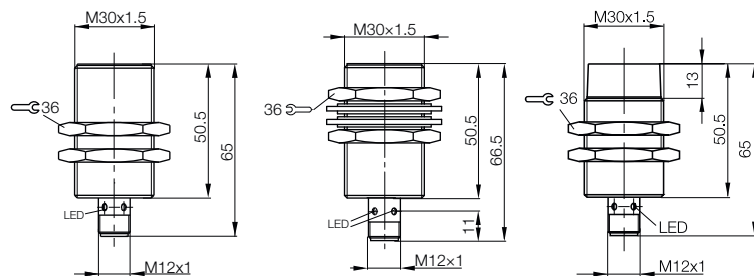
Inductive Sensors with Special Properties

Factor 1
M30x1.5



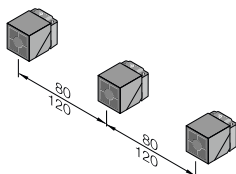
Size		M30x1.5	M30x1.5	M30x1.5
Installation type (pay attention to the note in the Basic Information chapter)		Flush	Flush	Not flush
Rated switching distance s_n		10 mm	15 mm	20 mm
Assured switching distance s_a		0...8.1 mm	0...12.1 mm	0...16 mm
Switching distance marking		■	■■	■
PNP, NO	Ordering code	BES02KM	BES03YY	BES02KP
	Part number	BES M30ML-PSC10A-S04G-W	BES M30MI-PSC15A-S04G-W	BES M30ML-PSC20E-S04G-W
PNP, complementary	Ordering code			
	Part number			
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		2.5 V	3 V	2.5 V
Rated insulation voltage U_i (protection class)		250 V AC (□)	60 V DC (□)	250 V AC (□)
Rated operating current I_e		200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.		600 Hz	250 Hz	1 kHz
Output function/power-on indicator		Yellow LED/No	Yellow LED/No	Yellow LED/No
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Approvals		CE	CE	CE
Special properties		Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields
Material	Housing	Brass, PTFE coated	Brass, PTFE coated	Brass, PTFE coated
	Sensing surface	LCP, PTFE coated	LCP, PTFE coated	LCP, PTFE coated
Possible installation variations				
Connection		M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

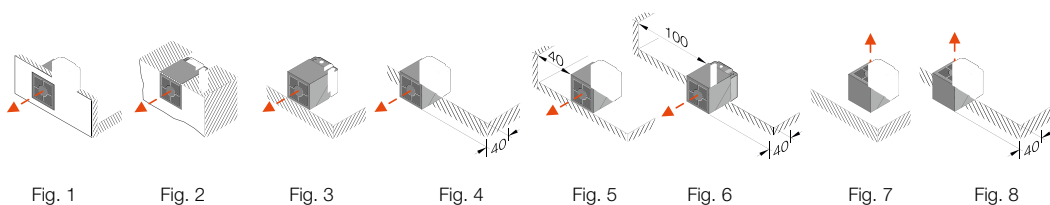


Row mounting

Flush 80 mm
Ø 120 mm non-flush



Permissible installation options





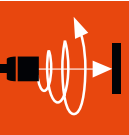
Inductive Sensors with Special Properties



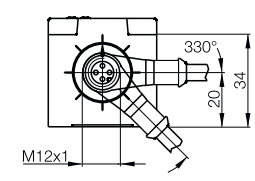
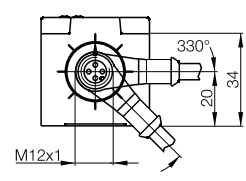
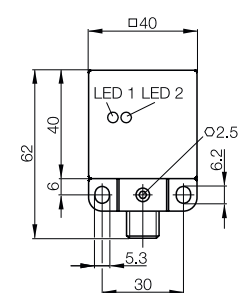
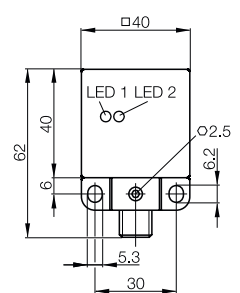
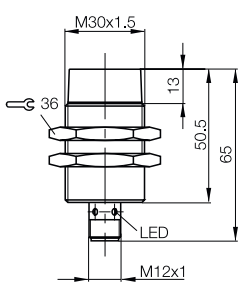
Factor 1 M30x1.5, 40x40 mm Unicomact



M30x1.5	40x40 mm	40x40 mm
Not flush	Flush	Flush
20 mm	15 mm	15 mm
0...16 mm	0...11.9 mm	0...11.9 mm
■	■	■
BES03MZ	BES021P	BES021T
BES M30ML-PSC20E-S04G-W01	BES Q40KFU-PSC15A-S04G	BES Q40KFU-PSC15A-S04G-W01
	BES022K	BES0214
	BES Q40KFU-PAC15A-S04G	BES Q40KFU-PAC15A-S04G-W01
10...30 V DC	10...30 V DC	10...30 V DC
2.5 V	2.5 V	2.5 V
250 V AC (□)	250 V AC (□)	250 V AC (□)
200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C
1 kHz	400 Hz	400 Hz
Yellow LED/No	Green LED/Yellow LED	Green LED/Yellow LED
IP 67	IP 67	IP 67
CE	CE	CE
Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields
Brass, PTFE coated Ceramic coating	PBT PBT	PBT, ceramic coating PBT, ceramic coating
	Image 1...8	Image 1...8
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin



- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- High-pressure Resistant Sensors
- Ex Sensors
- Steelface Sensors
- High-temperature Rated Sensors
- Full PTFE Sensor
- Sensors for the Food Industry
- Factor 1 Sensors**
- Weld and Magnetic Field Immune Sensors
- Diagnostics Sensors
- Large Designs
- Ring Sensors
- Hose Sensors
- Analogue Distance Measurement
- Accessories



Inductive Sensors with Special Properties

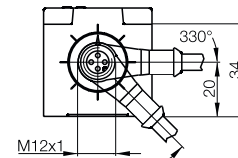
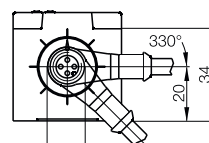
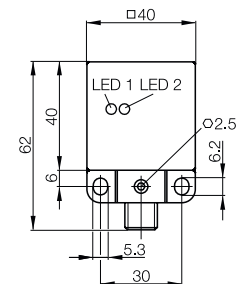
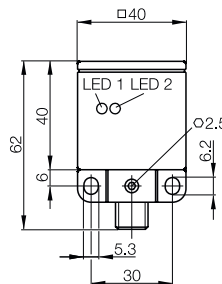
Factor 1

40x40 mm Unicomact



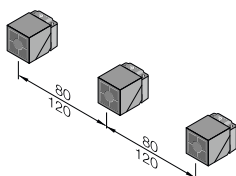
Size		40x40 mm	40x40 mm
Installation type (pay attention to the note in the Basic Information chapter)		Flush	Not flush
Rated switching distance s_n		20 mm	25 mm
Assured switching distance s_a		0...16 mm	0...20.2 mm
Switching distance marking		■ ■	■
PNP, NO	Ordering code	BES021U	
	Part number	BES Q40KFU-PSC20A-S04G	
PNP, complementary	Ordering code	BES0216	BES021A
	Part number	BES Q40KFU-PAC20A-S04G	BES Q40KFU-PAC25E-S04G
Supply voltage U_s		10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		2.5 V	2.5 V
Rated insulation voltage U_i (protection class)		250 V AC (□)	250 V AC (□)
Rated operating current I_e		200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C
Switching frequency f max.		400 Hz	250 Hz
Output function/power-on indicator		Green LED/Yellow LED	Green LED/Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67
Approvals		CE	CE
Special properties		Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields
Material	Housing	PBT	PBT
	Sensing surface	PBT	PBT
Possible installation variations		Image 1...8	Image 3...8
Connection		M12 connector, 4-pin	M12 connector, 4-pin

Wiring diagrams, see page 958.
Switching distance markings can be found on page 962.

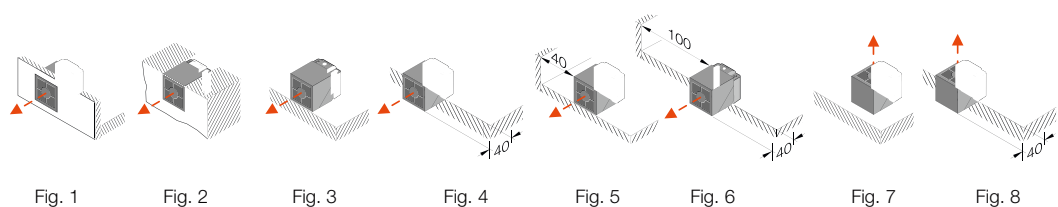


Row mounting

Flush 80 mm
Ø 120 mm non-flush



Permissible installation options

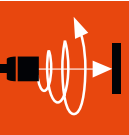




Factor 1
40x40 mm Unicomact



40x40 mm	40x40 mm	40x40 mm
Not flush	Not flush	Not flush
35 mm	35 mm	40 mm
0...28.4 mm	0...28.1 mm	0...32.4 mm
■	■	■ ■
BES0220	BES0221	BES0223
BES Q40KFU-PSC35E-S04G	BES Q40KFU-PSC35E-S04G-W01	BES Q40KFU-PSC40E-S04G
BES021H	BES021K	
BES Q40KFU-PAC35E-S04G	BES Q40KFU-PAC35E-S04G-W01	
10...30 V DC	10...30 V DC	10...30 V DC
2.5 V	2.5 V	2.5 V
250 V AC (□)	250 V AC (□)	250 V AC (□)
200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-10...+70 °C	-10...+70 °C	-10...+70 °C
250 Hz	250 Hz	100 Hz
Green LED/Yellow LED	Green LED/Yellow LED	Green LED/Yellow LED
IP 67	IP 67	IP 67
CE	CE	CE
Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields
PBT	PBT, ceramic coating	PBT
PBT	PBT, ceramic coating	PBT
Image 3...8	Image 4...8	Image 4...8
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

AC 2-wire

Special Properties

High-pressure Resistant Sensors

Ex Sensors

Steelface Sensors

High-temperature Rated Sensors

Full PTFE Sensor

Sensors for the Food Industry

Factor 1 Sensors

Weld and Magnetic Field Immune Sensors

Diagnostics Sensors

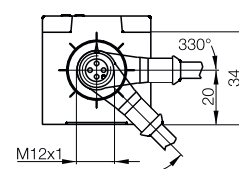
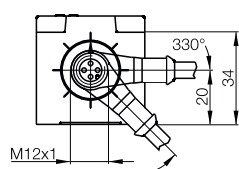
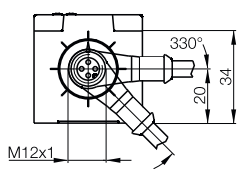
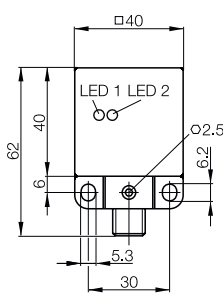
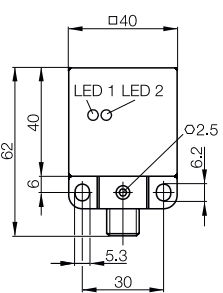
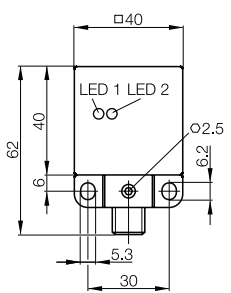
Large Designs

Ring Sensors

Hose Sensors

Analogue Distance Measurement

Accessories



Magnetic Field Immune, Weld-immune

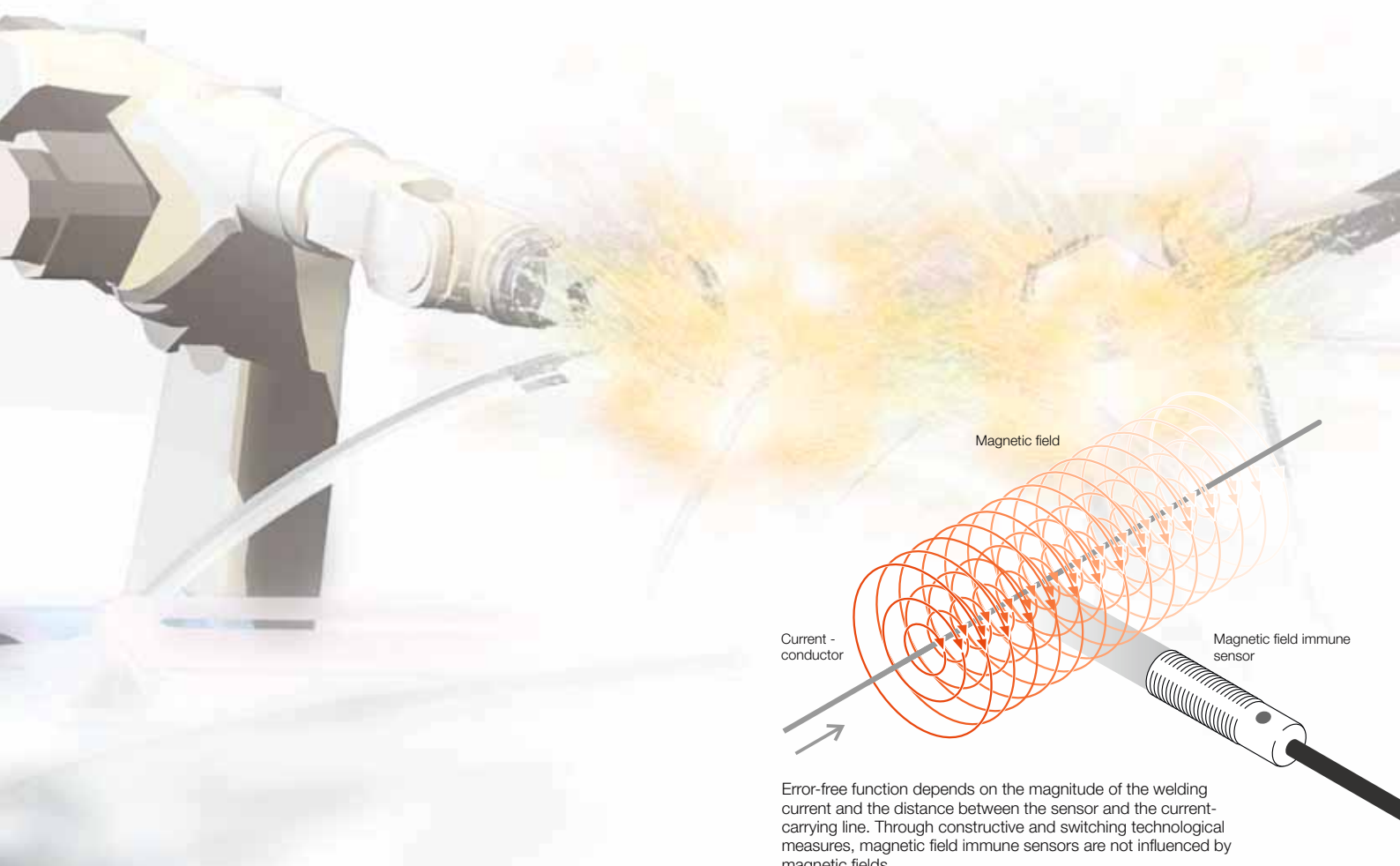
Weld-immune sensors – the all-rounder for rough industrial applications

Magnetic field immune: Insensitive to magnetic fields which can be created with electrical currents of up to 25 kA (at a distance from energetic conductors of approx. 5 cm).

Weld spatter resistant: Resistant to metal splatter, slag and combustion residue, which are created during welding processes.

Factor 1: Identical switching distance for steel, stainless, aluminum or brass.

Note about the part number: BES ...-W01 means ceramic coating. Rugged ceramic coating with thick layers for the most extreme welding environments.

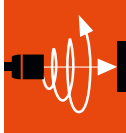


Error-free function depends on the magnitude of the welding current and the distance between the sensor and the current-carrying line. Through constructive and switching technological measures, magnetic field immune sensors are not influenced by magnetic fields.

Inductive Sensors with Special Properties

Magnetic field immune sensors

M12x1



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

AC 2-wire

Special Properties

High-pressure Resistant Sensors

Ex Sensors

Steelface Sensors

High-temperature Rated Sensors

Full PTFE Sensor

Sensors for the Food Industry

Factor 1 Sensors

Weld and Magnetic Field Immune Sensors

Diagnostics Sensors

Large Designs

Ring Sensors

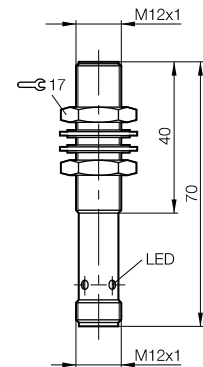
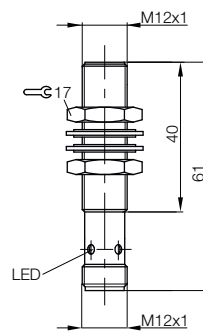
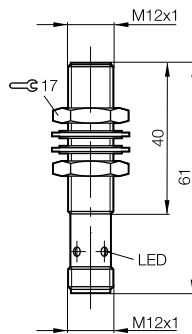
Hose Sensors

Analog Distance Measurement

Accessories

Size	M12x1	M12x1	M12x1
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush	Flush
Rated switching distance s_n	2 mm	2 mm	2 mm
Assured switching distance s_a	1.6 mm	1.6 mm	1.6 mm
Switching distance marking	■	■	■
PNP, NO	Ordering code	BES02J6	BES02J5
	Part number	BES 516-325-S4-W	BES 516-325-S4-CW
Supply voltage U_s	10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.	2.5 V	2.5 V	2.5 V
Rated insulation voltage U_i (protection class)	250 V AC (II)	250 V AC (II)	75 V DC
Rated operating current I_e	200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a	-25...+70 °C	-25...+70 °C	-25...+70 °C
Switching frequency f max.	1 kHz	1 kHz	1 kHz
Output function indicator	Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67
Approvals	CE	CE	CE
Special properties	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields
Material	Housing	Brass, PTFE coated	Stainless steel, PTFE coated
	Sensing surface	LCP, PTFE coated	PTFE
Connection		M12 connector, 4-pin	M12 connector, 4-pin

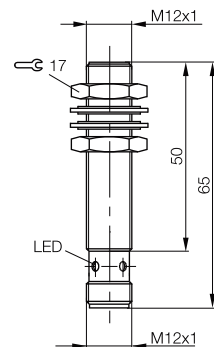
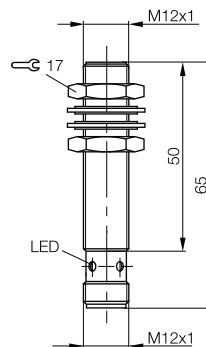
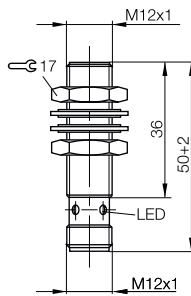
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.





Size	M12x1	M12x1	M12x1
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush	Flush
Rated switching distance s_n	3 mm	3 mm	3 mm
Assured switching distance s_a	2.2 mm	2.4 mm	2.2 mm
Switching distance marking	■ ■	■ ■	■ ■
PNP, NO	Ordering code	BES02K1	BES02K2
	Part number	BES M12MF1-PSC30A-S04G-W01	BES M12MI-PSC30B-S04G-W01
Supply voltage U_s	10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.	2.5 V	2.5 V	2.5 V
Rated insulation voltage U_i (protection class)	250 V AC (□)	250 V AC (□)	250 V AC (□)
Rated operating current I_e	200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a	-25...+70 °C	-5...+60 °C	-5...+60 °C
Switching frequency f max.	2 kHz	300 Hz	300 Hz
Output function indicator	Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67
Approvals	CE	CE	CE
Special properties	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields
Material	Housing	Brass, PTFE coated	Brass, PTFE coated
	Sensing surface	Ceramic coating	LCP, PTFE coated
Connection	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.



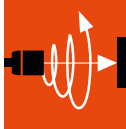
Inductive Sensors with Special Properties

Magnetic field immune sensors

M12x1, M18x1



M12x1	M12x1	M18x1	M18x1	M18x1
Not flush	Not flush	Flush	Flush	Flush
4 mm	8 mm	5 mm	5 mm	5 mm
3.2 mm	6.3 mm	3.9 mm	4 mm	4 mm
■	■ ■	■	■	■
BES02JN	BES02JY	BES02KA	BES02JA	BES02JC
BES 516-356-S4-W	BES M12MD1-PSC80E-S04G-W01	BES M18MF1-PSC50A-S04G-W01	BES 516-326-S4-W	BES 516-326-S4-WR
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2.5 V	2.5 V	2.5 V	1.5 V	2.5 V
250 V AC (□)	250 V AC (□)	250 V AC (□)	250 V AC (□)	75 V DC
200 mA	200 mA	200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
1 kHz	2 kHz	2.5 kHz	500 Hz	100 Hz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67	IP 67
CE	CE	CE	CE	CE
Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields
Stainless steel, PTFE coated	Brass, PTFE coated	Brass, PTFE coated	Brass, PTFE coated	Brass, PTFE coated
PTFE	Ceramic coating	Ceramic coating	PTFE	Ceramic
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

AC 2-wire

Special Properties

High-pressure Resistant Sensors

Ex Sensors

Steelface Sensors

High-temperature Rated Sensors

Full PTFE Sensor

Sensors for the Food Industry

Factor 1 Sensors

Sensors

Weld and Magnetic Field Immune Sensors

Diagnostics Sensors

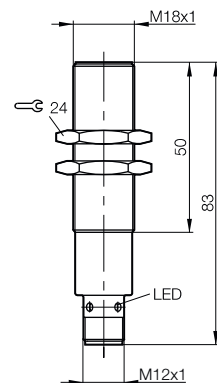
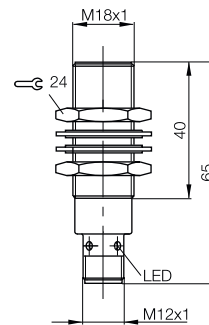
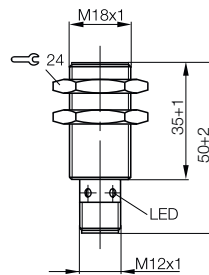
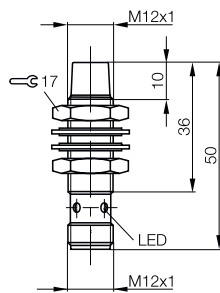
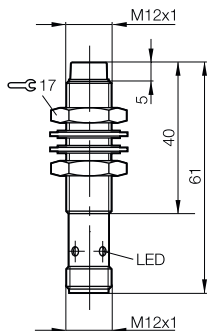
Large Designs

Ring Sensors

Hose Sensors

Analog Distance Measurement

Accessories

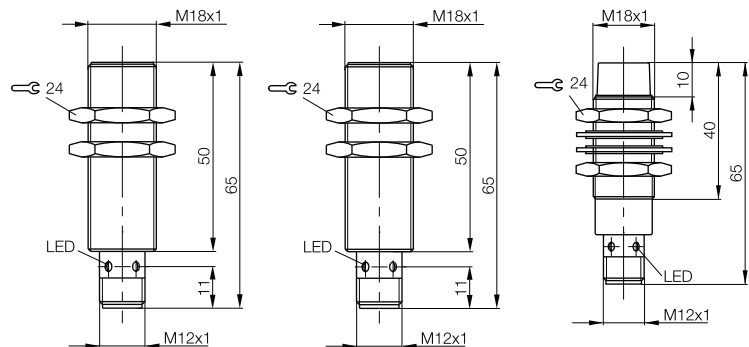




Size		M18x1	M18x1	M18x1
Installation type (pay attention to the note in the Basic Information chapter)		Flush	Flush	Not flush
Rated switching distance s_n		7 mm	7 mm	8 mm
Assured switching distance s_a		5.6 mm	5.5 mm	6.4 mm
Switching distance marking		■ ■	■ ■	■
PNP, NO	Ordering code	BES02KC	BES02KE	BES02JR
	Part number	BES M18MI-PSC70B-S04G-W	BES M18MI-PSC70B-S04G-W01	BES 516-360-S4-W
Supply voltage U_s		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		2.5 V	2.5 V	1.5 V
Rated insulation voltage U_i (protection class)		250 V AC (II)	250 V AC (II)	75 V DC
Rated operating current I_e		200 mA	200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-5...+60 °C	-5...+60 °C	-25...+70 °C
Switching frequency f max.		50 Hz	50 Hz	200 Hz
Output function indicator		Yellow LED	Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67	IP 67
Approvals		CE	CE	CE
Special properties		Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields
Material	Housing	Brass, PTFE coated	Brass, PTFE coated	Brass, PTFE coated
	Sensing surface	LCP, PTFE coated	Ceramic coating	PTFE
Connection		M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

Wiring diagrams, see page 958.

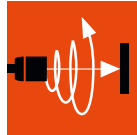
The meaning of switching distance markings can be found on page 962.



Inductive Sensors with Special Properties

Magnetic field immune sensors

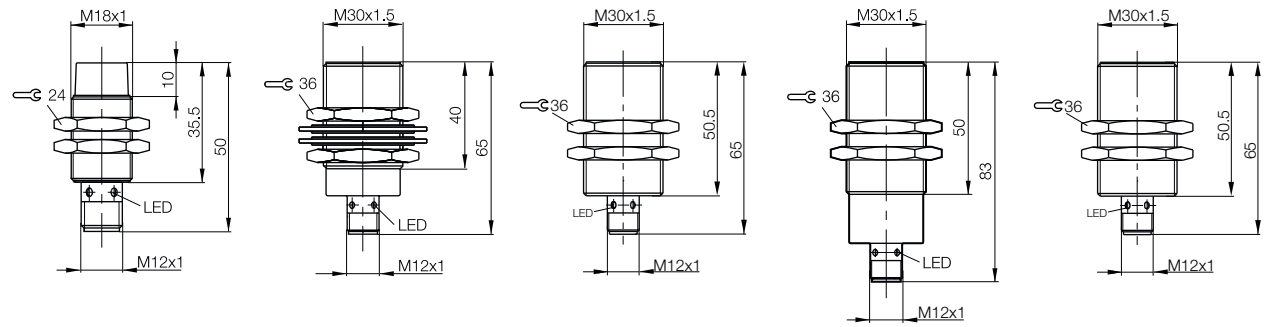
M18x1, M30x1.5



- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- High-pressure Resistant Sensors
- Ex Sensors
- Steelface Sensors
- High Temperature Rated Sensors
- Full PTFE Sensor
- Sensors for the Food Industry
- Factor 1 Sensors
- Weld and Magnetic Field Immune Sensors**
- Diagnostics Sensors
- Large Designs
- Ring Sensors
- Hose Sensors
- Analog Distance Measurement
- Accessories



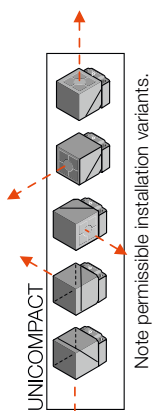
M18x1	M30x1.5	M30x1.5	M30x1.5	M30x1.5	M30x1.5
Not flush	Flush	Flush	Flush	Flush	Flush
12 mm	10 mm	10 mm	10 mm	10 mm	13 mm
9.5 mm	8.1 mm	7.9 mm	8.1 mm	8.1 mm	10.5 mm
■ ■	■	■	■	■	■
BES02K8	BES02JJ	BES02KN	BES02JK	BES02KL	BES02KL
BES M18MD-PSC12E-S04G-W01	BES 516-327-S4-W	BES M30ML-PSC10A-S04G-W01	BES 516-327-S4-WR	BES M30MI-PSC13B-S04G-W	BES M30MI-PSC13B-S04G-W
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2.5 V	1.5 V	2.5 V	2.5 V	2.5 V	2.5 V
250 V AC (□)	250 V AC (□)	250 V AC (□)	75 V DC	250 V AC (□)	250 V AC (□)
200 mA	200 mA	200 mA	200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-5...+60 °C
2.5 Hz	100 Hz	600 Hz	50 Hz	30 Hz	30 Hz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
CE	CE	CE	CE	CE	CE
Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields
Brass, PTFE coated	Brass, PTFE coated	Brass, PTFE coated	Brass, PTFE coated	Brass, PTFE coated	Brass, PTFE coated
Ceramic coating	PTFE	Ceramic coating	Ceramic	LCP, PTFE coated	LCP, PTFE coated
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin





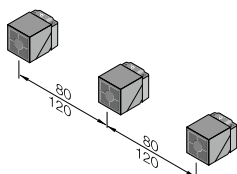
Size		M30x1.5	M30x1.5
Installation type (pay attention to the note in the Basic Information chapter)		Flush	Not flush
Rated switching distance s_n		13 mm	15 mm
Assured switching distance s_a		10.3 mm	12.2 mm
Switching distance marking		■	■
PNP, NO	Ordering code	BES03F1	BES02JU
	Part number	BES M30MI-PSC13B-S04G-W01	BES 516-362-S4-W
PNP, complementary	Ordering code		
	Part number		
Supply voltage U_s		10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		2.5 V	1.5 V
Rated insulation voltage U_i (protection class)		250 V AC (II)	250 V AC (II)
Rated operating current I_e		200 mA	200 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-5...+60 °C	-25...+70 °C
Switching frequency f max.		30 Hz	100 Hz
Output function/power-on indicator		Yellow LED/No	Yellow LED/No
Degree of protection as per IEC 60529		IP 67	IP 67
Approvals		CE	CE
Special properties		Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields
Material	Housing	Brass, PTFE coated	Brass, PTFE coated
	Sensing surface	Ceramic coating	PTFE
Possible installation variations			
Connection		M12 connector, 4-pin	M12 connector, 4-pin

Wiring diagrams, see page 958. The meaning of switching distance markings can be found on page 962.

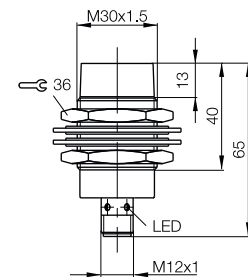
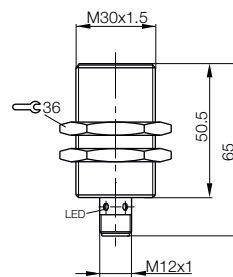
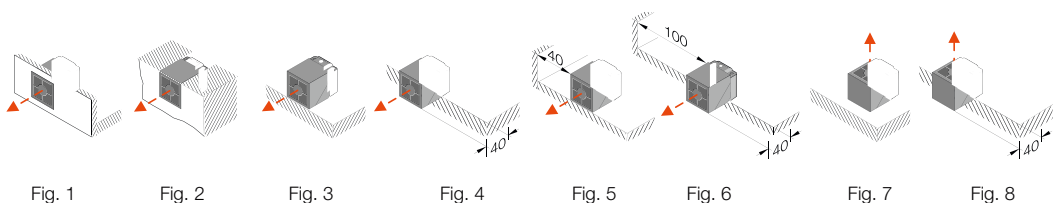


Row mounting

Flush 80 mm
Ø 120 mm non-flush



Permissible installation options



Inductive Sensors with Special Properties

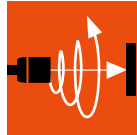
Magnetic field immune sensors 32x20x8 mm R01, 40x40 mm Unicomact



Factor 1

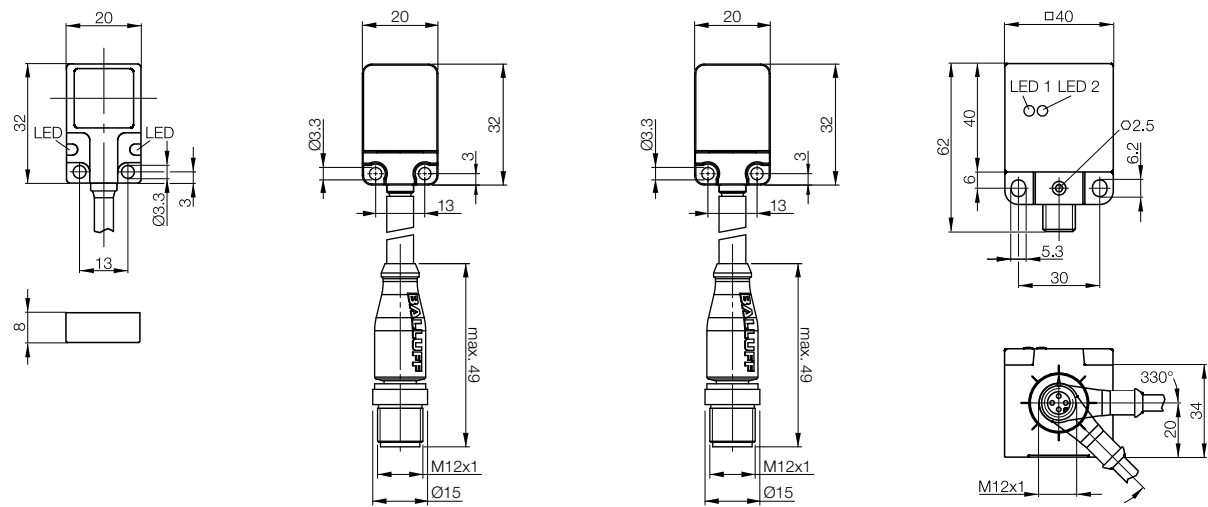
Factor 1

32x20x8 mm R01	20x32x8 mm R01	20x32x8 mm R01	40x40x62 mm
Flush	Flush	Flush	Not flush
5 mm	5 mm	5 mm	40 mm
4 mm	0..4 mm	0..4 mm	32.4 mm
■	■	■	■ ■
BES0483	BES04AH	BES049Y	
BES R01ZC-PSC50B-BZ05-W05	BES R01EC-PSC50A-BP00,3-GS04-W50	BES R01EC-PSC50A-BP00,3-GS04-W51	
			BES02JR
			BES Q40KFU-PAC40E-S04G
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2.5 V	1.5 V	1.5 V	2.5 V
75 V DC	75 V DC	75 V DC	250 V AC (□)
200 mA	200 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	0...+50 °C	0...+50 °C	-10...+70 °C
100 Hz	20 Hz	20 Hz	100 Hz
Green LED/Yellow LED	Yellow LED/green LED in the connector	Yellow LED/green LED in the connector	Green LED/Yellow LED
IP 67	IP 60	IP 60	IP 67
CE	CE, cULus	CE, cULus	CE
Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields, Factor 1	Interference-proof against magnetic AC and DC fields, Factor 1	Interference-proof against magnetic AC and DC fields
Cast zinc	Stainless steel	Stainless steel	PBT
Ceramic coating	Stainless steel	Stainless steel	PBT
5 m PUR cable 3x0.25 mm ²	0.3 m PUR cable with silicone sheath and M12 connector, 3-pin	0.3 m PUR cable with silicone sheath and M12 connector, 3-pin	Image 3...8 M12 connector, 4-pin



- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- High-pressure Resistant Sensors
- Ex Sensors
- Steelface Sensors
- High Temperature Rated Sensors
- Full PTFE Sensor
- Sensors for the Food Industry
- Factor 1 Sensors

- Weld and Magnetic Field Immune Sensors**
- Diagnostics Sensors
- Large Designs
- Ring Sensors
- Hose Sensors
- Analog Distance Measurement
- Accessories





DESINA sensors with diagnostic output

Inductive sensors with the DESINA specification are developed for demanding use in machine tools. The additional diagnostic- output monitors the function of the switch and the supply feed. As long as the sensor is functional, a high- signal is emitted. Balluff sensors with the DESINA specification meet the requirements of ISO 23570 Part 1: "Industrial automation systems and integration – Distributed installation in industrial applications – Part 1: Sensors and actuators".

Inductive sensors high pressure rated to 500 bar, with diagnostics and setup aid.

This high pressure rated inductive sensor is used for position sensing of the piston position in hydraulic cylinders. Therefore its sensing surface is extremely resistant. The optical setup aid indicates when the optimum distance of the sensing face from the piston has been reached. This simplifies installation and helps to prevent damage to the sensor.

Note

For reliable function monitoring, plug connectors without function indicators have to be used.

Additional Features

Factor 1 sensors identify objects, such as those made of steel, aluminum or brass, with identical switching distances (without reduction factor). This property offers advantages in applications where the material of the objects to be detected can vary. All Factor 1 sensors are **magnetic field immune**. Their function is not impaired by strong electromagnetic fields (such as from induction hardening- or welding equipment). Factor 1 sensors are not affected in their switching behavior by weld currents up to 25 kA.

Note on part numbering

BES ...-**M01**: Diagnostic output for monitoring sensor and cable function. As long as the sensor is functional, a high- signal is emitted on the monitor output.

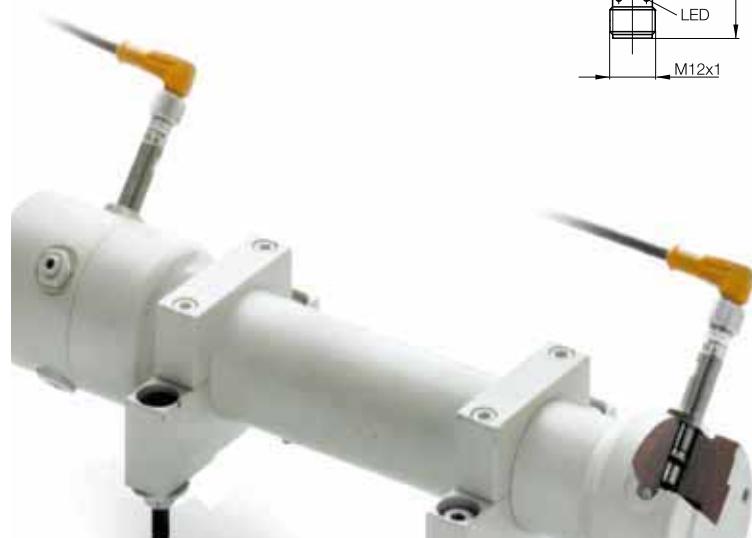
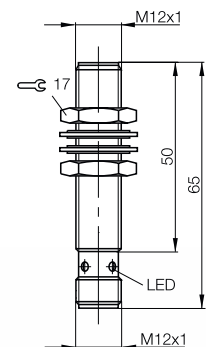
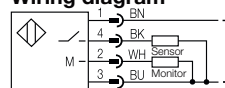
BES ...-**WM01**: Diagnostic output and PTFE coating (weld spatter resistant)



Size	M12x1
Installation type (pay attention to the note in the Basic Information chapter)	Flush
Rated switching distance s_n	2 mm
Assured switching distance s_a	0...1.6 mm
Switching distance marking	■
PNP, NO	Ordering code
	Part number
	BES01ZL
	BES M12MI-PSC20B-S04G-M01
Supply voltage U_S	10...30 V DC
Voltage drop U_d at I_o max.	≤ 2.5 V
Rated insulation voltage U_i (protection class)	250 V AC (II)
Rated operating current I_o	200 mA
Monitor output load capacity	max. 50 mA
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes
Ambient temperature T_a	-25...+70 °C
Switching frequency f max.	2 kHz
Output function/power-on indicator	Yellow LED/No
Degree of protection as per IEC 60529	IP 68 per BWN Pr. 20
Approvals	CE, cULus
Material	Housing Sensing surface
	Brass, coated LCP
O-ring/spare part number	
Support ring/spare part number	
Connection	M12 connector, 4-pin
High pressure rated to	

The meaning of switching distance markings can be found on page 962.

Wiring diagram



Inductive Sensors with Special Properties

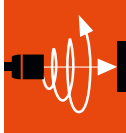


DESINA diagnostic sensors M12x1, M12x1 high-pressure resistant, M18x1, 40x40 Unicomact



Weld immune
Magnetic
field immune
Factor 1

Magnetic
field immune
Factor 1



Inductive
Sensors

Global
DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

AC 2-wire

Special
Properties

High-pressure
Resistant Sen-
sors

Ex Sensors

Steelface
Sensors

High Tem-
perature Rated
Sensors

Full PTFE Sensor

Sensors for
the Food
Industry

Factor 1
Sensors

Weld and
Magnetic Field
Immune Sensors

Diagnostics
Sensors

Large
Designs

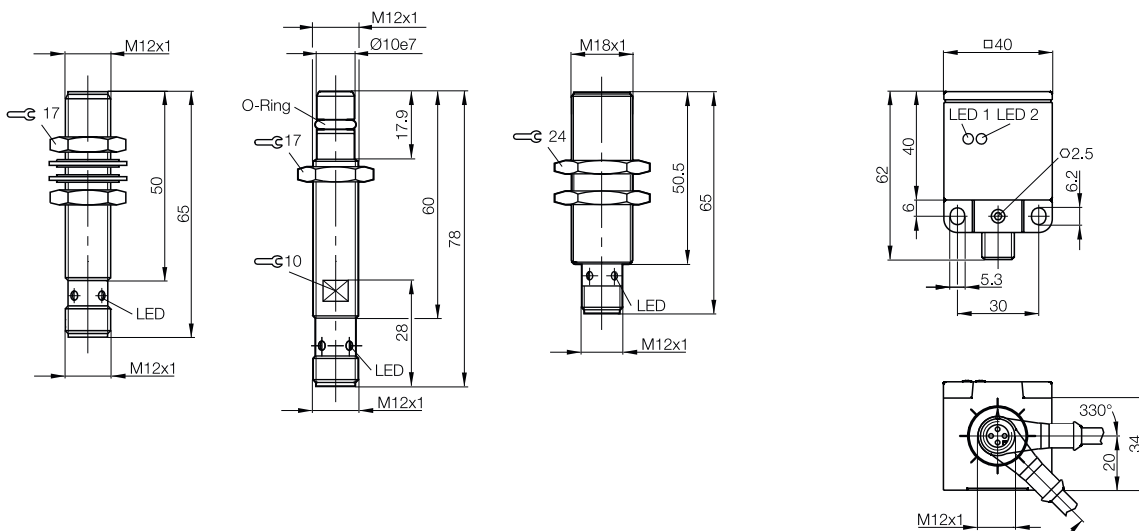
Ring Sensors

Hose Sensors

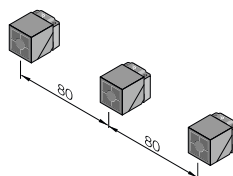
Analog
Distance
Measurement

Accessories

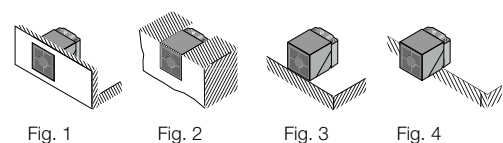
M12x1	M12x1	M18x1	40x40x62 mm Unicomact
Flush	Flush	Flush	Flush
4 mm	1.5 mm	5 mm	15 mm
0...3.2 mm	0...1.2 mm	0...4.1 mm	0...12.2 mm
■ ■	■	■	■
BES01ZM	BHS006C	BES0200	BES021R
BES M12MI-PSC40B-S04G-M01	BES M12EL-PSC15B-S04G-HM01	BES M18MI-PSC50A-S04G-WM01	BES Q40KFU-PSC15A-S04G-M01
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
≤ 2.5 V	3.7 V	≤ 3.5 V	≤ 3.5 V
250 V AC (□)	75 V AC	250 V AC (□)	250 V AC (□)
200 mA	200 mA	200 mA	200 mA
max. 50 mA	max. 50 mA	max. 50 mA	max. 50 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
1 kHz	300 Hz	15 Hz	13 Hz
Yellow LED/No	Yellow LED	Yellow LED/No	Green LED/Yellow LED
IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus
Brass, coated	Stainless steel	Brass, coated	PBT
LCP	EP	LCP, PTFE-coated	PBT
	5.3x2.4/631753		
	10x5.9x1/705918		
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin
	500 bar		



Row mounting
Flush 80 mm

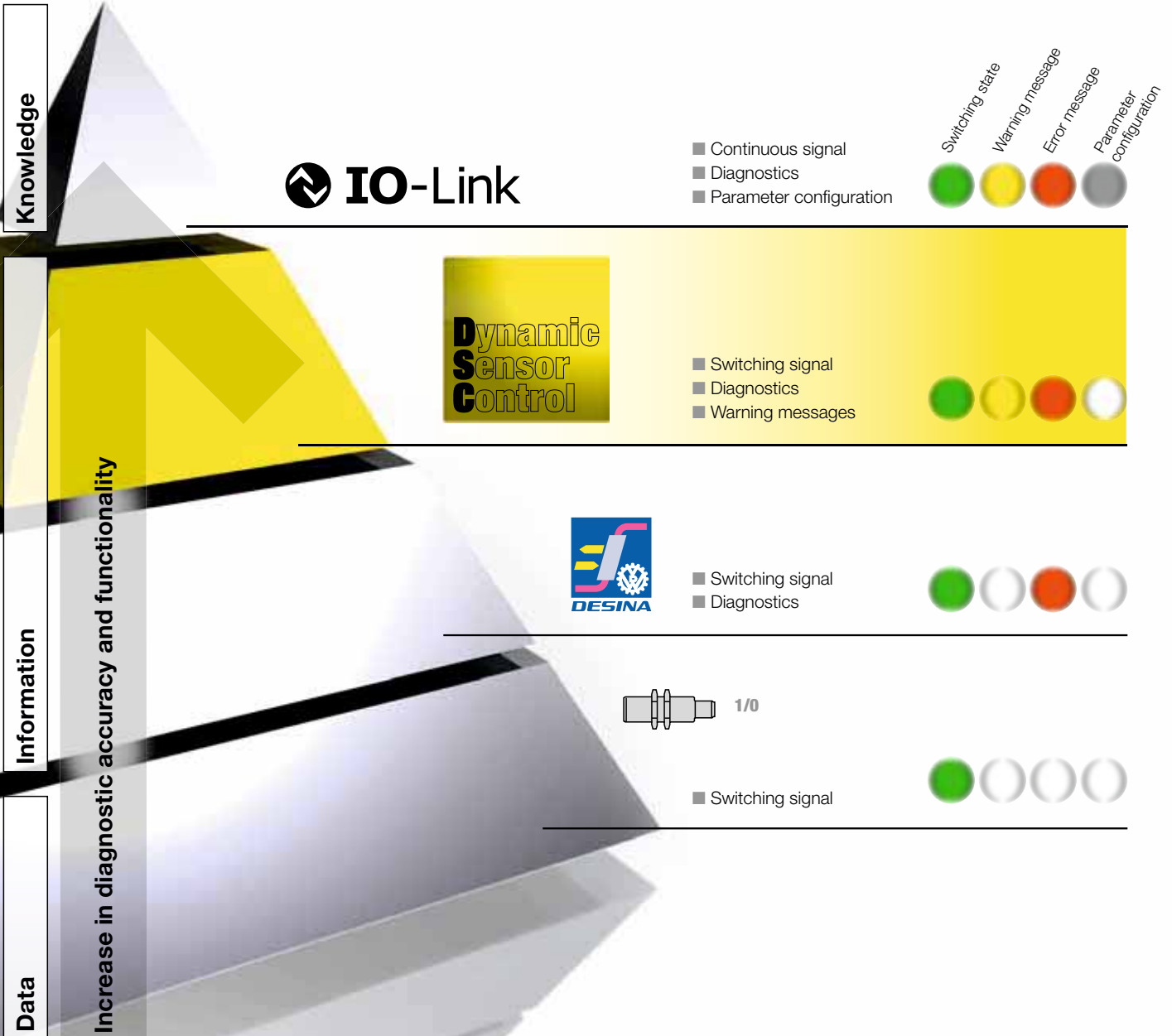


Installation variations



Dynamic Sensor Control increases the value of your machine concepts through

- Increased availability
- Simpler and more efficient commissioning
- More efficient maintenance



Function

Sensors with dynamic function diagnostics enable monitoring of the sensor functions, including the connection lines. In addition, the oscillator state is changed by means of a pulse generator while the switch is operating. As soon as there is any damage to the sensor head or the oscillator fails electrically, the pulse generator can no longer change the oscillator state and there are no longer pulses on the output.

The pulse frequency is $f \sim 160$ Hz and the pulse duration $t \sim 300 \mu s$. The pulse-/pause ratio of $t \sim 5\%$ is selected small enough that the test pulses can be filtered out by the input filter of a controller, or, for example, a relay can be directly controlled. The information "proximity switch -damped or undamped" can therefore be evaluated in the usual fashion.

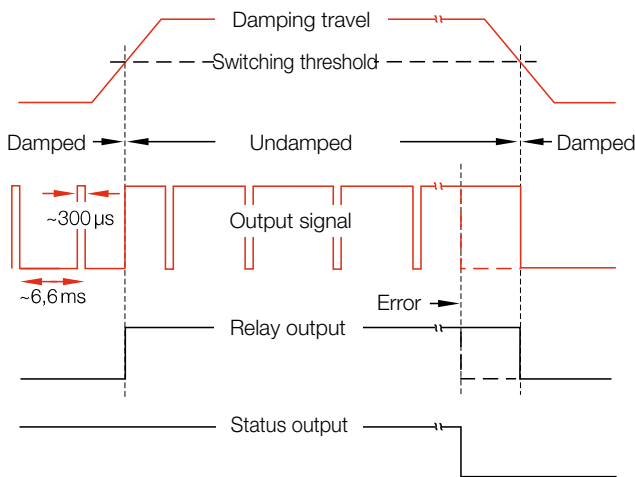
Function monitoring

The test pulses, and with them the sensor function, are monitored by an additional electronics system, which signal error-free function by means of a high level on the "Status/Output" message- output.

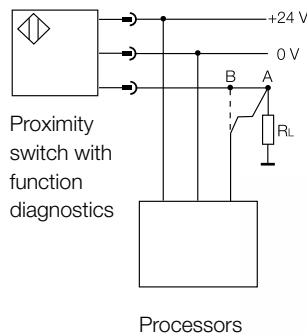
Balluff offers a function diagnostics unit which can be easily installed in a controller:

- Function diagnostic unit (see accessories for inductive sensors)
- BES 113-FD-1 (for 1 sensor)

The following may be connected:
Inductive sensors BES 113-356-SA6-S4 (normally open function), BES 113-356-SA31-S4 (normally open function), BES 113-3019-SA1-S4 (normally closed function) and the capacitive sensors BCS 20MG10-XPA1Y-8B-03 (complementary)



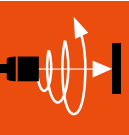
Pulse diagram of a proximity switch with function diagnostics (normally closed).



Installation note

The signal line to the function diagnostics unit should be connected as close as possible to the load R_L (point A). When Point B is connected the cable segment between B and load R_L is not monitored.

The system described here is not suitable for systems with protection for persons. For additional information, please request a device description.



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

AC 2-wire

Special Properties

High-pressure Resistant Sensors

Ex Sensors

Steelface Sensors

High Temperature Rated Sensors

Full PTFE Sensor

Sensors for the Food Industry

Factor 1 Sensors

Weld and Magnetic Field Immune Sensors

Diagnostics Sensors

Large Designs

Ring Sensors

Hose Sensors

Accessories

Analog Distance Measurement

Accessories

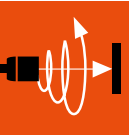




Size		
Installation type (pay attention to the note in the Basic Information chapter)		
Rated switching distance s_n		
Assured switching distance s_a		
Switching distance marking		
PNP, NO	Ordering code	
	Part number	
PNP, NC	Ordering code	
	Part number	
Supply voltage U_S		
Voltage drop U_d at I_o max.		
Rated insulation voltage U_i (protection class)		
Rated operating current I_o		
Minimum operating current I_m		
Output resistance R_a		
Polarity reversal protected/transposition protected/short-circuit protected		
Actual switching distance s		
Ambient temperature T_a		
Switching frequency f max.		
Degree of protection as per IEC 60529		
Approvals		
Material	Housing	
	Sensing surface	
Connection		

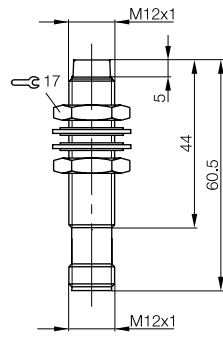
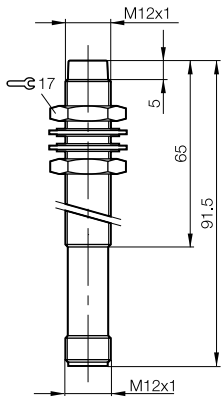
Note

For function diagnostics switches with connector option, do not use connectors with integrated LED- function indicator, since the LED is parallel to the load R_L and cable break monitoring is then no longer assured.
 The switch function can however be monitored on the LEDs in the processor unit.



M12x1	M12x1
Not flush	Not flush
3.7 mm	4 mm
0...3 mm	0...3 mm
■	■
BES02MC	BES02M8
BES 113-356-SA6-S4	BES 113-356-SA31-S4
BES02M5	
BES 113-3019-SA1-S4	
20...30 V DC	20...30 V DC
Typ. 2.5 V	Typ. 3.5 V
75 V AC	75 V AC
130 mA	130 mA
1 mA	5 mA
Open collector	Open collector
Yes/Yes/Yes	Yes/Yes/Yes
3.7 mm +20 %/-10 %	4 mm +20 %/-10 %
-25...+70 °C	0...+70 °C
300 Hz	300 Hz
IP 67	IP 67
CE	CE
Brass-coated	Brass-coated
PA 12	LCP
M12 connector, 4-pin, (cable length ≤ 50 m to the controller)	M12 connector, 4-pin, (cable length ≤ 50 m to the controller)

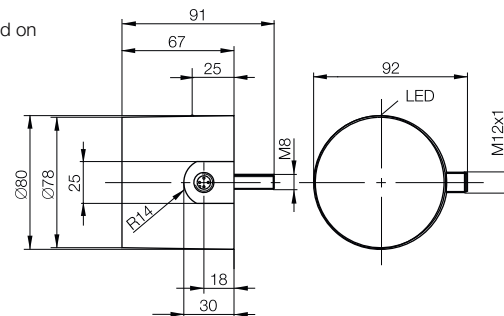
- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- High-pressure Resistant Sensors
- Ex Sensors
- Steelface Sensors
- High Temperature Rated Sensors
- Full PTFE Sensor
- Sensors for the Food Industry
- Factor 1 Sensors
- Weld and Magnetic Field Immune Sensors
- Diagnostics Sensors**
- Large Designs
- Ring Sensors
- Hose Sensors
- Analogue Distance Measurement
- Accessories





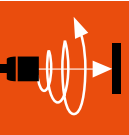
Size	Ø 80x67 mm	
Installation type (pay attention to the note in the Basic Information chapter)	Not flush	
Rated switching distance s_n	50 mm	
Assured switching distance s_a	0...40.5 mm	
Switching distance marking	■	
PNP, NO	Ordering code	BES02RN
	Part number	BES IKJ-S-050-P-2-S-S4-C
PNP, complementary	Ordering code	
	Part number	
Supply voltage U_s	10...55 V DC	
Voltage drop U_d at I_e max.	2 V	
Rated insulation voltage U_i	75 V DC	
Rated operating current I_e	200 mA	
Output resistance R_a	Open collector	
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	
Ambient temperature T_a	-25...+70 °C	
Switching frequency f max.	100 Hz	
Output function/power-on indicator	Red LED/No	
Degree of protection as per IEC 60529	IP 67	
Approvals	CE	
Material	Housing	PBT
	Sensing surface	PBT
Connection	M12 connector, 4-pin	

Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.



Inductive Sensors with Special Properties

Large designs



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

AC 2-wire

Special Properties

High-pressure Resistant Sensors

Ex Sensors

Steelface Sensors

High Temperature Rated Sensors

Full PTFE Sensor

Sensors for the Food Industry

Factor 1 Sensors

Weld and Magnetic Field Immune Sensors

Diagnostics Sensors

Large Designs

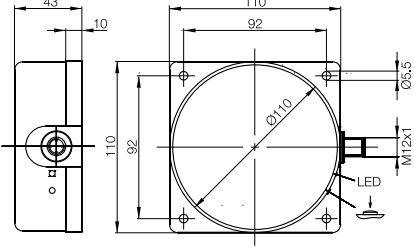
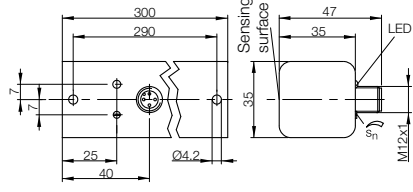
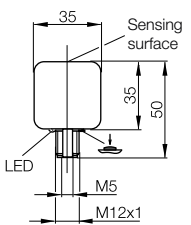
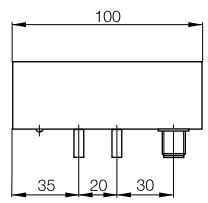
Ring Sensors

Hose Sensors

Analogue Distance Measurement

Accessories

35x35x100 mm	35x35x300 mm	110x110x43 mm
Not flush	Not flush	Not flush
30 mm (adjustable with teach-in key)	30 mm (adjustable)	70 mm (adjustable with teach-in key)
0...24.3 mm	0...24.3 mm	0...56.7 mm
■	■	■
BES02TF	BES02TN	BES02RU
BES IKU-011T.28-G-S4	BES IKU-031.28-S4	BES IKN-070T.38-G-S4
10...30 V DC	10...30 V DC	10...55 V DC
2 V	2 V	2 V
75 V DC	75 V DC	75 V DC
400 mA	200 mA	200 mA
Open collector	Open collector	Open collector
Yes/Yes/Yes	Yes/Yes/No	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	0...+70 °C
50 Hz	50 Hz	50 Hz
Red LED/No	Red LED/No	Red LED/Green LED (1 LED with color change)
IP 65	IP 65	IP 67
CE	CE	CE
PVC	PVC	PBT
PVC	PVC	PBT
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin





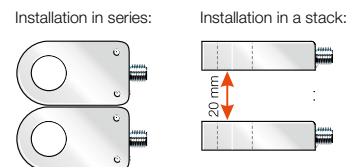
Size	
Installation type (pay attention to the note in the Basic Information chapter)	
Inside diameter d_w	
Minimum object size steel taper (St 37)	
Target velocity max.	
PNP, NO	Ordering code
	Part number
Supply voltage U_S	
Voltage drop U_d at I_o max.	
Rated insulation voltage U_i	
Rated operating current I_o	
Output resistance R_a	
Polarity reversal protected/transposition protected/short-circuit protected	
Ambient temperature T_a	
Switching frequency f max.	
Output function/power-on indicator	
Degree of protection as per IEC 60529	
Approvals	
Material	Housing
	Sensing surface
Connection	
Pulse stretching	

- Easy installation (since they can be mounted side-by-side and universally installed and can be stacked with a spacing of > 20 mm)
- Very reliable (due to inductive sensor principle)
- Optimal for detecting small parts (with integrated pulse extension, permanently set)

Applications

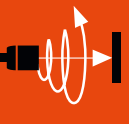
- Detection of nails, screws, welded studs, rivets, etc.
- Eject monitoring
- Part counting
- Checking for wire breaks
- Nail machines for creating pallets
- Feed check in assembly technology
- Blockage warning in feed hoses

Wiring diagrams, see page 958.



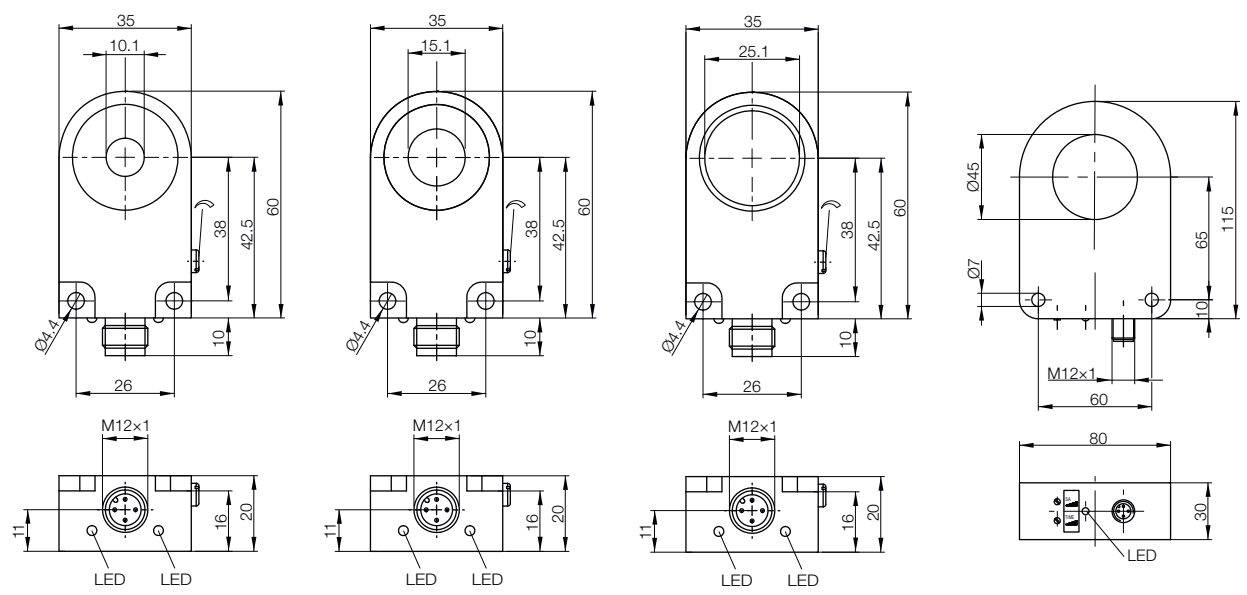
Inductive Sensors with Special Properties

Ring sensors, 35×60×20 mm, 115×80×30 mm



35×60×20 mm	35×60×20 mm	35×60×20 mm	115×80×30 mm
Not flush	Not flush	Not flush	Not flush
Ø 10.1 mm	Ø 15.1 mm	Ø 25.1 mm	Ø 45 mm
Ø 2 mm	Ø 3 mm	Ø 4 mm	Ø 9 mm
60 m/s	60 m/s	60 m/s	20 m/s
BES03JA	BES03JC	BES03JH	BES02TY
BES IKVS-010.23-G-S4	BES IKVS-015.23-G-S4	BES IKVS-025.23-G-S4	BES IKV-045.23-G-Z-S4
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
≤ 2 V	≤ 2 V	≤ 2 V	≤ 2 V
75 V DC	75 V DC	75 V DC	75 V DC
400 mA	400 mA	400 mA	200 mA
Open collector	Open collector	Open collector	Open collector
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
16 Hz	16 Hz	16 Hz	16 Hz
Green LED/Yellow LED	Green LED/Yellow LED	Green LED/Yellow LED	Green LED/Yellow LED
IP 65	IP 65	IP 65	IP 65
CE	CE	CE	CE
PBT	PBT	PBT	PBT
PVC	PVC	PVC	PBT
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin
60 ms	60 ms	60 ms	Can be set between 2.5...250 ms

- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- High-pressure Resistant Sensors
- Ex Sensors
- Steelface Sensors
- High Temperature Rated Sensors
- Full PTFE Sensor
- Sensors for the Food Industry
- Factor 1 Sensors
- Weld and Magnetic Field Immune Sensors
- Diagnostics Sensors
- Large Designs
- Ring Sensors
- Hose Sensors
- Analog Distance Measurement
- Accessories



Inductive Sensors with Special Properties

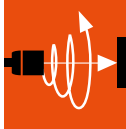
Hose sensors, 17x78.5x11.9 mm

Hose Sensors

Inductive tube sensors BES extend our line of ring sensors. Optimized for tube infeeds in automated assembly, they detect small parts easily and reliably.

- Simple attachment to the infeed tube
- Pulse extension of 150 ms results in a reliable detection of fast-moving parts.
- Object speed max. 20 m/s





Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

AC 2-wire

Special Properties

High-pressure Resistant Sensors

Ex Sensors

Steelface Sensors

High Temperature Rated Sensors

Full PTFE Sensor

Sensors for the Food Industry

Factor 1 Sensors

Weld and Magnetic Field Immune Sensors

Diagnostics Sensors

Large Designs

Ring Sensors

Hose Sensors

Analog Distance Measurement

Accessories

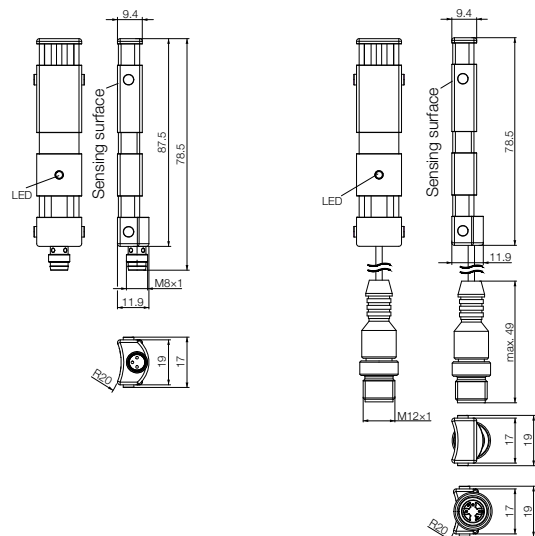
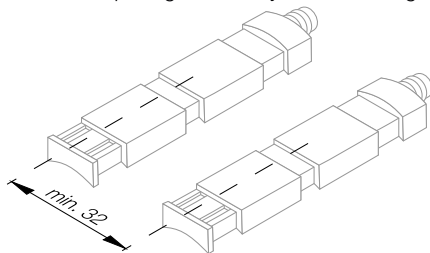
Size		17×78.5×11.9 mm	17×78.5×11.9 mm
Installation type (pay attention to the note in the Basic Information chapter)		Not flush	Not flush
Minimum object size		Screw M3×5	Screw M3×5
Rated switching distance s_n		16 mm	16 mm
Assured switching distance s_a		12.8 mm	12.8 mm
Switching distance marking		■	■
PNP, NO	Ordering code	BES0428	BES0429
	Part number	BES Z06K-PSC16F-S49G	BES Z06K-PSC16F-BP00,1-GS04
Supply voltage U_S		10...30 V DC	10...30 V DC
Voltage drop U_d at I_o max.		2.5 V	2.5 V
Rated insulation voltage U_i		75 V DC	75 V DC
Rated operating current I_o		200 mA	200 mA
Output resistance R_a		Open collector	Open collector
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		-25...+70 °C	-25...+70 °C
Switching frequency f max.		10 Hz	10 Hz
Output function indicator		Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67
Approvals		CE	CE
Material	Housing	PA 6.6	PA 6.6
	Sensing surface	UN 3082	UN 3082
Connection		M8 connector, 3-pin	0.1 m PUR cable with M12 connector, 3-pin
Pulse stretching		150 ms	150 ms

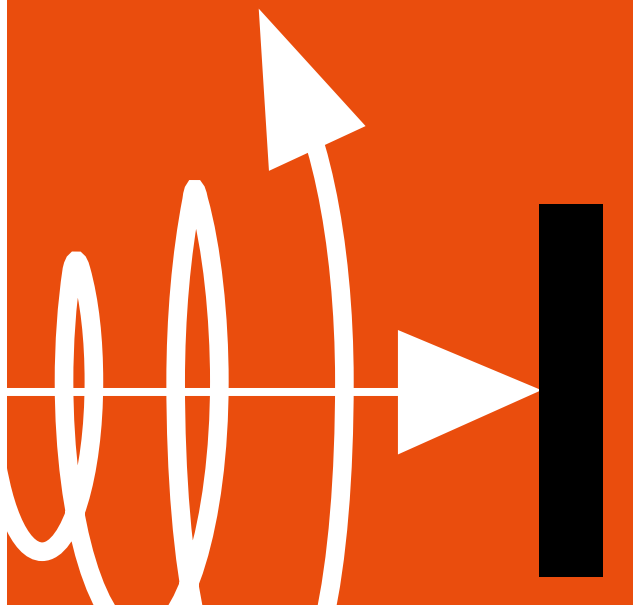
Wiring diagrams, see page 958.

The meaning of switching distance markings can be found on page 962.

Rated switching distance s_n relative to steel plate FE360 (18×18×1 mm)

Centerline spacing for side-by-side mounting





Inductive Sensors

Inductive sensors for analog distance measurement

Balluff inductive distance sensors BAW provide an absolute voltage- or current signal that changes proportionally to the distance of a metallic target. Objects of varying shape and size made of ferrous or non-ferrous materials damp the sensor to different degrees. This provides a simple way of detecting positions, distances and material differences.

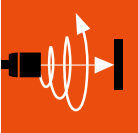


Cylinder Designs

Ø 6.5	698
M8×1	698
M12×1	699
M18×1	703
M30×1.5	706
M12x1 high-pressure resistant	708

Block Designs

10×30×6 mm (R03)	709
20×30×8 mm (R06)	710
14×38.5×17 mm (Z05)	711
80×80×40 mm	712
80×45×20 mm	713



Basic information
and definitions
can be found
on **page 934**.



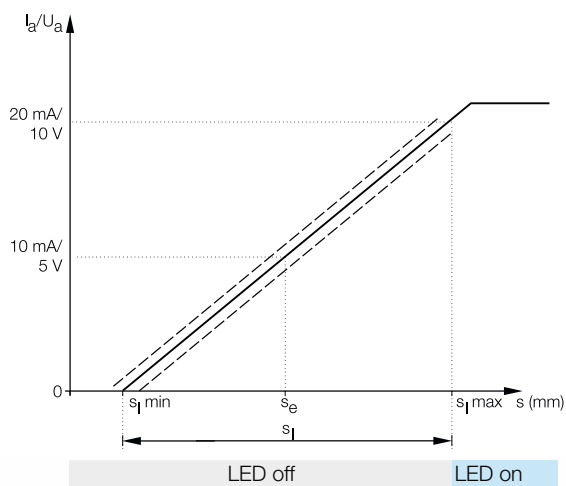
Inductive Sensors for Analog Distance Measurement

Features, output curve, evaluating programmed switching points

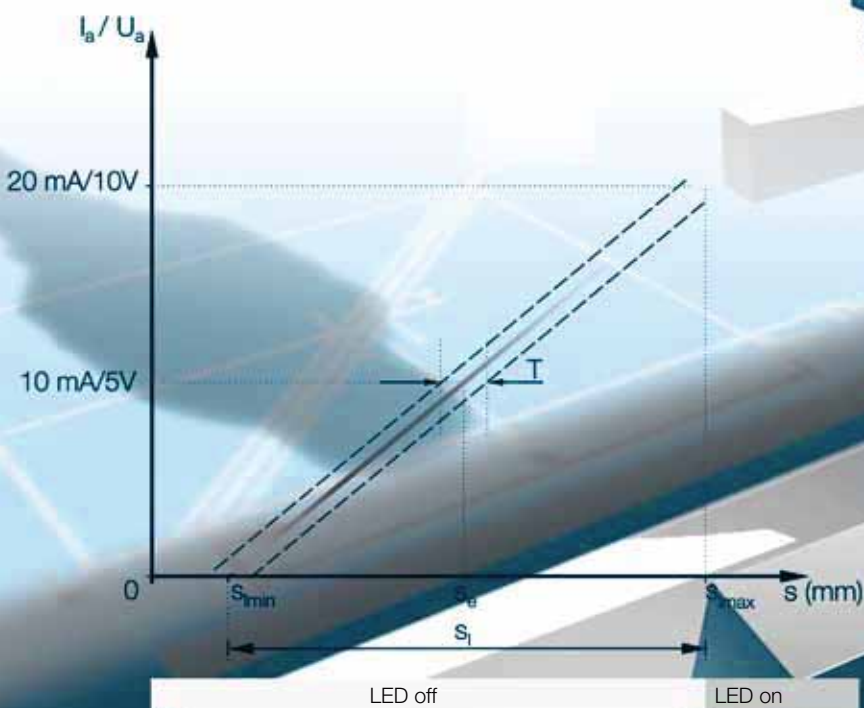
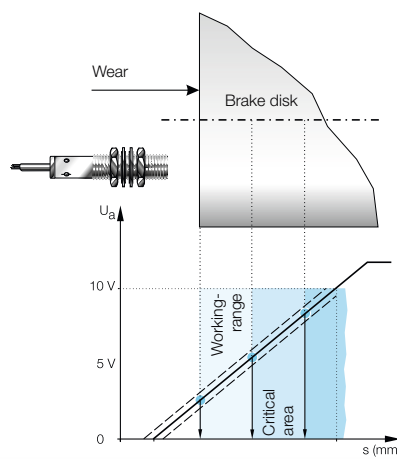
Features

- Distance-proportional analog output signal
- Contactless, absolute measuring principle
- Variety of form factors: cylindrical and cubical
- Measuring ranges from 0.5...50 mm
- High repeat accuracy
- Optimal linearity
- Low temperature drift
- Measuring speed up to 40 m/s
- LED for restricting the working range
- Insensitive to contamination

Output characteristics



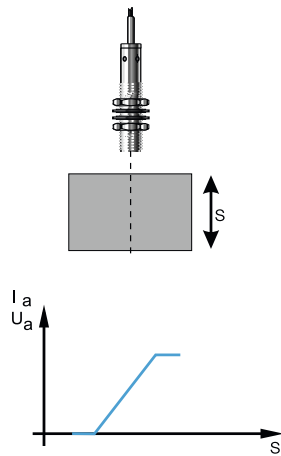
Evaluating programmed switching points (brake disk example)



Applications

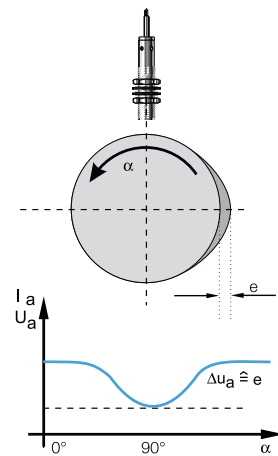
- Some examples from a wide range of industrial applications:
- Distance sensing (even at high travel speeds)
 - Measurement of film and sheet thicknesses
 - Belt center measurement
 - Measurement of metal strip widths
 - Detection of surface waves
 - Counting tasks
 - Positioning
 - Position checking
 - Clamping distance monitoring
 - Selection of different sizes and materials

Axial approach



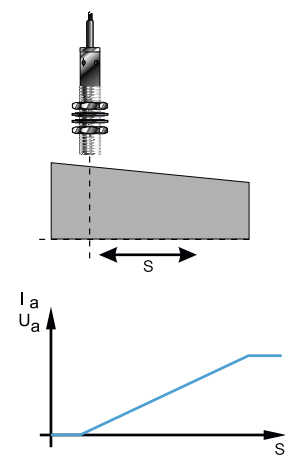
Distance changes in the sensor axis result in output signals proportional to distance.

Sensing a rotating object



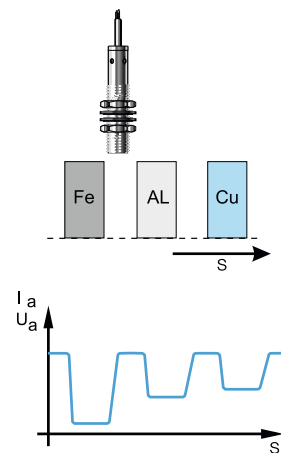
Eccentrics, cams or unbalanced motion result in a periodic change in the output signal.

Lateral approach



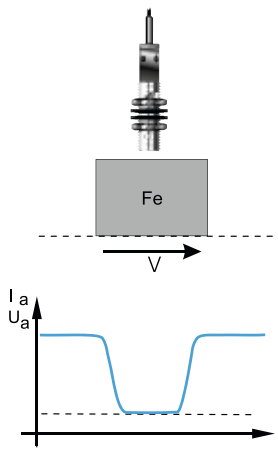
Detecting longer distances by sensing an inclined plane.

Sensing various materials



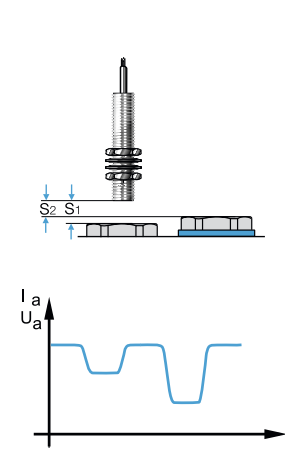
When the distance is kept constant, the output signal changes only when the object material is different.

Distance measurements at high object travel speeds



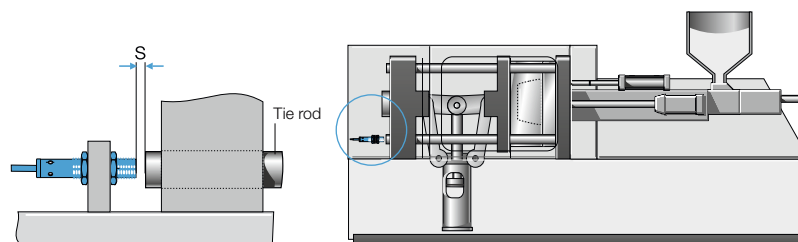
Even at high traverse speeds distances can be precisely measured.

Detecting installed seal rings

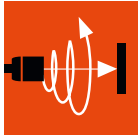


The seal ring effectively reduces the distance between the nut/screw and the sensor, thereby changing the output signal.

Tie rod length change on an injection molding machine



In injection molding machines, the clamping force of the tool is built up through a toggle joint and a hydraulic cylinder. The extension of the machine tie rods is thereby directly proportional to the clamping force, and can be easily determined using an inductive distance sensor.



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

AC 2-wire

Special Properties

Analog Distance Measurement

Cylinder Designs

Block Designs

Accessories

Inductive Sensors for Analog Distance Measurement

Cylinder designs, Ø 6.5 mm, M8x1



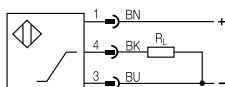
Temperature output

Model	Ø 6.5 mm	Ø 6.5 mm	M8x1
Installation type (observe instructions in the Basic Information chapter)	Flush	Flush	Flush
Output signal	Voltage, 0...10 V	Voltage, 0...10 V	Voltage, 0...10 V
Linear range s_L	0.5...2 mm	0.5...2 mm	0.5...1.5 mm
Ordering code	BAW000L	BAW000J	BAW000N
Part number	BAW G06EF-UAC20B-S49G	BAW G06EE-UAF20B-EP03-K	BAW M08EI-UAD15B-BP00,2-GS04
Supply voltage U_S	15...30 V DC	21.6...26.4 V DC	15...30 V DC
Rated insulation voltage U_I (protection class)	75 V DC	75 V DC	250 V AC (II)
Effective distance s_e	1.25 mm	1.25 mm	1 mm
Load resistance R_L min.	2 k Ω	5 k Ω	2 k Ω
Load resistance R_L max.			
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	No/No/No	Yes/Yes/Yes
Adjustment display (LED)	Yes	No	No
Ambient temperature T_a	+10...+60°C*	+10...+60°C*	-10...+70 °C
Repeat accuracy R_{BWN}	$\pm 40.0 \mu\text{m}$	$\pm 10.0 \mu\text{m}$	$\pm 8.0 \mu\text{m}$
Non-linearity max.	$\pm 45 \mu\text{m}$	$\pm 45 \mu\text{m}$	$\pm 30 \mu\text{m}$
Limit frequency (-3 dB)	1 kHz	1 kHz	1 kHz
Response time	0.5 ms	1 ms	0.5 ms
Temperature coefficient, typically in range from +10...+50 °C	-0.6 $\mu\text{m}/\text{K}$	-1 $\mu\text{m}/\text{K}$	-1 $\mu\text{m}/\text{K}$
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67
Approvals	CE, cULus	CE	CE, cULus
Material			
Housing	Stainless steel	Stainless steel	Stainless steel
Sensing surface	PBT	PBT	PBT
Connection	M8 connector, 3-pin	3 m PUR cable, 4x0.14 mm ²	0.2 m PUR cable with M12 connector, 3-pin

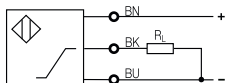
* The function is also ensured over a range of -10...+70 °C

Wiring diagrams

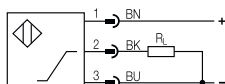
Connector, voltage output



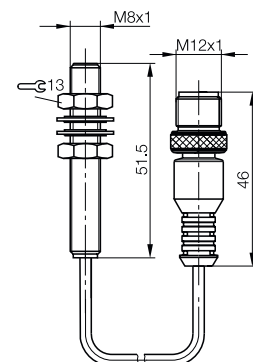
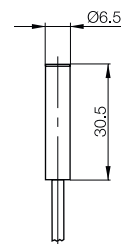
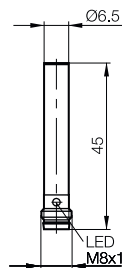
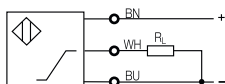
Cable, voltage output



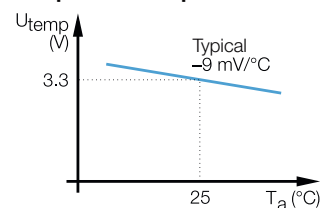
Connector, current output



Cable, current output



Temperature output



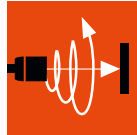
The temperature output (not short-circuit protected) provides a signal representing a precisely measured temperature change.

Inductive Sensors for Analog Distance Measurement

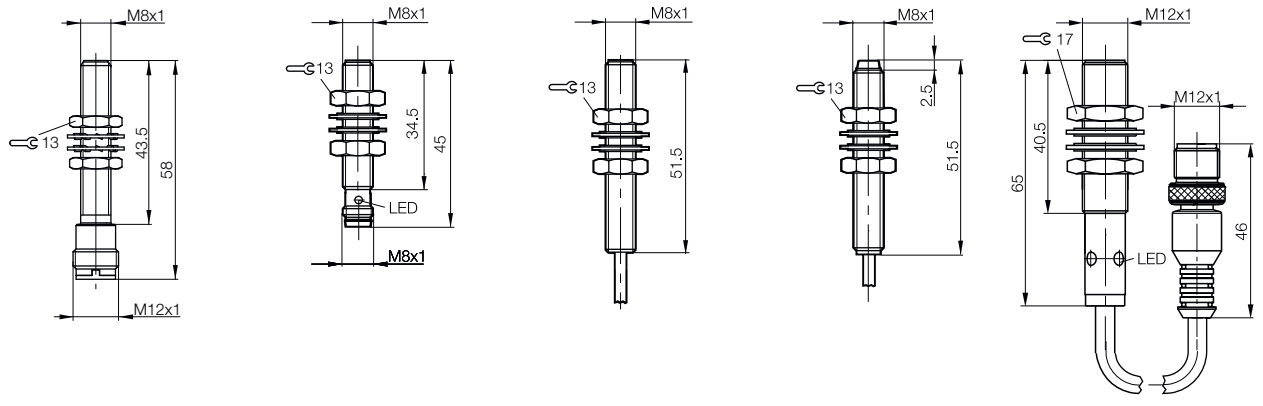
Cylinder designs, M8x1, M12x1



M8x1	M8x1	M8x1	M8x1	M12x1
Flush	Flush	Flush	Not flush	Flush
Voltage, 0...10 V	Voltage, 0...10 V	Voltage, 0...10 V	Voltage, 0...10 V	Current, 4...20 mA
0.5...1.5 mm	0.5...1.5 mm	0.5...1.5 mm	0.5...2.5 mm	0.5...2 mm
BAW003R	BAW000M	BAW000T	BAW000W	BAW001F
BAW M08EH-UAD15B-S04G	BAW M08EF-UAC15B-S49G	BAW M08EI-UAD15B-BP03	BAW M08EI-UAD25F-BP03	BAW M12MG2-ICC20B-BP00,2-GS04
15...30 V DC	15...30 V DC	15...30 V DC	15...30 V DC	10...30 V DC
250 V AC	250 V AC (□)	250 V AC (□)	250 V AC (□)	250 V AC (□)
1 mm	1 mm	1 mm	1.5 mm	1.25 mm
2 kΩ	2 kΩ	2 kΩ	2 kΩ	500 Ω
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
No	Yes	No	No	Yes
-10...+70 °C	-10...+70 °C	-10...+70 °C	-10...+60 °C*	-10...+70 °C
±40.0 μm	±40.0 μm	±8.0 μm	±10.0 μm	±5.0 μm
±30 μm	±30 μm	±30 μm	±60 μm	±45 μm
1 kHz	1 kHz	1 kHz	1 kHz	500 Hz
0.5 ms	0.5 ms	0.5 ms	1 ms	0.5 ms
0 μm/K	0 μm/K	-1 μm/K	-1.5 μm/K	-0.5 μm/K
IP 67	IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Brass, coated
PBT	PBT	PBT	PBT	PBT
M12 connector, 3-pin	M8 connector, 3-pin	3 m PUR cable, 3x0.14 mm ²	3 m PUR cable, 3x0.14 mm ²	0.2 m PUR cable with M12 connector, 3-pin



- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- Analog Distance Measurement
- Cylinder Designs
- Block Designs
- Accessories



Inductive Sensors for Analog Distance Measurement

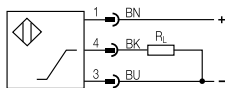
Cylinder designs, M12x1



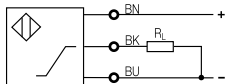
Model	M12x1	M12x1	M12x1
Installation type (observe instructions in the Basic Information chapter)	Flush	Flush	Flush
Output signal	Current, 4...20 mA	Voltage, 0...10 V	Voltage, 0...10 V
Linear range s_l	0.5...2 mm	0.5...2 mm	0.5...2 mm
Ordering code	BAW001H	BAW001J	BAW001P
Part number	BAW M12MG2-ICC20B-BP03	BAW M12MG2-UAC20B-BP00,2-GS04	BAW M12MI-UAC20B-S04G
Supply voltage U_s	10...30 V DC	15...30 V DC	15...30 V DC
Rated insulation voltage U_i (protection class)	250 V AC (II)	250 V AC (II)	250 V AC (II)
Effective distance s_e	1.25 mm	1.25 mm	1.3 mm
Load resistance R_L min.		2 k Ω	2 k Ω
Load resistance R_L max.	500 Ω		
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Adjustment display (LED)	Yes	Yes	Yes
Ambient temperature T_a	-10...+70 °C	-10...+70 °C	-10...+70 °C
Repeat accuracy R_{BWN}	± 6.0 μm	± 8.0 μm	± 8.0 μm
Non-linearity max.	± 45 μm	± 45 μm	± 45 μm
Limit frequency (-3 dB)	500 Hz	500 Hz	500 Hz
Response time	0.5 ms	0.5 ms	0.5 ms
Temperature coefficient, typically in range from +10...+50 °C	-0.5 $\mu\text{m}/\text{K}$	-1 $\mu\text{m}/\text{K}$	-0.5 $\mu\text{m}/\text{K}$
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67
Approvals	CE, cULus	CE, cULus	CE, cULus
Material			
Housing	Brass, coated	Brass, coated	Brass, coated
Sensing surface	PBT	PBT	PBT
Connection	3 m PUR cable, 3x0.34 mm ²	0.2 m PUR cable with M12 connector, 3-pin	M12 connector, 3-pin

Wiring diagrams

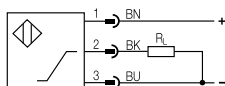
Connector, voltage output



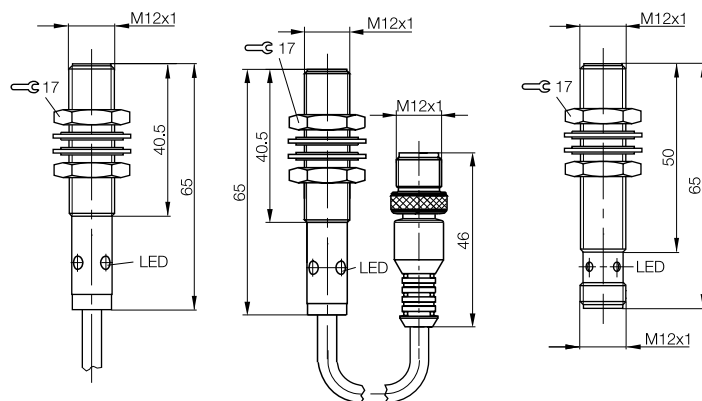
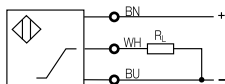
Cable, voltage output



Connector, current output



Cable, current output

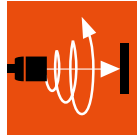


Inductive Sensors for Analog Distance Measurement

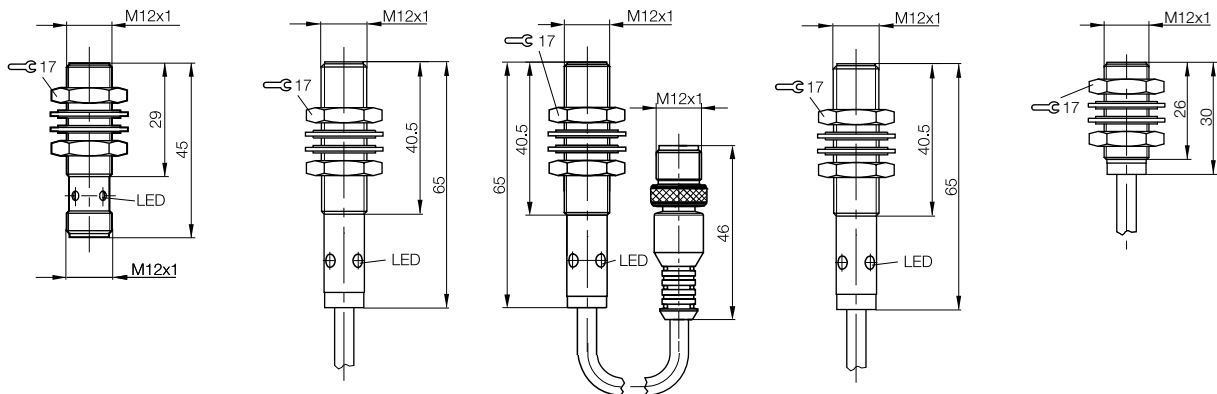
Cylinder designs, M12x1



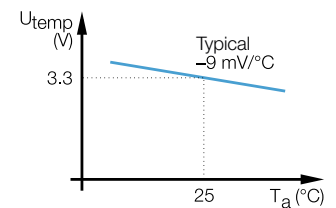
					Temperature output
M12x1	M12x1	M12x1	M12x1	M12x1	M12x1
Flush	Flush	Flush	Flush	Flush	Quasi-flush
Voltage, 0...10 V	Voltage, 0...10 V	Current, 0...20 mA	Current, 0...20 mA	Current, 0...20 mA	Voltage, 0...10 V
0.5...2 mm	0.5...2 mm	0.5...2 mm	0.5...2 mm	0.5...2 mm	1...5 mm
BAW0010	BAW001L	BAW0019	BAW001C	BAW001C	BAW0011
BAW M12ME-UAC20B-S04G	BAW M12MG2-UAC20B-BP03	BAW M12MG2-IAC20B-BP00,2-GS04	BAW M12MG2-IAC20B-BP03	BAW M12MG2-IAC20B-BP03	BAW M12ME-UAD50B-BP01
15...30 V DC	15...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	15...30 V DC
250 V AC (⊠)	250 V AC (⊠)	250 V AC (⊠)	250 V AC (⊠)	250 V AC (⊠)	75 V DC
1.25 mm	1.25 mm	1.25 mm	1.25 mm	1.25 mm	3 mm
2 kΩ	2 kΩ	500 Ω	500 Ω	500 Ω	2 kΩ
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Yes	Yes	Yes	Yes	Yes	No
-10...+70 °C	-10...+70 °C	-10...+70 °C	-10...+70 °C	-10...+70 °C	0...+60 °C
±20.0 μm	±8.0 μm	±5.0 μm	±5.0 μm	±5.0 μm	±10.0 μm
±45 μm	±45 μm	±45 μm	±45 μm	±45 μm	±160 μm
500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	1 kHz
0.5 ms	0.5 ms	0.5 ms	0.5 ms	0.5 ms	2 ms
0 μm/K	-1 μm/K	-1 μm/K	-1 μm/K	-1 μm/K	-1.5 μm/K
IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Brass, coated	Brass, coated	Brass, coated	Brass, coated	Brass, coated	Brass, coated
PBT	PBT	PBT	PBT	PBT	PA 12
M12 connector, 3-pin	3 m PUR cable, 3x0.34 mm ²	0.2 m PUR cable with M12 connector, 3-pin	3 m PUR cable, 3x0.34 mm ²	3 m PUR cable, 3x0.34 mm ²	1 m PUR cable, 4x0.25 mm ²



- Inductive Sensors
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- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- Analog Distance Measurement
- Cylinder Designs
- Block Designs
- Accessories



Temperature output



The temperature output (not short-circuit protected) provides a signal representing a precisely measured temperature change.

Inductive Sensors for Analog Distance Measurement

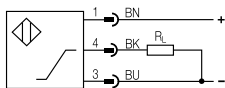
Cylinder designs, M12x1



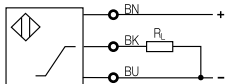
Model	M12x1	M12x1	M12x1
Installation type (observe instructions in the Basic Information chapter)	Not flush	Not flush	Not flush
Output signal	Voltage, 0...10 V	Voltage, 0...10 V	Voltage, 0...10 V
Linear range s_l	1...4 mm	1...4 mm	1...4 mm
Ordering code	BAW0014	BAW000Z	BAW0017
Part number	BAW M12MF2-UAC40F-BP00,2-GS04	BAW M12MD-UAC40F-S04G	BAW M12MF2-UAC40F-BP03
Supply voltage U_s	15...30 V DC	15...30 V DC	15...30 V DC
Rated insulation voltage U_i (protection class)	250 V AC (II)	250 V AC (II)	250 V AC (II)
Effective distance s_e	2.5 mm		2.5 mm
Load resistance R_L min.	2 k Ω		2 k Ω
Load resistance R_L max.		2 k Ω	
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Adjustment display (LED)	Yes	Yes	Yes
Ambient temperature T_a	-10...+70 °C	-10...+70 °C	-10...+70 °C
Repeat accuracy R_{BWN}	$\pm 10.0 \mu\text{m}$	$\pm 10.0 \mu\text{m}$	$\pm 10.0 \mu\text{m}$
Non-linearity max.	$\pm 90 \mu\text{m}$	$\pm 90 \mu\text{m}$	$\pm 90 \mu\text{m}$
Limit frequency (-3 dB)	500 Hz	500 Hz	500 Hz
Response time	1 ms	1 ms	1 ms
Temperature coefficient, typically in range from +10...+50 °C	0 $\mu\text{m}/\text{K}$	-2 $\mu\text{m}/\text{K}$	0 $\mu\text{m}/\text{K}$
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67
Approvals	CE, cULus	CE, cULus	CE, cULus
Material			
Housing	Brass, coated	Brass, coated	Brass, coated
Sensing surface	PBT	PBT	PBT
Connection	0.2 m PUR cable with M12 connector, 3-pin	M12 connector, 3-pin	3 m PUR cable, 3x0.34 mm ²

Wiring diagrams

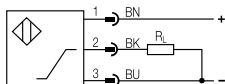
Connector, voltage output



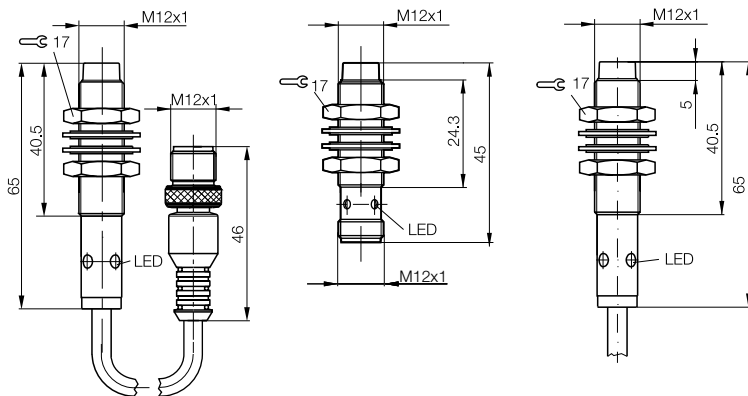
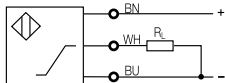
Cable, voltage output



Connector, current output



Cable, current output



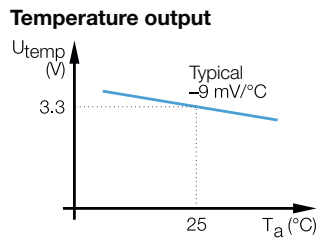
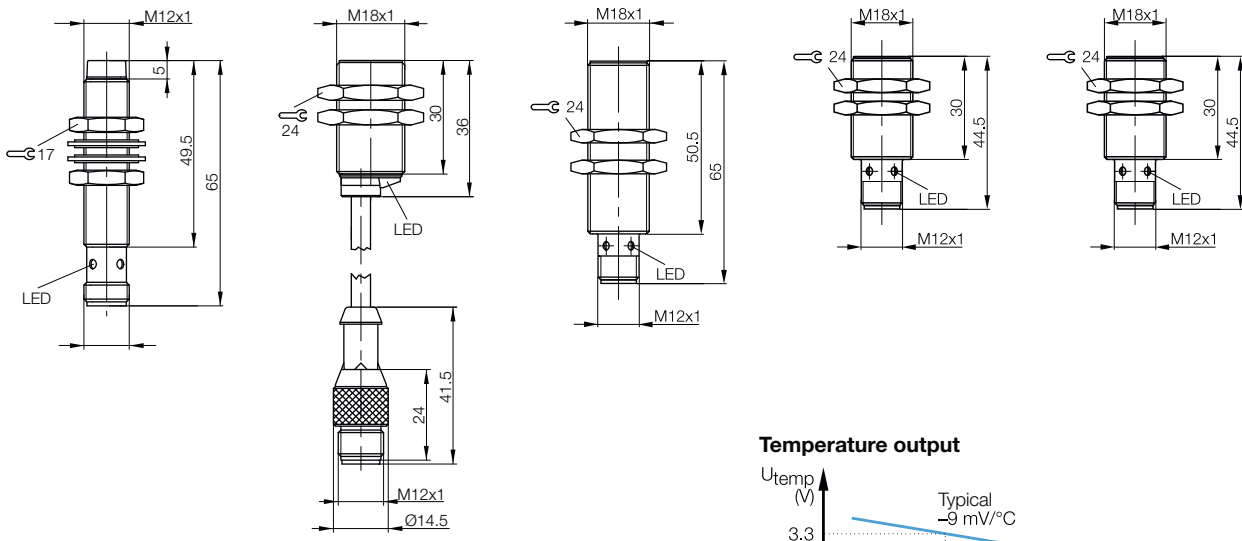
Inductive Sensors for Analog Distance Measurement

Cylinder designs, M12×1, M18×1



Temperature output				
M12×1	M18×1	M18×1	M18×1	M18×1
Not flush	Flush	Flush	Flush	Flush
Current, 4...20 mA	Voltage, 0...10 V	Voltage, 0...10 V	Voltage, 0...10 V	Voltage, 0...10 V
1...4 mm	1...5 mm	1...5 mm	1...5 mm	1...5 mm
BAW003N	BAW001Z	BAW002K	BAW0026	BAW0025
BAW M12MH1-ICC40F-S04G	BAW M18ME-UAC50B-BP00,2-GS04	BAW M18MI-UAC50B-S04G	BAW M18ME-UAE50B-S04G-K	BAW M18ME-UAC50B-S04G
10...30 V DC	15...30 V DC	15...30 V DC	21.6...26.4 V DC	15...30 V DC
250 V AC (⊠)	75 V DC	250 V AC (⊠)	75 V DC	75 V DC
2.5 mm	2 kΩ	3 mm	3 mm	3 mm
500 Ω		2 kΩ	2 kΩ	2 kΩ
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Yes	Yes	Yes	Yes	Yes
-10...+70 °C	-10...+70 °C	-10...+70 °C	-10...+70 °C	-10...+70 °C
±120 μm	±8.0 μm	±8.0 μm	±8.0 μm	±8.0 μm
500 Hz	±120 μm	±120 μm	±120 μm	±120 μm
0.5 ms	500 Hz	500 Hz	500 Hz	500 Hz
	1 ms	1 ms	1 ms	1 ms
	-1 μm/K	-2 μm/K	-1 μm/K	-2 μm/K
IP 67	IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Brass, coated	Brass, coated	Brass, coated	Brass, coated	Brass, coated
PBT	PBT	PBT	PBT	PBT
M12 connector, 3-pin	0.2 m PUR cable with M12 connector, 3-pin	M12 connector, 3-pin	M12 connector, 4-pin	M12 connector, 3-pin

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The temperature output (not short-circuit protected) provides a signal representing a precisely measured temperature change.

Inductive Sensors for Analog Distance Measurement

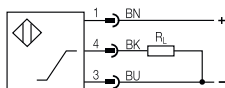
Cylinder designs, M18x1



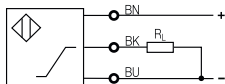
Model	M18x1	M18x1	M18x1
Installation type (observe instructions in the Basic Information chapter)	Flush	Flush	Flush
Output signal	Voltage, 0...10 V	Voltage, 0...10 V	Voltage, 0...10 V
Linear range s_l	1...5 mm	1...5 mm	1...5 mm
Ordering code	BAW002M	BAW002U	BAW0022
Part number	BAW M18M12-UAC50B-BP05-002	BAW M18MM-UAZ50B-BP05-505	BAW M18ME-UAC50B-BP03
Supply voltage U_s	15...30 V DC	21.6...26.4 V DC	15...30 V DC
Rated insulation voltage U_i (protection class)	250 V AC (II)	250 V AC (II)	75 V DC
Effective distance s_e	3 mm	3 mm	3 mm
Load resistance R_L min.	2 k Ω	2 k Ω	2 k Ω
Load resistance R_L max.			
Polarity reversal protected/transposition protected/short-circuit protected	Yes/No/Yes	Yes/No/Yes	Yes/Yes/Yes
Adjustment display (LED)	Yes	No	Yes
Ambient temperature T_a	-10...+70 °C	-10...+70 °C	-10...+70 °C
Repeat accuracy R_{BWN}	$\pm 8.0 \mu\text{m}$	$\pm 8.0 \mu\text{m}$	$\pm 8.0 \mu\text{m}$
Non-linearity max.	$\pm 120 \mu\text{m}$	$\pm 120 \mu\text{m}$	$\pm 120 \mu\text{m}$
Limit frequency (-3 dB)	500 Hz	500 Hz	500 Hz
Response time	1 ms	1 ms	1 ms
Temperature coefficient, typically in range from +10...+50 °C	-1.5 $\mu\text{m}/\text{K}$	0 $\mu\text{m}/\text{K}$	-1 $\mu\text{m}/\text{K}$
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67
Approvals	CE, cULus	CE, cULus	CE, cULus
Material			
Housing	Brass, coated	Brass, coated	Brass, coated
Sensing surface	PBT	PBT	PBT
Connection	5 m PUR cable, 7x0.25 mm ²	5 m PUR cable, 7x0.25 mm ²	3 m PUR cable, 3x0.34 mm ²

Wiring diagrams

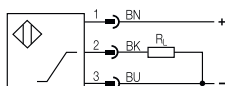
Connector, voltage output



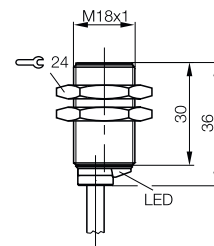
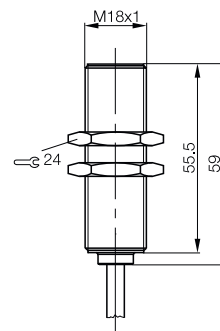
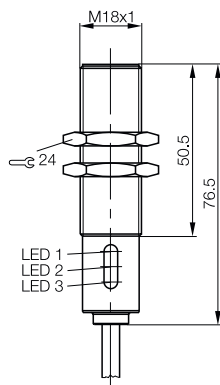
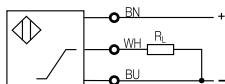
Cable, voltage output



Connector, current output



Cable, current output



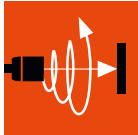
Inductive Sensors for Analog Distance Measurement

Cylinder designs, M18x1

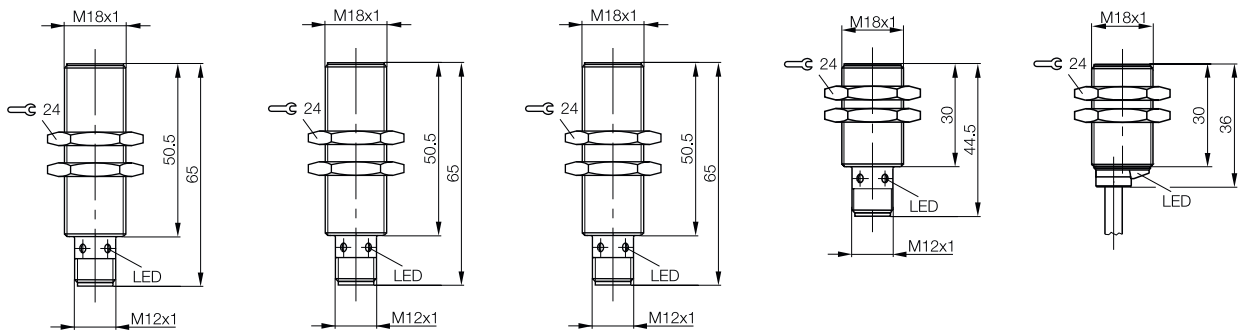


IO-Link

M18x1	M18x1	M18x1	M18x1	M18x1
Flush	Flush	Flush	Flush	Flush
IO-Link, falling with rising proximity	Current, 0...20 mA	Current, 4...20 mA	Current, 4...20 mA	Current, 4...20 mA
1...5 mm	1...5 mm	1...5 mm	1...5 mm	1...5 mm
BAW002F	BAW002H	BAW002J	BAW001U	BAW001T
BAW M18MI-BLC50B-S04G	BAW M18MI-IAC50B-S04G	BAW M18MI-ICC50B-S04G	BAW M18ME-ICC50B-S04G	BAW M18ME-ICC50B-BP03
18...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	15...30 V DC
250 V AC (□)	250 V AC (□)	250 V AC (□)	75 V DC	75 V DC
3 mm	3 mm	3 mm	3 mm	3 mm
	500 Ω	500 Ω	500 Ω	500 Ω
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Yes	Yes	Yes	Yes	Yes
-10...+70 °C	-10...+70 °C	-10...+70 °C	-10...+70 °C	-10...+70 °C
±10.0 μm	±8.0 μm	±8.0 μm	±8.0 μm	±8.0 μm
±120 μm	±120 μm	±120 μm	±120 μm	±120 μm
500 Hz	500 Hz	500 Hz	500 Hz	500 Hz
2 ms	1 ms	1 ms	1 ms	1 ms
-2 μm/K	-1 μm/K	-5 μm/K	-3 μm/K	-3 μm/K
IP 67	IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Brass, coated	Brass, coated	Brass, coated	Brass, coated	Brass, coated
PBT	PBT	PBT	PBT	PBT
M12 connector, 3-pin	M12 connector, 3-pin	M12 connector, 3-pin	M12 connector, 3-pin	3 m PVC cable, 3x0.34 mm ²



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- AC 2-wire
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Inductive Sensors for Analog Distance Measurement

Cylinder designs, M18x1, M30x1.5



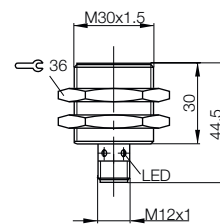
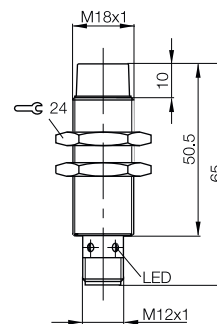
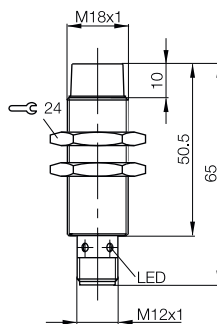
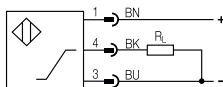
Temperature output

	M18x1	M18x1	M30x1.5
Model	M18x1	M18x1	M30x1.5
Installation type (observe instructions in the Basic Information chapter)	Not flush	Not flush	Flush
Output signal	Voltage, 0...10 V	Voltage, 0...10 V	Voltage, 0...10 V
Linear range s_L	2...8 mm	4...16 mm	2...10 mm
Ordering code	BAW002C	BAW0029	BAW002W
Part number	BAW M18MG-UAC80F-S04G	BAW M18MG-UAC16F-S04G-K	BAW M30ME-UAC10B-S04G
Supply voltage U_S	15...30 V DC	15...30 V DC	15...30 V DC
Rated insulation voltage U_i (protection class)	250 V AC (II)	250 V AC (II)	250 V AC (II)
Effective distance s_e	5 mm	10 mm	6 mm
Load resistance R_L min.	2 k Ω	2 k Ω	2 k Ω
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Adjustment display (LED)	Yes	Yes	Yes
Ambient temperature T_a	-10...+70 °C	+10...+60°C*	-10...+70 °C
Repeat accuracy R_{BWN}	$\pm 12.0 \mu\text{m}$	$\pm 200.0 \mu\text{m}$	$\pm 10.0 \mu\text{m}$
Non-linearity max.	$\pm 180 \mu\text{m}$	$\pm 360 \mu\text{m}$	$\pm 240 \mu\text{m}$
Limit frequency (-3 dB)	500 Hz	500 Hz	500 Hz
Response time	1.5 ms	3 ms	1.5 ms
Temperature coefficient, typically in range from +10...+50 °C	-3 $\mu\text{m}/\text{K}$	8 $\mu\text{m}/\text{K}$	1.5 $\mu\text{m}/\text{K}$
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67 per BWN Pr. 14
Approvals	CE, cULus	CE, cULus	CE, cULus
Material	Housing: Brass, coated Sensing surface: PBT	Brass, coated PBT	Brass, coated PBT
Connection	M12 connector, 3-pin	M12 connector, 3-pin	M12 connector, 3-pin

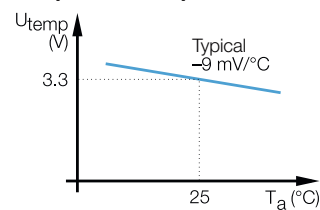
* The function is also ensured over a range of -10...+70 °C

Wiring diagram

Connector, voltage output



Temperature output

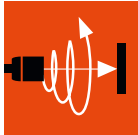


The temperature output (not short-circuit protected) provides a signal representing a precisely measured temperature change.

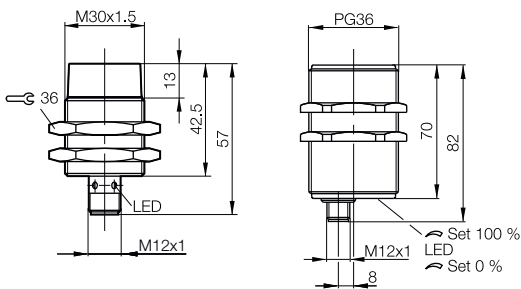
Inductive Sensors for
Analog Distance Measurement
Cylinder designs, M30×1.5, PG36



M30×1.5	PG36			
Not flush	Flush			
Voltage, 0...10 V	Voltage, 0...10 V			
3...15 mm	0...20 mm			
BAW002Y	BAW003M			
BAW M30ME-UAC15F-S04G	BAW MKZ-471.19-S4			
15...30 V DC	20...30 V DC			
250 V AC (□)	75 V DC			
9 mm	10 mm			
2 kΩ	10 kΩ			
Yes/Yes/Yes	Yes/Yes/Yes			
Yes	Yes			
-10...+70 °C	-10...+70 °C			
±12.0 μm	±5.0 μm			
±360 μm	±600 μm			
350 Hz	20 Hz			
3 ms				
1.5 μm/K	-1 μm/K			
IP 67	IP 67			
CE, cULus	CE			
Brass, coated	Brass, coated			
PBT	PBT			
M12 connector, 3-pin	M12 connector, 3-pin			



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Inductive Sensors for Analog Distance Measurement

Cylinder design, high-pressure resistant M12×1

- Analog for control of valves or soft stop
- Measurements of valves and cylinders possible
- Ceramic on medium side – robust
- Oil pressure up to 500 bar

Application areas

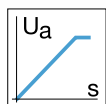
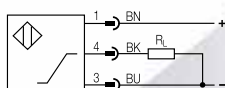
- Control of valves
- Parked position of cranes
- Final position of installation supports
- Service measurements of valves
- Position monitoring in mobile hydraulic systems
- Control of agricultural technology



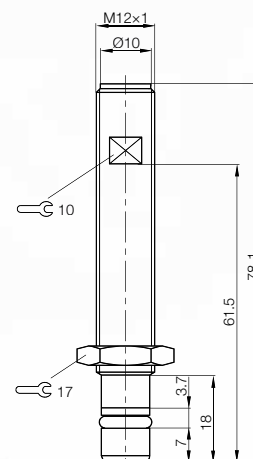
Model	M12×1
Installation type (observe instructions in the Basic Information chapter)	Flush
Output signal	Voltage, 0...10 V
Linear range s_l	0.5...2 mm
Ordering code	BAW0040
Part number	BAW Z08EO-UAD20B-S04G-H11
Supply voltage U_S	15...30 V DC
Rated insulation voltage U_i (protection class)	75 V DC
Effective distance s_e	1.25 mm
Load resistance R_L min.	2 kΩ
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes
Adjustment display (LED)	No
Ambient temperature T_a	-25...+85 °C
Repeat accuracy R_{BWN}	±8.0 μm
Non-linearity max.	±45 μm
Limit frequency (-3 dB)	1 kHz
Response time	1 ms
Temperature coefficient, typically in range from +10...+50 °C	-1 μm/K
Degree of protection as per IEC 60529	IP 68
Approvals	CE, cULus
Material	Housing: Stainless steel Sensing surface: Ceramic
Connection	M12 connector, 3-pin

Wiring diagram

Connector, voltage output

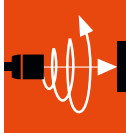


500 bar



Inductive Sensors for Analog Distance Measurement

Block design, 10×30×6 mm

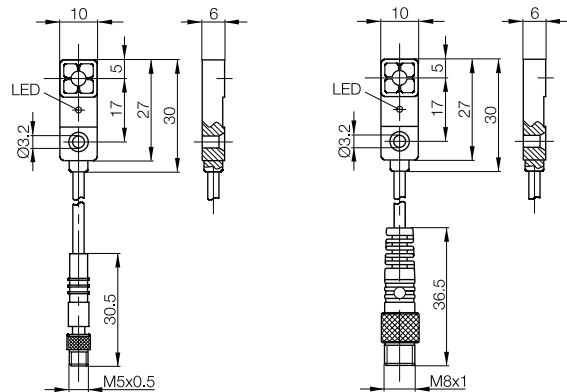
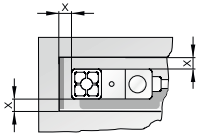


Inductive Sensors
Global DC 3-wire
DC 3-/4-wire
DC 2-wire
AC/DC 2-wire
AC 2-wire
Special Properties
Analog Distance Measurement
Cylinder Designs
Block Designs
Accessories

	10×30×6 mm R03	10×30×6 mm R03
Model	10×30×6 mm R03	10×30×6 mm R03
Installation type (observe instructions in the Basic Information chapter)	Flush	Flush
Output signal	Voltage, 0...10 V	Voltage, 0...10 V
Linear range s_L	1...4 mm	1...4 mm
Ordering code	BAW0030	BAW0031
Part number	BAW R03KC-UAE40B-BP00,3-GS26	BAW R03KC-UAE40B-BP00,3-GS49
Supply voltage U_S	21.6...26.4 V DC	21.6...26.4 V DC
Rated insulation voltage U_i (protection class)	75 V DC	75 V DC
Effective distance s_e	2.5 mm	2.5 mm
Load resistance R_L min.	5 k Ω	5 k Ω
Polarity reversal protected/transposition protected/short-circuit protected	No/No/No	No/No/No
Adjustment display (LED)	Yes	Yes
Ambient temperature T_a	0...+70 °C	0...+70 °C
Repeat accuracy R_{BWN}	$\pm 35.0 \mu\text{m}$	$\pm 35.0 \mu\text{m}$
Non-linearity max.	$\pm 150 \mu\text{m}$	$\pm 150 \mu\text{m}$
Limit frequency (-3 dB)	1 kHz	1 kHz
Response time	0.5 ms	0.5 ms
Temperature coefficient, typically in range from +10...+50 °C	4.7 $\mu\text{m}/\text{K}$	4.7 $\mu\text{m}/\text{K}$
Degree of protection as per IEC 60529	IP 67	IP 67
Approvals	CE, cULus	CE, cULus
Material	Housing: PA6-FG30 Sensing surface: PA6-FG30	PA6-FG30 PA6-FG30
Connection	0.3 m PUR cable with M5 connector, 3-pin	0.3 m PUR cable with M8 connector, 3-pin

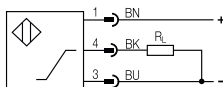
Installation note for BAW R03...

Material	Installation dimensions x
Steel	0 mm
Brass	5 mm
Aluminum	5 mm
Stainless steel	5 mm



Wiring diagram

Connector, voltage output



Inductive Sensors for Analog Distance Measurement

Block designs, 10×30×6 mm, 20×30×8 mm

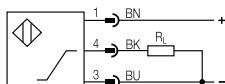


Model	10×30×6 mm R03	20×30×8 mm R06	
Installation type (observe instructions in the Basic Information chapter)	Flush	Flush	
Output signal	Voltage, 0...10 V	Voltage, 0...10 V	
Linear range s_l	1...4 mm	0.5...2 mm	
Ordering code	BAW0032	BAW0034	
Part number	BAW R03KC-UAE40B-BP03	BAW R06AC-UAF20B-S49G	
Supply voltage U_s	21.6...26.4 V DC	21.6...26.4 V DC	
Rated insulation voltage U_i (protection class)	75 V DC	75 V DC	
Effective distance s_e	2.5 mm	1.3 mm	
Load resistance R_L min.	5 k Ω	5 k Ω	
Polarity reversal protected/transposition protected/short-circuit protected	No/No/No	No/No/No	
Adjustment display (LED)	Yes	No	
Ambient temperature T_a	0...+70 °C	-10...+70 °C	
Repeat accuracy R_{BWN}	$\pm 35.0 \mu\text{m}$	$\pm 12.0 \mu\text{m}$	
Non-linearity max.	$\pm 150 \mu\text{m}$	$\pm 45 \mu\text{m}$	
Limit frequency (-3 dB)	1 kHz	1 kHz	
Response time	0.5 ms	0.5 ms	
Temperature coefficient, typically in range from +10...+50 °C	5 $\mu\text{m}/\text{K}$	0.5 $\mu\text{m}/\text{K}$	
Degree of protection as per IEC 60529	IP 67	IP 67	
Approvals	CE, cULus	CE	
Material	Housing PA6-FG30	Anodized aluminum	
	Sensing surface PA6-FG30	PBT	
Connection	3 m PUR cable, 3×0.14 mm ²	M8 connector, 3-pin	

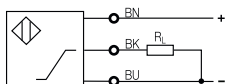
* The function is also ensured over a range of -10...+70 °C

Wiring diagrams

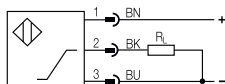
Connector, voltage output



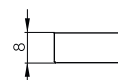
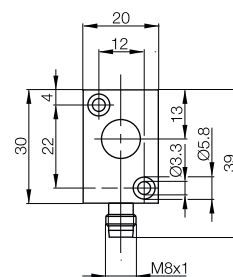
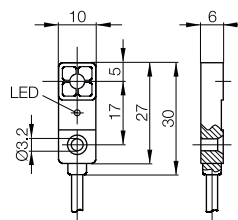
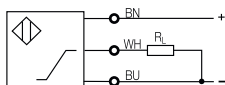
Cable, voltage output



Connector, current output



Cable, current output



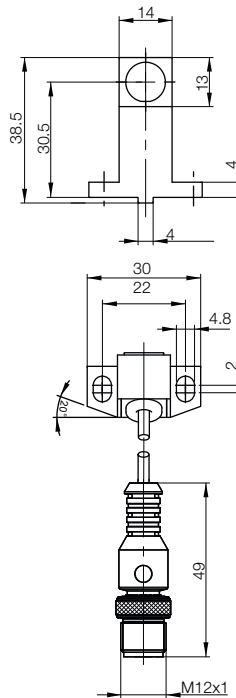
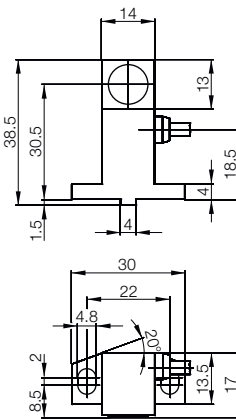
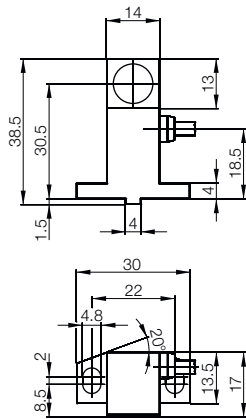
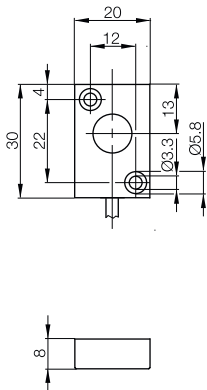
Inductive Sensors for Analog Distance Measurement

Block designs 20×30×8 mm, 14×38.5×17 mm

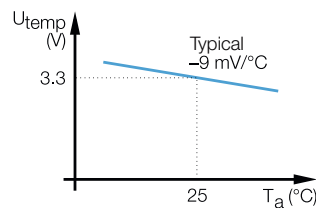


20×30×8 mm R06	14×38.5×17 mm Z01	14×38.5×17 mm Z01	14×38.5×17 mm Z05
Flush			
Voltage, 0...10 V	Voltage, 0...10 V	IO-Link, falling with rising proximity	IO-Link, falling with rising proximity
0.5...2 mm	1...5 mm	1...5 mm	1...5 mm
BAW0033	BAW003E	BAW003A	BAW003W
BAW R06AC-UAF20B-EP03	BAW Z01AC-UAD50B-DP03-K	BAW Z01AC-BLD50B-DP03	BAW Z05AC-BLD50B-BP00,75-GS04
21.6...26.4 V DC	15...30 V DC	18...30 V DC	18...30 V DC
75 V DC	75 V DC	75 V DC	75 V DC
1.25 mm	3 mm	3 mm	3 mm
5 kΩ	2 kΩ		
No/No/No	Yes/No/Yes	Yes/Yes/Yes	Yes/Yes/Yes
No	No		
+10...+60°C*	-10...+60 °C	-10...+60 °C	-10...+60 °C
±12.0 μm	±10.0 μm	±10.0 μm	±10.0 μm
±45 μm	±120 μm	±150 μm	±150 μm
1 kHz	1 kHz	200 Hz	200 Hz
0.5 ms	1 ms	5 ms	5 ms
0.5 μm/K	-3 μm/K	-3 μm/K	-3 μm/K
IP 67	IP 67	IP 67	IP 67
CE	CE, cULus	CE, cULus	CE, cULus
Anodized aluminum	Anodized aluminum	Anodized aluminum	Anodized aluminum
PBT	PA 12	LCP	LCP
3 m PUR cable, 3×0.14 mm ²	3 m PUR cable, 4×0.14 mm ²	3 m PUR cable, 4×0.14 mm ²	0.75 m PUR cable with M12 connector, 3-pin

- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- Analog Distance Measurement
- Cylinder Designs
- Block Designs**
- Accessories

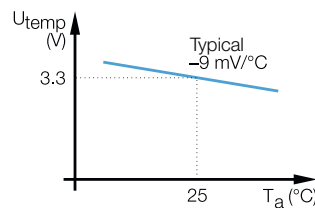


Temperature output



The temperature output (not short-circuit protected) provides a signal representing a precisely measured temperature change.

Temperature output



The temperature output (not short-circuit protected) provides a signal representing a precisely measured temperature change.

Inductive Sensors for Analog Distance Measurement

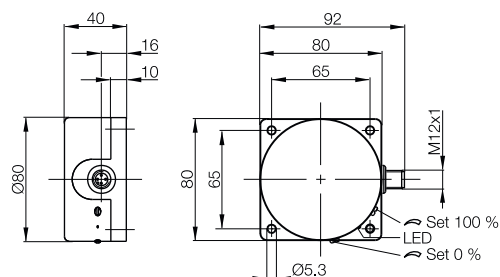
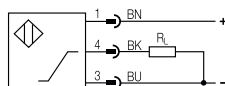
Block designs, 80×80×40 mm



Model	80×80×40 mm Maxisensor
Installation type (observe instructions in the Basic Information chapter)	Not flush
Output signal	Voltage, 0...10 V
Linear range s_l	0...50 mm
Ordering code	BAW003K
Part number	BAW MKK-050.19-S4
Supply voltage U_s	20...30 V DC
Rated insulation voltage U_i (protection class)	75 V DC
Effective distance s_e	25 mm
Load resistance R_L min.	10 k Ω
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes
Adjustment display (LED)	No
Ambient temperature T_a	-10...+70 °C
Repeat accuracy R_{BWN}	$\pm 12.0 \mu\text{m}$
Non-linearity max.	$\pm 1500 \mu\text{m}$
Limit frequency (-3 dB)	15 Hz
Temperature coefficient, typically in range from +10...+50 °C	15 $\mu\text{m/K}$
Degree of protection as per IEC 60529	IP 67
Approvals	CE
Material	Housing: PBT Sensing surface: PBT
Connection	M12 connector, 3-pin

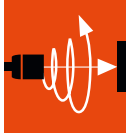
Wiring diagram

Connector, voltage output



Inductive Sensors for Analog Distance Measurement

Block designs, 80×45×20 mm



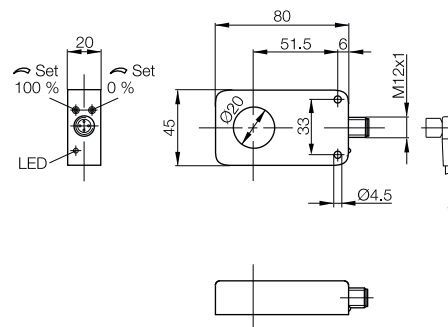
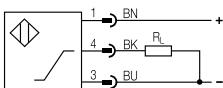
Inductive Sensors
Global DC 3-wire
DC 3-/4-wire
DC 2-wire
AC/DC 2-wire
AC 2-wire
Special Properties
Analog Distance Measurement
Cylinder Designs
Block Designs

Accessories

Model	80×45×20 mm analog ring sensor	
Installation type (observe instructions in the Basic Information chapter)		
Output signal	Voltage, 0...10 V	
Linear range s_L	0...60 mm	
Ordering code	BAW003L	
Part number	BAW MKV-020.19-S4	
Supply voltage U_S	15...30 V DC	
Rated insulation voltage U_i (protection class)	75 V DC	
Effective distance s_e	30 mm	
Load resistance $R_{L \min}$	2 k Ω	
Polarity reversal protected/transposition protected/short-circuit protected	Yes/No/Yes	
Adjustment display (LED)	Yes	
Ambient temperature T_a	-10...+70 °C	
Repeat accuracy R_{BWN}	$\pm 200 \mu\text{m}$	
Non-linearity max.	$\pm 1500 \mu\text{m}$	
Response time	1 ms	
Temperature coefficient, typically in range from +10...+50 °C	100 $\mu\text{m}/\text{K}$	
Degree of protection as per IEC 60529	IP 67	
Approvals	CE	
Material	Housing	PBT
	Sensing surface	PBT
Connection	M12 connector, 3-pin	

Wiring diagram

Connector, voltage output



Compact analog- ring sensor with 20 mm opening. Measured value changes are produced by different metallic objects or insertion depths.

Applications include thickness measurement of various screws, rods or wires, and position measurement on machines by inserting conical objects into the sensor.

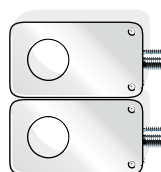
Testing cone for determining insertion depth (measuring range and linearization)



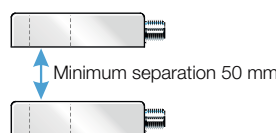
Installation conditions



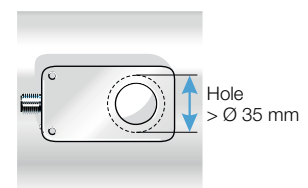
No mutual interference for front-mounting of two sensors.



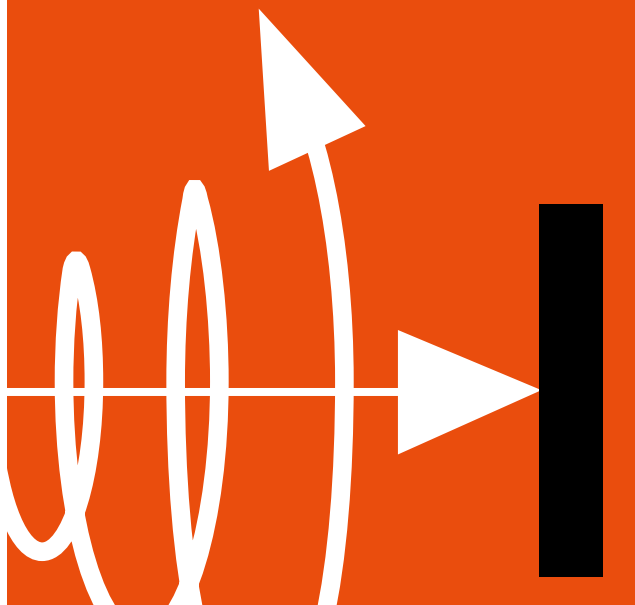
No mutual interference for parallel mounting of two sensors.



When stacking multiple sensors, the separation must be at least 50 mm.



The opening should be at least $\varnothing 35 \text{ mm}$ for flat installation on metal surfaces.



Inductive Sensors

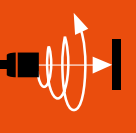
Accessories for inductive sensors

We offer special accessories for our inductive sensors. With products optimally suited to each other. Alongside switching amplifiers, there are also assembly aids and protective equipment for the most varied inductive sensors.



Accessories for Inductive Sensors

Pulse extender	716
Function diagnostics unit	717
Sensor tester, testing and setting device	718
Analog switching amplifiers	720
Assembly aids for Uni and Unicomact sensors	722
Protective coverings for Unicomact sensors	725
Protective end caps	726
Positive stop	728
Tube switch	730
Contact protectors	732



Basic information and definitions can be found on **page 934**.

Detecting fast motion

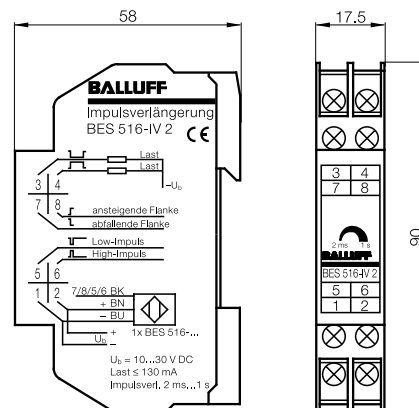
Rapid motions on machines mean that the sensors are only actuated for a short time. Therefore, the sensor pulse can be too short to guarantee a secure evaluation. Due to its cycle time, the controller does not detect the output signal.

As a result: Important information in the controller sequence is lost. This can pose a risk to your machine!

The solution is the Balluff pulse extender **BES 516-IV 2**. For controlling this device, the rising or falling edge of the sensor output signal is sufficient to generate a pulse that your controller can recognize. The length is adjustable from 2 ms to 1 sec. Small and space-saving, the device can be snapped onto a rail in the control cabinet in accordance with EN 50022-35.



Description		Pulse stretching
Use		Ensures secure output signals from inductive, capacitive or optoelectronic sensors to the controller
Ordering code		BAE0073
Part number		BES 516-IV 2
Output (display by LEDs)		Positive-switching (PNP), complementary
Adjustable pulse stretching		2 ms...1 s
Set value		200 ms (+50 ms)
Input 7/8		Referenced to the respective edge of the input signal
Input 5/6		Referenced to the pulse end of the input signal
Reproducibility		< 10 %
Input		1 PNP or 1 NPN - NO or NC
Min. input pulse length		1.5 ms
Supply voltage U_S		10...30 V DC (input voltage = output voltage)
Residual ripple		$\leq 15 \%$
No-load current		Approx. 20 mA
Output current		$\leq 130 \text{ mA}$
Permissible load capacitance		$\leq 0.5 \mu\text{F}/24 \text{ V}$
Ambient temperature T_a		0...60 °C
Housing attachment		DIN rail EN 50022-35
Max. conductor cross-section		2x2.5 mm ²
Polarity reversal protected		Yes
Short-circuit protected		Yes
Degree of protection as per IEC 60529		Housing IP 40/terminals IP 20
Output	3	Low-pulse, extended
	4	High-pulse, extended
Input	7	Falling edge
	8	Rising edge
	5	Low pulse
	6	High pulse
	1	- U_S
	2	+ U_S
Falling edge		Output signal is triggered by rising edge
Rising edge		Output signal is triggered by rising edge
Low pulse		PNP-NC/NPN-NO short damped PNP-NO/NPN-NC short undamped
High pulse		PNP-NC/NPN-NO short damped PNP-NO/NPN-NC short undamped



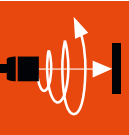
The **BES 113-FD-1** function diagnostics unit monitors a proximity switch with dynamic function diagnostics and its cable. A logic circuit polls the sensor signals for the presence of test pulses and also monitors for proper function of the device. For the machine control system, it emits a high level signal on the "Status/Output" message output when there is no fault and a low signal when faults are present. LEDs indicate the switching state of the sensor.

Faults that occur are stored by the device. They must be reset using a reset function (low signal on 5).

If the BES 113-FD-1 is used as a single unit, terminals VI (3 and 4) must be bridged together.



Description	Function diagnostics unit with electronic output	
Use	Monitoring the dynamic function diagnostics and connection cable for function diagnostics sensors BES 113-356-SA 6-..., BES 113-3019-SA 1-..	
Ordering code	BAE006W	
Part number	BES 113-FD-1	
Supply voltage U_S	20...30 V DC	
No-load current	Approx. 20 mA	
Output voltage U_O	Low	0...(0.1× U_S) when the sensor or diagnostics unit has a fault)
(referenced to 0 V)	High	(0.5× U_S)... U_S when functioning properly
Output current max.	50 mA	
Ambient temperature T_a	0...+60 °C	
LED 1 green	"Ready/Error" – when functioning properly, the LED is on bright. When there is a fault, the LED illuminates dimly.	
LED 2 yellow	"Sensor Output State" indicates the switching state of the sensor.	
Degree of protection as per IEC 60529	Housing IP 40, terminals IP 20	
Housing attachment	Rail mount according to DIN EN 50022-35	
Max. conductor cross-section	2×2.5 mm ²	



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

AC 2-wire

Special Properties

Analog Distance Measurement

Accessories

Pulse Extension

Function Diagnostics Unit

Sensor Tester, Testing and Setting Device

Analog Switching Amplifiers

Assembly Aids for Uni and Unicomact Sensors

Protective Covering for Unicomact Sensors

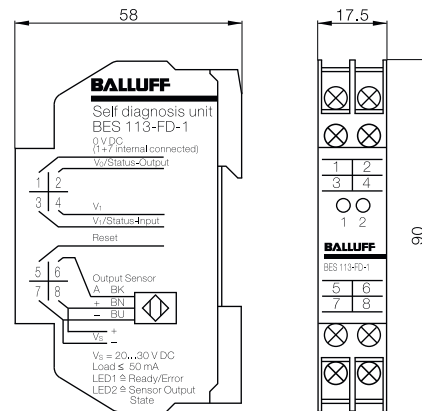
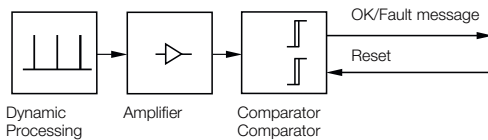
Protective Nuts

Positive Stop

Tube Switch

Contact Protector

Function principle

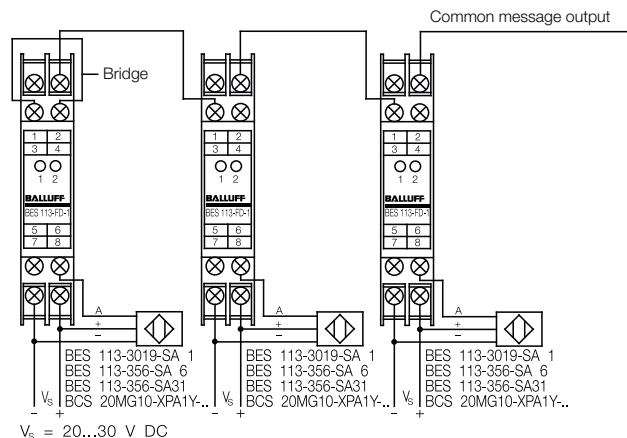


Cascading

When cascading several BES 113-FD-1 (series connection), the output (2) must be connected to the input (3) of the downstream device. The jumper between VI is not needed except for the first device. When there is a malfunction, the message appears on the last device.

The defective sensor is indicated by the first weakly illuminated LED in the cascade.

Small and space-saving, the BES 113-FD-1 can be mounted in a DIN rail according to DIN EN 50022-35.



Accessories for Inductive Sensors

Sensor tester, testing and setting device

Tester BES 516-7

The sensor tester BES 516-7, in the Balluff design, is flat, handy, and visually appealing. The testing device is a simple manual testing device for PNP/NPN, normally open and normally closed sensors.

Benefits

- Integrated steel measuring plate for testing sensors
- Automatic shut-off after 30 s of non-use
- Power provided by a 9V battery
- Visual and acoustic signal

Note

Tester is not suitable for 2-wire and Desina sensors

Testing and setting device BES 516-4

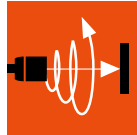
With this programming device, the following testing and setting functions can be carried out on the sensors:

- Programming the switching distance of analog sensors.
- Sensors with teachable switching points can also be programmed.
- Testing 3-wire sensors.
- Testing 2-wire sensors.



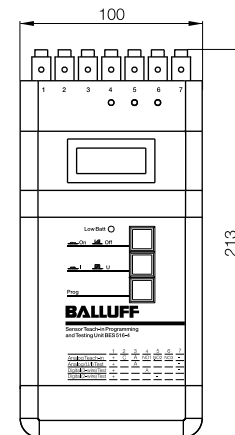
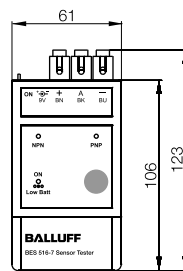


Description	Sensor tester	Testing and setting device
Use	For DC PNP/NPN 3-wire sensors	For DC PNP/NPN 2/3-wire sensors and analog sensors
Ordering code	BAE002C	BAE0029
Part number	BES 516-7	BES 516-4
Output voltage	18 V DC	18 V DC
LED indicators	1 operating indicator	3 function indicators, 1 operating indicator
Battery type	1 x 9 V battery	2 x 9 V batteries
Sensor connection	3 spring-loaded terminals	7 spring-loaded terminals
Degree of protection as per IEC 60529	IP 40	IP 40
Housing material	Plastic	Plastic



- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- Analog Distance measurement
- Accessories
- Pulse Extension
- Function Diagnostics Unit
- Sensor Tester, Testing and Setting Device**
- Analog Switching Amplifiers
- Assembly Aids for Uni and Unicomact Sensors
- Protective Covering for Unicomact Sensors
- Protective Nuts
- Positive Stop
- Tube Switch
- Contact Protector

Acoustic and visual signal, built-in steel measuring plate



Accessories for Inductive Sensors

Analog switching amplifiers for onsite assembly for inductive distance sensors BAW

Analog switching amplifiers for onsite assembly

This switching amplifier allows you to easily program sensors which have an analog output signal, such as the BOD family, with three switching thresholds, onsite.

In this, the sensor connected to the switching amplifier is brought into the desired switching distance from the object. Then connecting the control line to the (+) side of the supply voltage enables a "Teach-in" mode; in other words, the set distance is assigned to the signal level present and these values are stored in the evaluation device. This procedure is supported with LEDs. During operation, these LEDs are available as switching state indicators.

For sensors with a temperature output, the analog temperature signal is made available in unchanged form on the device output.



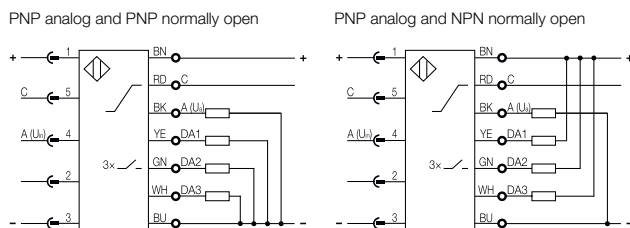
Connection example

Analog sensors

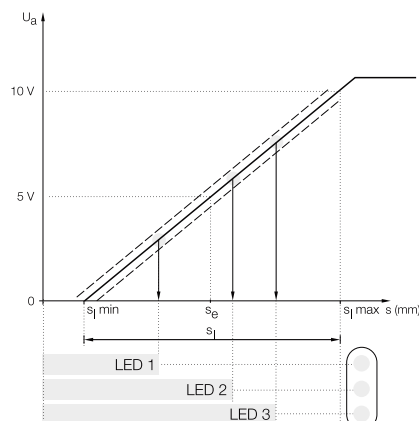
Analog switching amplifier



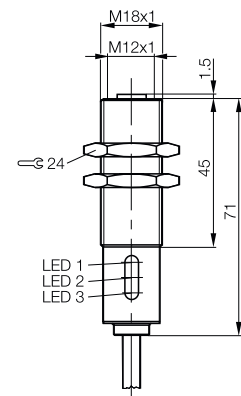
Wiring diagrams



Approach curve



Size	M18x1	
Use	For analog sensors	
PNP analog and PNP NO	Ordering code	BAE0070
	Part number	BES 516-615-PS-1-PU-05
PNP analog and NPN NO	Ordering code	BAE006Z
	Part number	BES 516-615-NS-1-PU-05
Rated operating voltage U_e	15...30 V DC	
Supply voltage U_s	15...30 V DC	
Residual ripple	$\leq 15\%$ of U_e	
Rated insulation voltage U_i	75 V DC	
Rated operating current I_e per output	100 mA	
No-load supply current I_0 max.	≤ 20 mA	
Off-state current I_r	≤ 10 μ A	
Polarity reversal protected	Only against \pm -reversal	
Short-circuit protected	Yes	
Ambient temperature T_a	$-10...+70$ °C	
Switching frequency f	2 kHz	
Utilization category	DC 13	
Function indicator for each output	Yes	
Analog input		
Input voltage U_{in}	0...10 V (implemented to output A)	
Input impedance	4.2 k Ω	
Switching outputs		
Freely programmable switching outputs	3	
Hysteresis H	500 mV	
Temperature drift	$\leq 2\%$ of U_{in} max.	
Degree of protection as per IEC 60529	IP 67	
Housing material	CuZn coated	
Connection	Input	M12 connector, 5-pin
	Output	5 m PUR cable, 7x0.25 mm ²



Accessories for Inductive Sensors

Analog switching amplifier for control cabinet installation for inductive distance sensors BAW

Analog switching amplifier for control cabinet installation

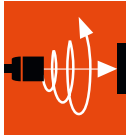
The analog switching amplifier is operated with 24 V and provides the supply voltage for analog sensors such as the Balluff BOD. The device is controlled directly by the current signals (2) or voltage signals (4).

From this signal, separate push-pull final stages (PNP/NPN) are used to create three switch points (A1...A3) which can be set independently using the potentiometer (on the front side). The respective switching state is indicated by LEDs. The operating direction (rising/falling) can be set using DIP switches inside the unit. This circuit allows width-adjustable "ranges" to be defined (cascading).

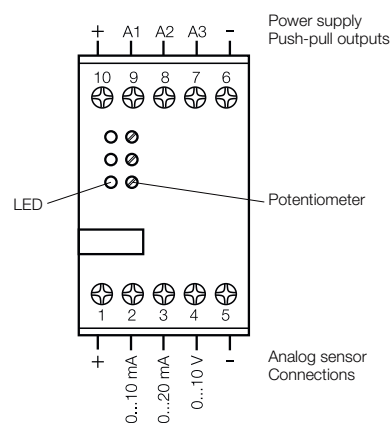
The voltage signal (4) proportional to the current can be used to drive additional analog switching amplifiers (expansion for additional switching points). The signal inputs on the analog switching amplifier are protected against polarity reversal and the push-pull output stages against short circuit (internal fuses).



Description	Analog switching amplifier for analog current and voltage signals
Use	Switching point setting on analog sensors, e.g. BOD, BAW
Ordering code	BAE006Y
Part number	BES 516-611-A-1
Supply voltage U_s	24 V DC $\pm 10\%$
Residual ripple	$\leq 10\%$
Input circuit	
Current input, terminal 2/3	0...10 mA/0...20 mA
Input resistance	308 Ω /154 Ω
Voltage input terminal 4	0...10 V
Input resistance	13 k Ω
Setting range	3...100 %
Hysteresis (referenced to set value)	3 %
Output current circuit	
Voltage drop PNP-transistor	≤ 3.5 V
Voltage drop NPN-transistor	≤ 2.5 V
Operating current per push-pull stage	≤ 200 mA
Housing material	PC (glass fiber reinforced)
Housing dimensions	74x45x120 mm
Connection type	Screw terminals
Max. conductor cross-section	Up to 2.5 mm ²
Housing attachment	Snap-mount on DIN rail
Ambient temperature T_a	0...+50 °C
Degree of protection as per IEC 60529	Terminals IP 20, housing IP 40



- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
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- AC/DC 2-wire
- AC 2-wire
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- Accessories
- Pulse Extension
- Function Diagnostics Unit
- Sensor Tester, Testing and Setting Device

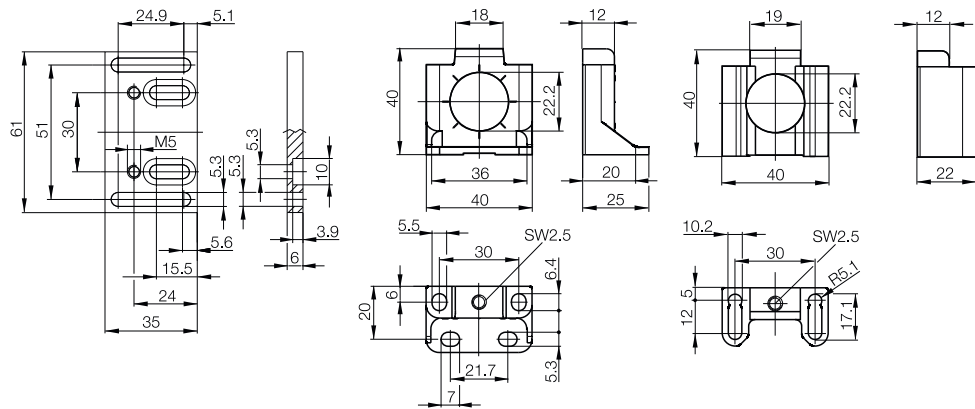


- Analog Switching Amplifiers**
- Assembly Aids for Uni and Unicomact Sensors
- Protective Covering for Unicomact Sensors
- Protective Nuts
- Positive Stop
- Tube Switch
- Contact Protector

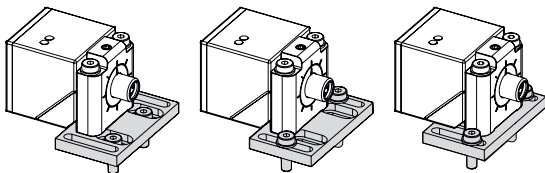


Description	Unicomcompact mounting bracket	Unicomcompact mounting base	Unicomcompact mounting base
Use	for BES Q40KFU-... Unicomcompact sensors (40x40 mm)	for BES Q40KFU-... Unicomcompact sensors (40x40 mm)	for BES Q40KFU-... Unicomcompact sensors (40x40 mm)
Ordering code	BAM00JW	BAM00JY	BAM00JZ
Part number	BES Q40-HW-1	BES Q40-HW-2	BES Q40-HW-3
Material	Anodized aluminum	Anodized aluminum	Anodized aluminum

Please note permissible installation options!

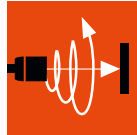


3 different mounting options





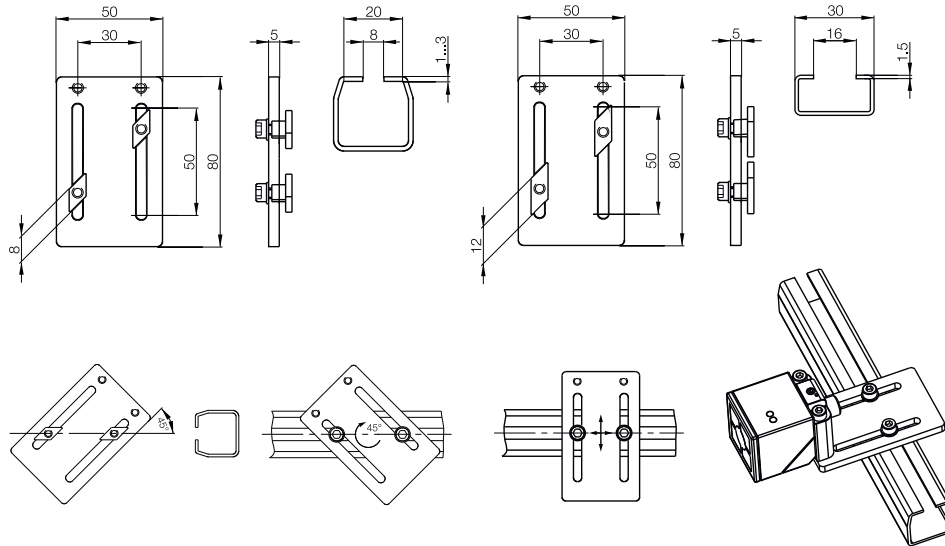
Description	Unicomcompact holding system	Unicomcompact holding system
Use	Unicomcompact sensors for fastening to profile rails (groove width: 8 mm)	Unicomcompact sensors for fastening to profile rails (groove width: 16 mm)
Ordering code	BAM00JU	BAM00JT
Part number	BES HS-01-P1-C8/Q40	BES HS-01-P1-C16/Q40
Material	Al anodized, CuZn	Al anodized, CuZn



- Inductive Sensors
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- Protective Covering for Unicomcompact Sensors
- Protective Nuts
- Positive Stop
- Tube Switch
- Contact Protector

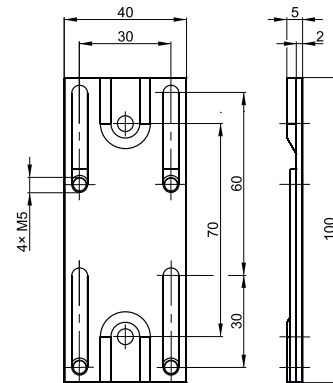
The fastener set consists of:

- 1 mounting plate
- 2 slot nuts
- 2 cheese head screws M5x10 DIN 912
- 2 washers Ø 5.3, DIN 533
- 2 cheese head screws M5x40, ISO 4762





Description	Mounting plate - Unisensor and Unicomact
Use	For Unisensor and Unicomact sensors (40x40 mm)
Ordering code	
Part number	Mounting plate B 4 - 2057
Material	Anodized aluminum

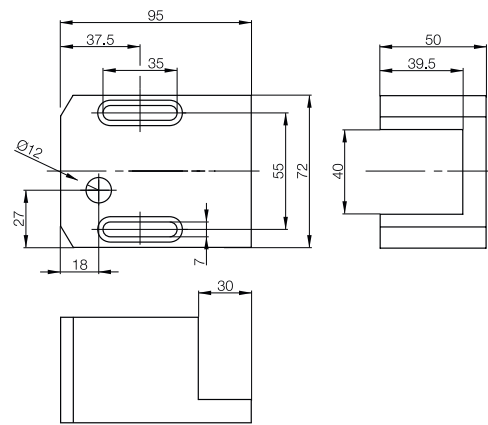
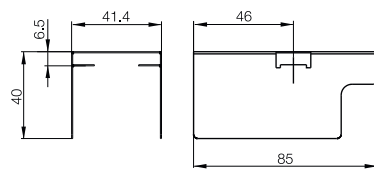
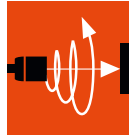


Uni sensors can be moved on this assembly plate in a wired state up to 30 mm. Loosening the sensor fastening screws (M5x25; included in scope of delivery) allows the sensor to be easily moved and fastened at the desired location. Tighten screws!



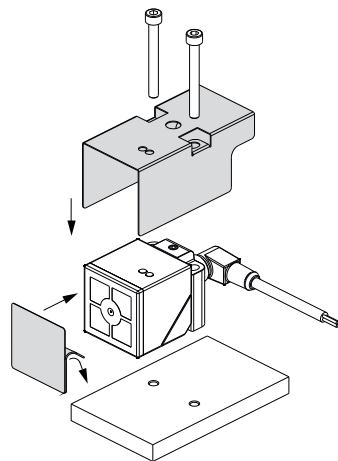


Description	Weld protection - Unicomcompact	Protective cover - Unicomcompact
Use	For BES Q40KFU-... magnetic field resistant Unicomcompact sensors (40x40 mm)	for BES Q40KFU-... Unicomcompact sensors (40x40 mm)
Ordering code	BAM00K0	BAM00K1
Part number	BES Q40-SH-1	BES Q40-SH-2
Material	Anodized aluminum	PA 6



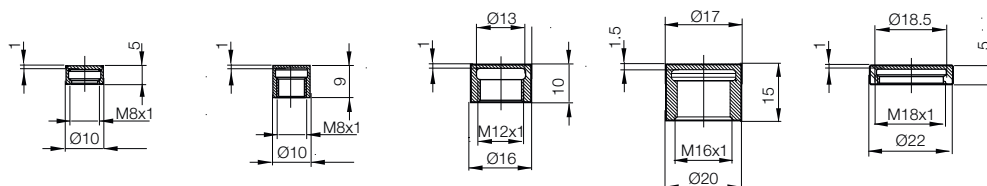
- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special Properties
- Analog Distance Measurement
- Accessories
- Pulse Extension
- Function Diagnostics Unit
- Sensor Tester, Testing and Setting Device
- Analog Switching Amplifiers
- Assembly Aids for Uni and Unicomcompact Sensors**
- Protective Covering for Unicomcompact Sensors**
- Protective Nuts
- Positive Stop
- Tube Switch
- Contact Protector

The weld protection consists of a protective cover and a self-adhering PTFE film for protecting the active surface. If the sensor head is replaced, the welding protection must not be removed.





Description	Cover nut	Cover nut	Cover nut	Cover nut	Cover nut	
Use	For M8 sensors	For M8 sensors	For M12 sensors	For M16 sensors	For M18 sensors	
Ordering code	BAM009Z	BAM00A0	BAM00C2	BAM00EP	BAM00EZ	
Part number	BES 08-SM-1	BES 08-SM-1F	BES 12-SM-2	BES 16-SM-2	BES 18-SM-1	
Reduction of the rated switching distance	1 mm	1 mm	1 mm	1.5 mm	1 mm	
Material	PTFE	PTFE	POM	PTFE	PTFE	



These protective nuts are screwed onto sensors. They are made of PTFE or POM and are used when there is increased mechanical stress.

The protective nuts are also used to protect the sensing surface from weld spatter. They can also be used at high temperatures and are particularly resistant against chemical influences.

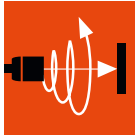
Material	POM	PTFE
Ambient temperature T_a	-20...+90 °C	-20...+100 °C

Please note!

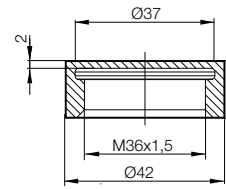
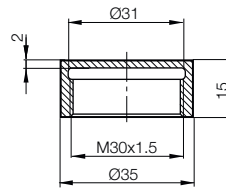
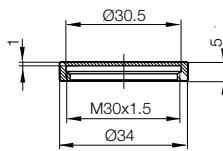
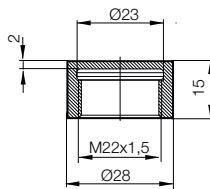
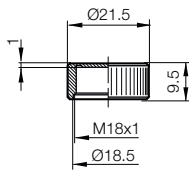
The rated switching distance of sensors is reduced to the wall thickness of the nut when the protective nut is installed.



Cover nut	Cover nut	Cover nut	Cover nut	Cover nut
For M18 sensors	For M18 sensors	For M30 sensors	For M30 sensors	For M36 sensors
BAM00FO	BAM00H8	BAM00HJ	BAM00HK	BAM00JL
BES 18-SM-2	BES 22-SM-2	BES 30-SM-1	BES 30-SM-2	BES 36-SM-2
1 mm	2 mm	1 mm	2 mm	2 mm
POM	PTFE	POM	POM	POM



Inductive Sensors



- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire

Special Properties

Analog Distance Measurement

Accessories

- Pulse Extension
- Function Diagnostics Unit
- Sensor Tester, Testing and Setting Device
- Analog Switching Amplifiers
- Assembly Aids for Uni and Unicomact Sensors
- Protective Covering for Unicomact Sensors

Protective Nuts

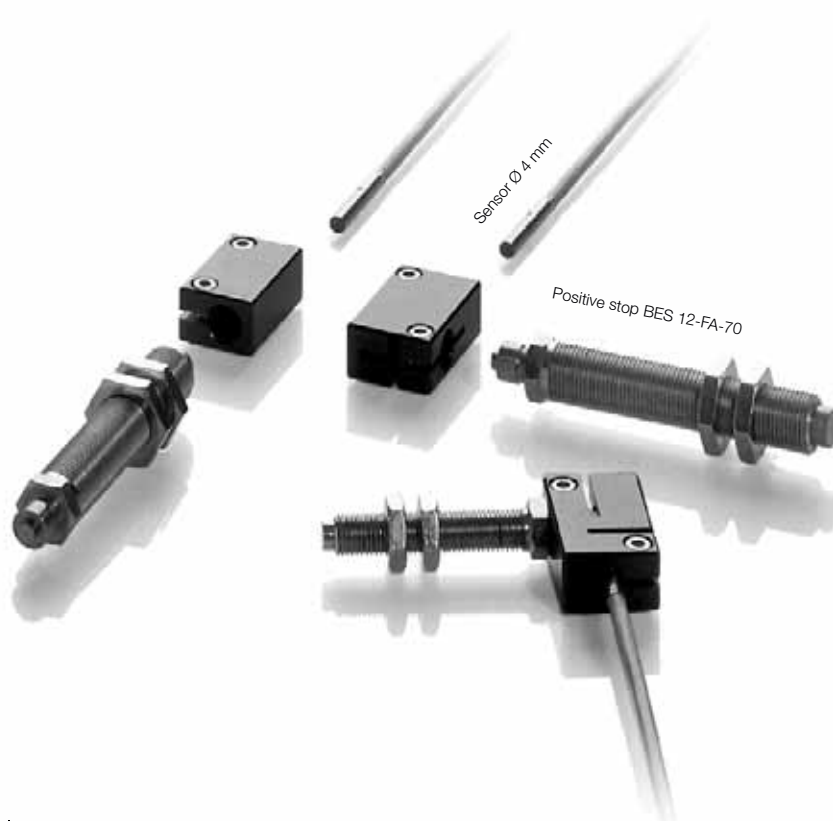
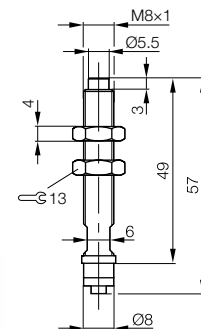
- Positive Stop
- Tube Switch
- Contact Protector

Positive stops for sensors with diameters of 4 mm or 8 mm

A positive stop that is combined with the corresponding mounting cuff can be added to inductive sensors with housing \varnothing 4 mm or \varnothing 8 mm. The desired switching point between the proximity switch and the trigger pin can be set wherever needed.

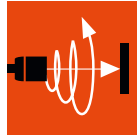


Description	Positive stop
Use	For inductive sensors for mechanical protection
Ordering code	BAM009L
Part number	BES 08-FA-49
Ordering code	
Part number	
Temperature resistance	-25...+100 °C
Spring force	3 N
Impact force $F_{max.}$ (N)	100
Spring deflection	2 mm
Permissible torque	15 Nm
Material	Stainless steel





Positive stop	Positive stop	Mounting cuff - straight for positive stop	Mounting cuff - angled for positive stop
For inductive sensors for mechanical protection	For inductive sensors for mechanical protection	For sensors with \varnothing 4 mm or \varnothing 8 mm	For sensors with \varnothing 4 mm or \varnothing 8 mm
BAM009M	BAM00AZ	BAM009N	BAM009P
BES 08-FA-89	BES 12-FA-70	BES 08-FA-BS-4,0-G	BES 08-FA-BS-4,0-W
		BAM009R	BAM009T
		BES 08-FA-BS-8,0-G	BES 08-FA-BS-8,0-W
-25...+100 °C	-25...+100 °C	-25...+100 °C	-25...+100 °C
3 N	4 N		
100	100		
2 mm	32 mm		
15 Nm	25 Nm	15 Nm	15 Nm
Stainless steel	Stainless steel	Anodized Al	Anodized Al



Inductive Sensors
Global DC 3-wire
DC 3-/4-wire
DC 2-wire
AC/DC 2-wire

AC 2-wire

Special Properties

Analog Distance Measurement

Accessories
Pulse Extension

Function Diagnostics Unit

Sensor Tester, Testing and Setting Device

Analog Switching Amplifiers

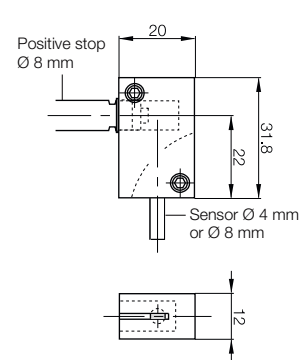
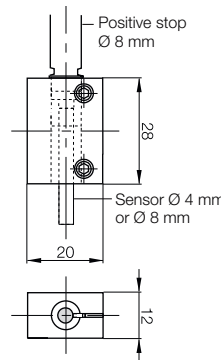
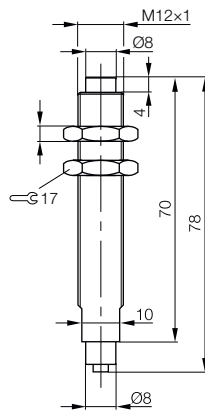
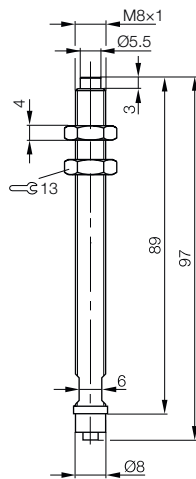
Assembly Aids for Uni and Unicomact Sensors

Protective Covering for Unicomact Sensors

Protective Nuts

Positive Stop

Tube Switch
Contact Protec-



Accessories for Inductive Sensors

Tube switch

- Mechanical actuation – non-contact switching
- Protects the sensor from mechanical damage
- Plug and safe

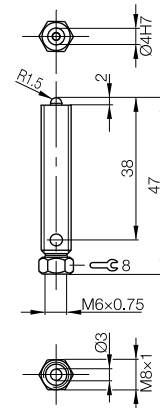
Rapid application – high reliability

The set includes a pre-assembled tube switch, which means you only need to set up the sensor. The tube switch also combines the advantages offered by mechanical and inductive switches.

Manufactured from stainless steel, it is extremely robust and very reliable, even under difficult conditions.

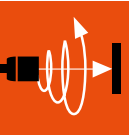


Description	Tube switch
Use	For sensors dia. 4 mm for mechanical protection
Ordering code	BAM01C0
Part number	BAM FS-XE-002-D4-4
Spring force F (N)	3
Impact force F_{max} (N)	400
Switching operations min. (with F_{max})	500000
Housing material	Stainless steel





Tube switch	Tube switch	Tube switch	
For M5 sensors for mechanical protection	For M5 sensors for mechanical protection	For M8 sensors for mechanical protection	
BAM01AZ	BAM019Y	BAM019W	
BAM FS-XE-001-M5-4	BAM FS-XE-003-M5-4	BAM FS-XE-004-M8-4	
3	3	4	
400	400	400	
500000	500000	500000	
Stainless steel	Stainless steel	Stainless steel	



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

AC 2-wire

Special Properties

Analog Distance Measurement

Accessories

Pulse

Extension

Function

Diagnostics Unit

Sensor Tester,

Testing and Set-

ting Device

Analog Switching

Amplifiers

Assembly Aids

for Uni and

Unicomact

Sensors

Protective

Covering for

Unicomact

Sensors

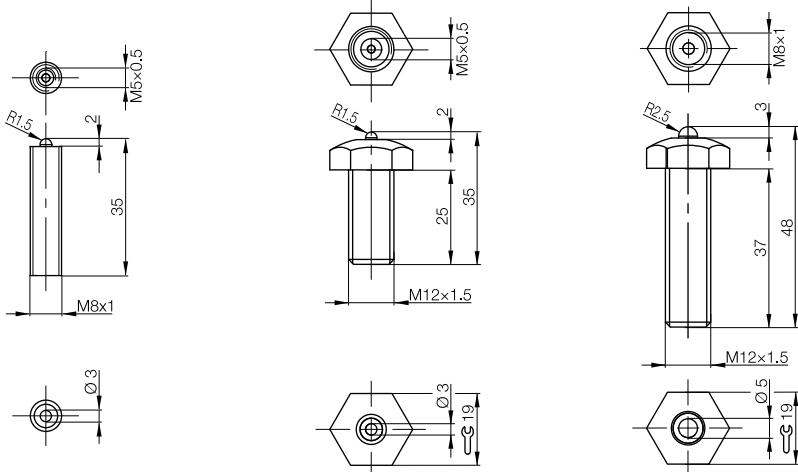
Protective Nuts

Positive Stop

Tube Switch

Contact Protec-

tor

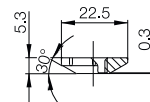
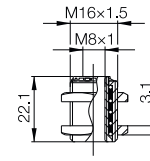


Contact protector for sensors

The contact protector absorbs contacts with displacement of up to 15 mm without the sensor being damaged. The object strikes an attached protective cap and then pushes the sensor back. Damage to the sensor or coil is thereby prevented.

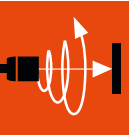


Description	Contact protector
Use	For M8 sensors for mechanical protection
Ordering code	BAM015U
Part number	BESA-08-CM
WAF	22
Ambient temperature	-45...+85 °C
Material	Anodized Al, POM





Contact protector	Contact protector	Contact protector	
For M12 sensors for mechanical protection	For M18 sensors for mechanical protection	For M30 sensors for mechanical protection	
BAM015W	BAM015Y	BAM015Z	
BESA-12-CM	BESA-18-CM	BESA-30-CM	
29	35	51	
-45...+85 °C	-45...+85 °C	-45...+85 °C	
Anodized Al, POM	Anodized Al, POM	Anodized Al, POM	



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

AC 2-wire

Special Properties

Analog Distance Measurement

Accessories

Pulse Extension

Function Diagnostics Unit

Sensor Tester, Testing and Setting Device

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