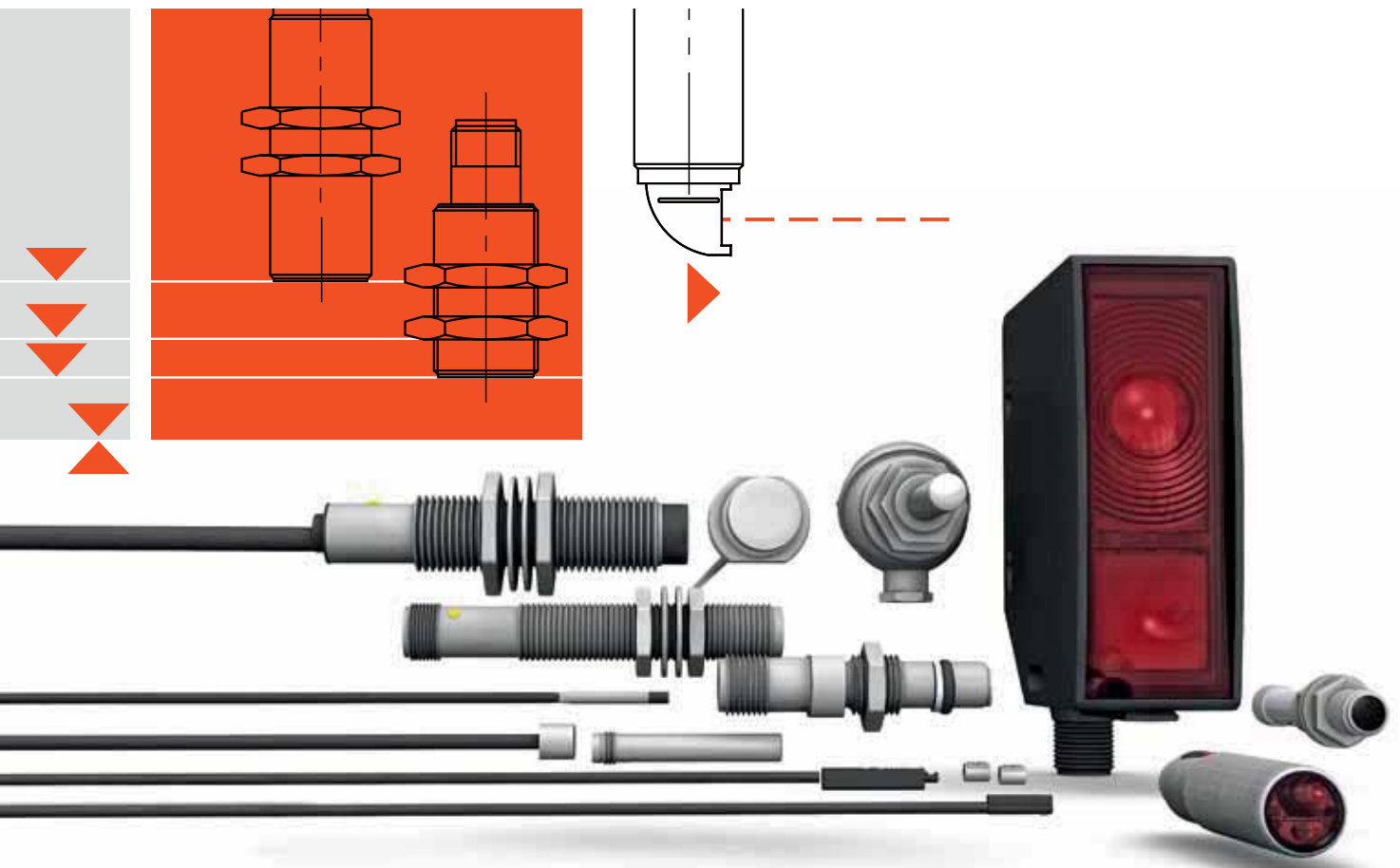


BALLUFF

sensors worldwide

Object Detection

Sophisticated sensor technology for all areas of automation





With over 50 years of sensor experience, Balluff is a leading global sensor specialist with its own line of connectivity products for every area of factory automation. Balluff is based in Germany and has a tight international network of 54 representatives and subsidiaries.

Benefit from comprehensive sensor expertise from a single source. Achieve solutions suited to your requirements.

Balluff stands for comprehensive systems from a single source, continuous innovation, state-of-the-art technology, highest quality, and greatest reliability. That's not all: Balluff also stands for exceptional customer orientation, customized solutions, fast worldwide service, and outstanding application assistance.



High-quality, innovative products tested in our own accredited laboratory and a quality management system certified according to DIN ISO 9001 (EN 2008) form a secure foundation for optimized added value for our customers.

Whether electronic and mechanical sensors, rotary and linear transducers, identification systems or optimized connection technology for high-performance automation, Balluff masters not only the entire technological variety with all of the different operating principles, but also provides technology that fulfills regional quality standards and is suitable for use worldwide. Wherever you are in the world, Balluff technology is never far away. You won't have to look far for your nearest Balluff expert.



Balluff products increase performance, quality and productivity around the world every day. They satisfy prerequisites for meeting demands for greater performance and cost reductions on the global market. Including in the most demanding areas. No matter how stringent your requirements may be, Balluff delivers state-of-the-art solutions.





Object Detection

Sophisticated sensor technology for all areas of automation

Photoelectric sensors

14



Inductive sensors

408



Capacitive sensors

700



Magnetic cylinder sensors

780



Industrial networking and connectivity – A selection

844

You will find many additional products in our total product line, "Industrial networking and connectivity – Intelligent and comprehensive networking for system technology".



Accessories – A selection

876

You will find many additional products in our total product line, "Accessories product line – Optimal peripherals for sensors".



Basic information and definitions

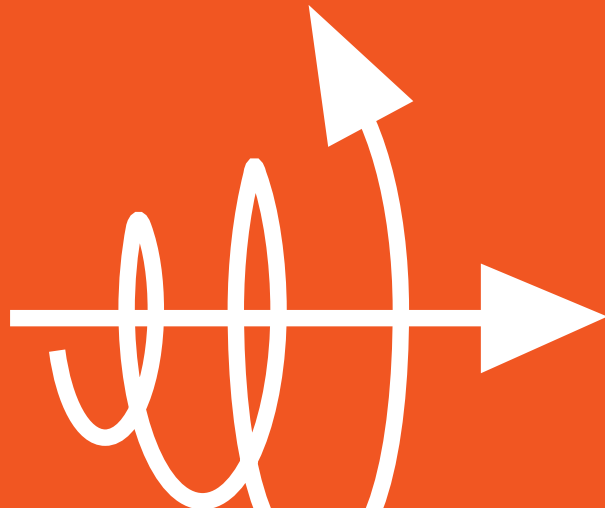
884



Alphanumerical directory
Worldwide Sales

930
958

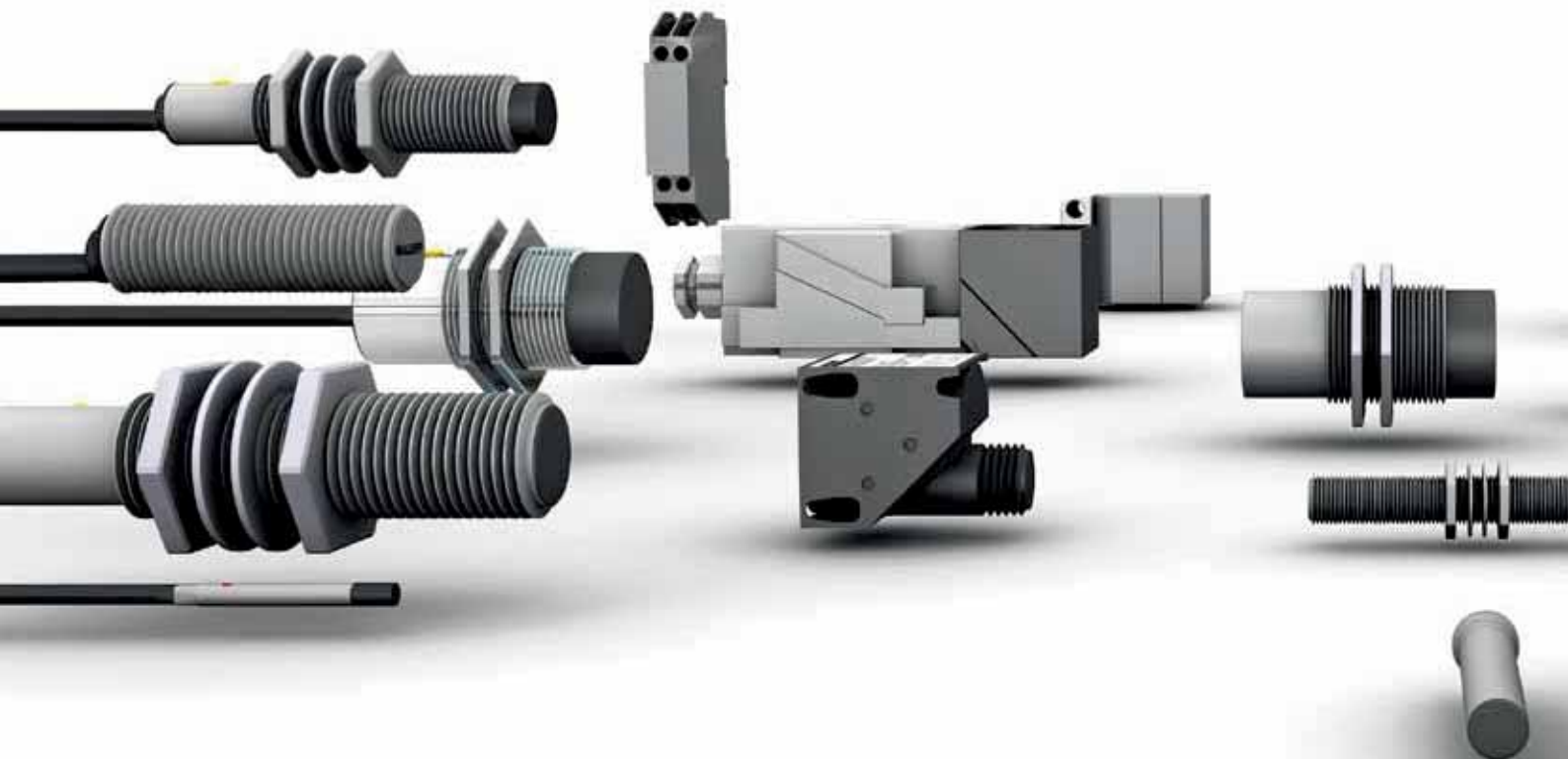




Inductive Sensors

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 rated to "Factor 1" from mini to maxi: You too can take advantage of Balluff's versatility in your applications. And profit from the reliability and quality of proven products from your full-line provider.



Inductive Sensors

Contents

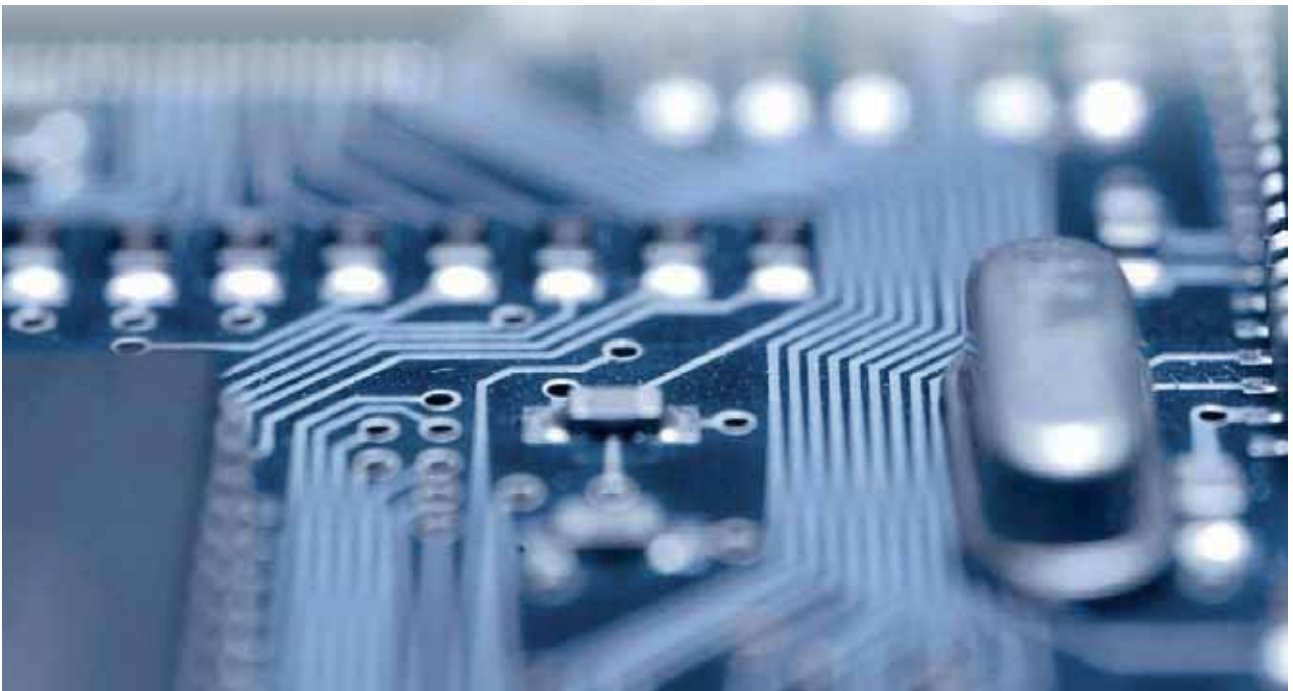
Inductive sensors			Inductive sensors with special properties	
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Product overview	412		Ex sensors	600
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			Contact protectors	696
			Clamping holder overview	698



Basic information and definitions can be found on **page 884**.



DC 3-/4-Wire	F1
DC 2-Wire	PTFE Coated Weld Immune
AC/DC 2-Wire	500_{bar} High Pressure
	120°C High Temperature
IP68 BWN Pr27 BWN Pr20	Stainless Steel



Inductive Sensors Performance spectrum



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 standard sensors							
DC 3-wire Global			page 419	page 425		page 428	
DC 3-/4-wire	page 437	page 442	page 446	page 472		page 480	
DC 2-wire			page 535	page 537		page 540	
AC/DC 2-wire				page 555		page 556	
AC 2-wire				page 574		page 576	

Inductive Sensors with Special Properties							
High pressure-rated sensors		page 583 page 585 page 590	page 591	page 583 page 585 page 592	page 588	page 590 page 599	
Ex sensors			page 604	page 600 page 602		page 601 page 605	
Steelface sensors			page 607	page 608		page 609	
Temperature-resistant sensors		page 612	page 612	page 612		page 613	
Sensors for the food industry				page 616		page 618	
Factor 1 sensors			page 627	page 628		page 630	
Weld and magnetic field im- mune sensors				page 639		page 641	
Diagnostics sensors				page 647		page 647	
Large design							
Hose sensors							
Ring sensors							

Inductive distance sensors for analog distance measurement							
Tubular-style housings			page 662	page 663		page 667	
Block designs							
Ring sensors							

Inductive Sensors

Product overview



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



M30×1.5	5×5 mm	8×8 mm	8×16 mm R04	10×30 mm R03	16.5×30 mm	20×32 mm R01	99×17.6 mm
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page 431							
page 489	page 495	page 498	page 504	page 506	page 508	page 509	
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				page 673			

Inductive Sensors

Product overview



Housing size	25x50 mm	26x26 mm	26x40 mm	42x48 mm	74x60.5 mm	40x40 mm Unicompact
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Inductive standard sensors							
DC 3-wire Global							
DC 3-/4-wire	page 511		page 512	page 514	page 515	page 517	
DC 2-wire		page 547				page 548	
AC/DC 2-wire			page 563			page 565	
AC 2-wire							

Inductive Sensors with Special Properties							
High pressure-rated sensors							
Ex sensors						page 605	
Steelface sensors							
Temperature-resistant sensors	page 613						
Sensors for the food industry							
Factor 1 sensors						page 635	
Weld and magnetic field immune sensors						page 645	
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Large design							
Hose sensors							
Ring sensors							

Inductive distance sensors for analog distance measurement							
Tubular-style housings							
Block designs							
Ring sensors							

Inductive Sensors

Product overview



	40x40 mm Unisensor	80x80 mm Maxisensor	35x35 mm	Ø 80x67 mm	Ø 110x110 mm	Ring sensors	Hose sen- sors
	page 521	page 528					
	page 549	page 550					
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		page 579					
			page 653	page 652	page 653		
							page 657
						page 655	
					page 676		
						page 677	

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



Inductive Sensors

DC 3-wire inductive Global Sensors

DC 3-wire inductive global sensors: The complete series in the standard segment. 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 design

Ø 6.5 mm
M8×1
M12×1
M18×1
M30×1.5

419
420
425
428
431



Global



Basic information
and definitions
can be found
on **page 884**.

DC 3-wire Inductive Global Sensors

Cylinder design

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 M30×1.5
- Shielded and unshielded designs
- Cable and connector versions
- Standard and extended switching distance



Series		
Installation type (observe instructions in 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_B		
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		

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

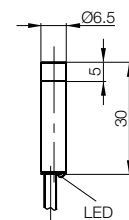
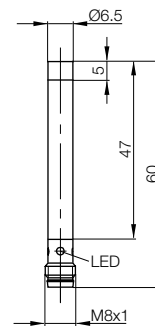
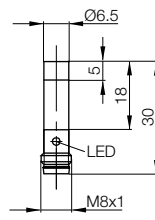
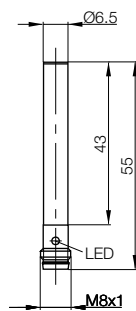
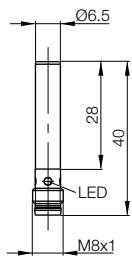
Additional cable lengths and PUR cable jacket material available on request.





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

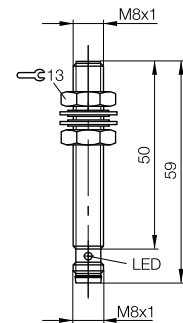
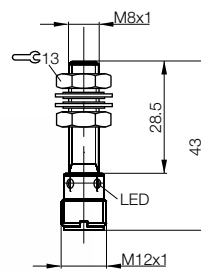
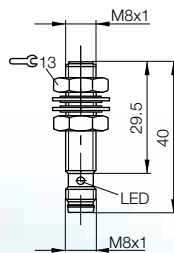
Cylinder designs, M8x1



Series		M8 x 1	M8 x 1	M8 x 1
Installation type (observe instructions in 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, NC	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_B		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 (□)	250 V AC (□)	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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



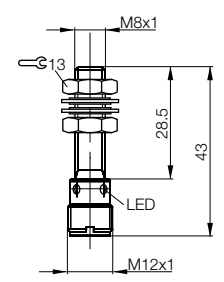
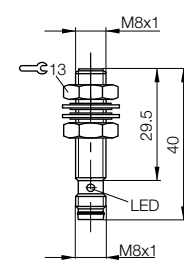
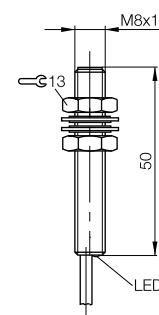
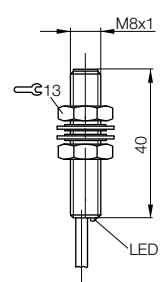
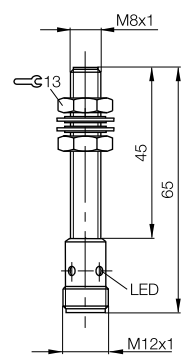
DC 3-wire Inductive Global Sensors Cylinder designs, M8x1



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



M8 x 1	M8 x 1	M8 x 1	M8 x 1	M8 x 1
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



DC 3-wire Inductive Global Sensors

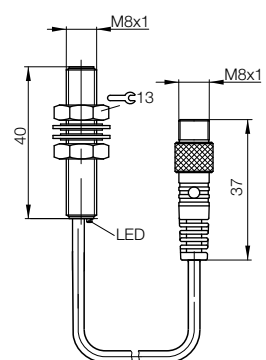
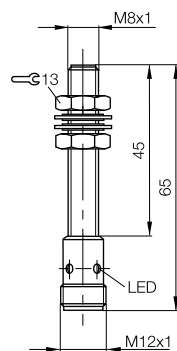
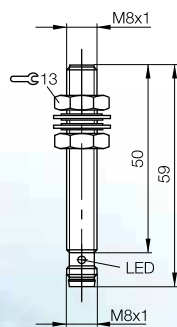
Cylinder designs, M8x1



Series		M8 x 1	M8 x 1	M8 x 1
Installation type (observe instructions in 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, NC	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_B		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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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

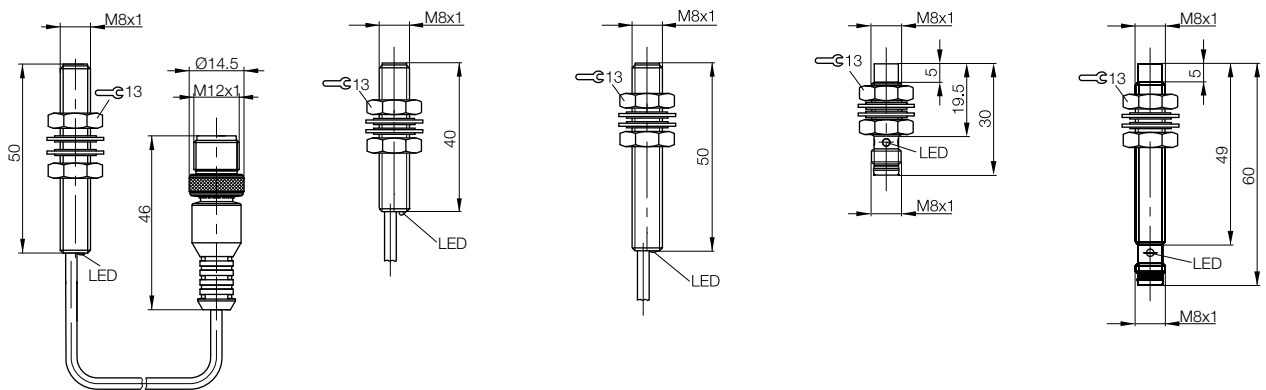


DC 3-wire Inductive Global Sensors Cylinder designs, M8x1



M8 x 1	M8 x 1	M8 x 1	M8 x 1	M8 x 1
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
■ ■	■ ■	■ ■	■ ■	■ ■
BES003E	BES00CW	BES003K	BES000M	BES001J
BES M08MI-PSC20B-BP00,2-GS04	BES M08EF-PSC20B-BP02-003	BES M08MI-PSC20B-BV02	BES M08EB-PSC40F-S49G	BES M08EH-PSC40F-S49G
	BES00CT	BES03TH	BES000L	BES001F
	BES M08EF-POC20B-BP02-003	BES M08MI-POC20B-BV02	BES M08EB-POC40F-S49G	BES M08EH-POC40F-S49G
	BES00CP	BES002P	BES000K	BES001C
	BES M08EF-NSC20B-BP02-003	BES M08MI-NSC20B-BV02	BES M08EB-NSC40F-S49G	BES M08EH-NSC40F-S49G
	BES00CM	BES03TF	BES000J	BES0019
	BES M08EF-NOC20B-BP02-003	BES M08MI-NOC20B-BV02	BES M08EB-NOC40F-S49G	BES M08EH-NOC40F-S49G
12...30 V DC	10...30 V DC	12...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 (□)	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
700 Hz	700 Hz	700 Hz	1.5 kHz	1.5 kHz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
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
Brass-coated	Stainless steel	Brass-coated	Stainless steel	Stainless steel
PA 12	PBT	PA 12	PBT	PBT
0.2 m PUR cable with M12 connector, 4-pin	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
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

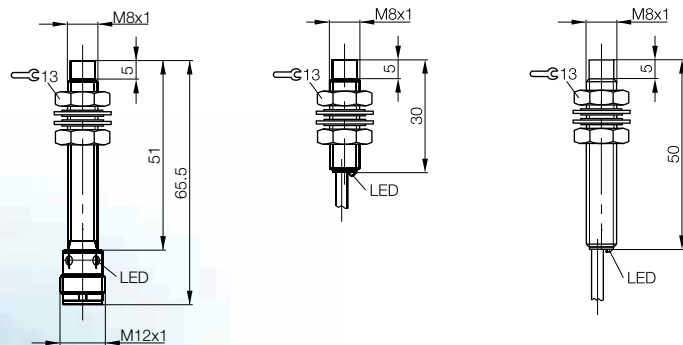
Cylinder designs, M8x1



Series		M8 x 1	M8 x 1	M8 x 1
Installation type (observe instructions in 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, NC	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_B		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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



DC 3-wire Inductive Global Sensors

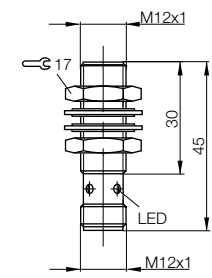
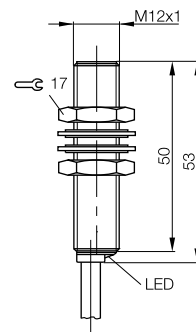
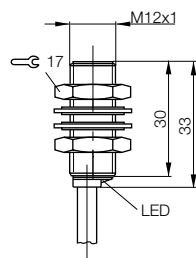
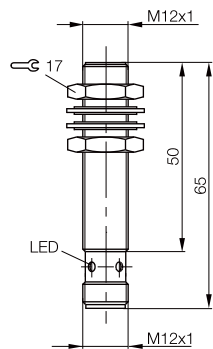
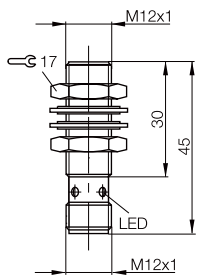
Cylinder design, M12x1



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



M12x1	M12x1	M12x1	M12x1	M12x1	M12x1
Flush	Flush	Flush	Flush	Flush	Flush
2 mm	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...1.6 mm	0...3.2 mm
■	■	■	■	■	■ ■
BES00EE	BES0060	BES00E4	BES005U	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	BES M12ME-PSC40B-S04G-003
BES00EA	BES005F	BES00E2	BES00FP	BES00EC	BES00EC
BES M12ME-POC20B-S04G-003	BES M12MI-POC20B-S04G	BES M12MD-POC20B-BP02-003	BES M12MI-POC20B-BV02	BES M12ME-POC40B-S04G-003	BES M12ME-POC40B-S04G-003
BES00E8	BES0054	BES00E0	BES00FL	BES00E9	BES00E9
BES M12ME-NSC20B-S04G-003	BES M12MI-NSC20B-S04G	BES M12MD-NSC20B-BP02-003	BES M12MI-NSC20B-BV02	BES M12ME-NSC40B-S04G-003	BES M12ME-NSC40B-S04G-003
BES00E6	BES004Y	BES00CY	BES03PR	BES00E7	BES00E7
BES M12ME-NOC20B-S04G-003	BES M12MI-NOC20B-S04G	BES M12MD-NOC20B-BP02-003	BES M12MI-NOC20B-BV02	BES M12ME-NOC40B-S04G-003	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	10...30 V DC
2 V	2.5 V	2 V	2.5 V	2.5 V	2.5 V
250 V AC (□)	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	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
1.2 kHz	1.2 kHz	1.2 kHz	1.2 kHz	1.2 kHz	300 Hz
Yellow LED	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	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	PA 12	PBT	PA 12	LCP	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	M12 connector, 4-pin



DC 3-wire Inductive Global Sensors

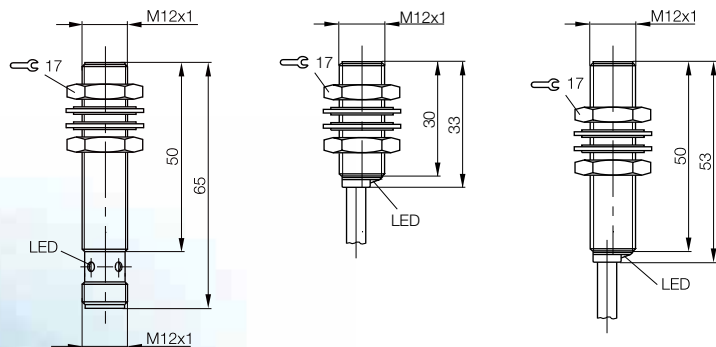
Cylinder design, M12x1



Series		M12x1	M12x1	M12x1
Installation type (observe instructions in 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, NC	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_B		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

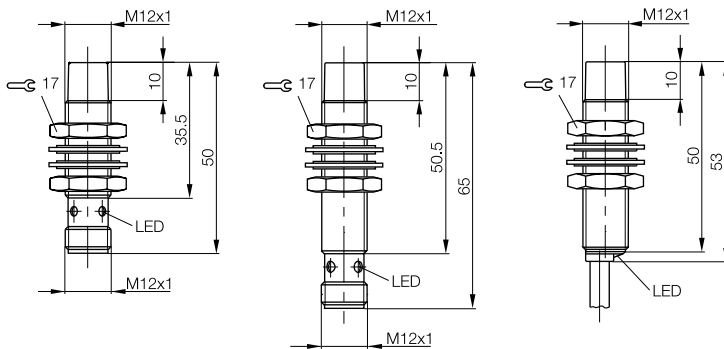
Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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





M12x1	M12x1	M12x1			Inductive sensors
Not flush	Not flush	Not flush			Global DC 3-wire
8 mm	8 mm	8 mm			Cylinder designs
0...6.4 mm	0...6.4 mm	0...6.4 mm			DC 3-/4-wire
■ ■	■ ■	■ ■			DC 2-wire
BES01PY	BES004N	BES004M			AC/DC 2-wire
BES M12MD-PSC80F-S04G	BES M12MG-PSC80F-S04G	BES M12MG-PSC80F-BV02			AC 2-wire
BES01PU	BES004K	BES004J			Special properties
BES M12MD-POC80F-S04G	BES M12MG-POC80F-S04G	BES M12MG-POC80F-BV02			Analog distance measurement
BES01PT	BES004F	BES004E			Accessories
BES M12MD-NSC80F-S04G	BES M12MG-NSC80F-S04G	BES M12MG-NSC80F-BV02			
BES01PR	BES004A	BES0049			
BES M12MD-NOC80F-S04G	BES M12MG-NOC80F-S04G	BES M12MG-NOC80F-BV02			
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			
800 Hz	800 Hz	800 Hz			
Yellow LED	Yellow LED	Yellow LED			
IP 68 per BWN Pr. 20	IP 67	IP 67			
CE, cULus	CE, cULus	CE, cULus			
Brass-coated	Brass-coated	Brass-coated			
PBT	PBT	PBT			
M12 connector, 4-pin	M12 connector, 4-pin	2 m PVC cable, 3x0.34 mm ²			



DC 3-wire Inductive Global Sensors

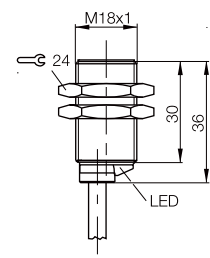
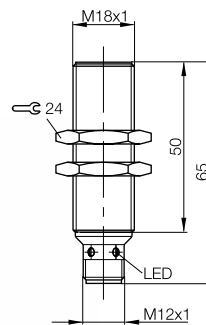
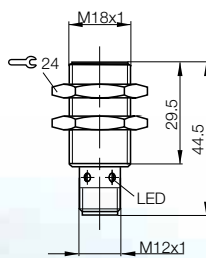
Cylinder design, M18x1



Series		M18x1	M18x1	M18x1
Installation type (observe instructions in 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, NC	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_B		10...30 V DC	12...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		2 V	2.5 V	2 V
Rated insulation voltage U_i (protection class)		75 V DC	250 V AC (□)	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.		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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



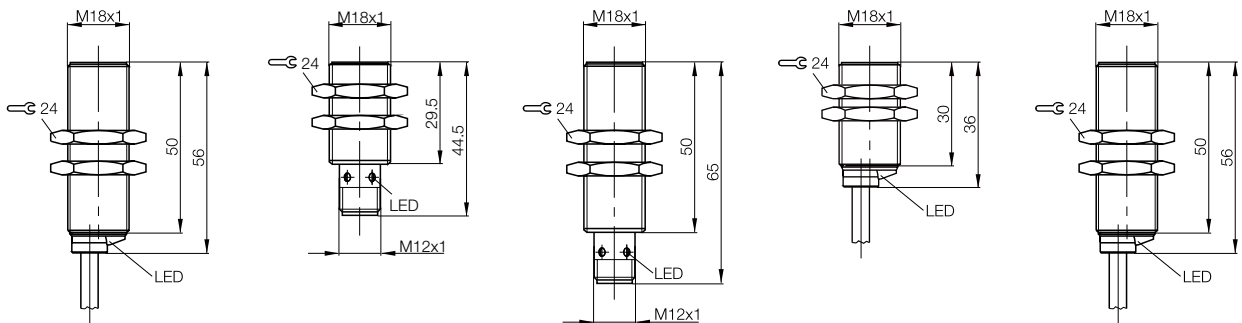
DC 3-wire Inductive Global Sensors Cylinder design, M18x1



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



M18x1	M18x1	M18x1	M18x1	M18x1
Flush	Flush	Flush	Flush	Flush
5 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
■	■ ■	■ ■	■ ■	■ ■
BES0082	BES00EZ	BES008L	BES00EP	BES008E
BES M18MI-PSC50B-BV02	BES M18ME-PSC80B-S04G-003	BES M18MI-PSC80B-S04G	BES M18MD-PSC80B-BP02-003	BES M18MI-PSC80B-BV02
BES007R	BES00EW	BES03RP	BES00EM	BES03PY
BES M18MI-POC50B-BV02	BES M18ME-POC80B-S04G-003	BES M18MI-POC80B-S04G	BES M18MD-POC80B-BP02-003	BES M18MI-POC80B-BV02
BES007A	BES00ET	BES007L	BES00EK	BES00FE
BES M18MI-NSC50B-BV02	BES M18ME-NSC80B-S04G-003	BES M18MI-NSC80B-S04G	BES M18MD-NSC80B-BP02-003	BES M18MI-NSC80B-BV02
BES03RR	BES03RN	BES0077	BES00EH	BES03T4
BES M18MI-NOC50B-BV02	BES M18ME-NOC80B-S04G-003	BES M18MI-NOC80B-S04G	BES M18MD-NOC80B-BP02-003	BES M18MI-NOC80B-BV02
12...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	12...30 V DC
2.5 V	3.5 V	2.5 V	3.5 V	2.5 V
250 V AC (□)	75 V DC	250 V AC (□)	75 V DC	250 V AC (□)
200 mA	130 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
700 Hz	150 Hz	1 kHz	150 Hz	150 Hz
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
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Brass-coated	Brass-coated	Brass-coated	Brass-coated	Brass-coated
PA 12	PBT	PBT	PBT	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



DC 3-wire Inductive Global Sensors

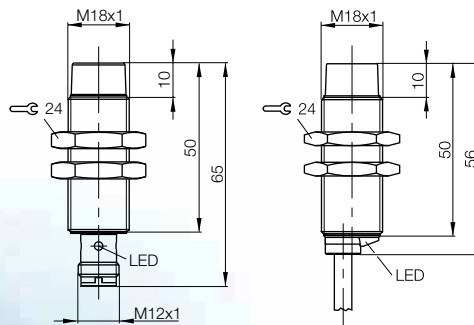
Cylinder design, M18x1



Series		M18x1	M18x1	
Installation type (observe instructions in 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, NC	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_B		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	

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



Global

DC 3-wire Inductive Global Sensors

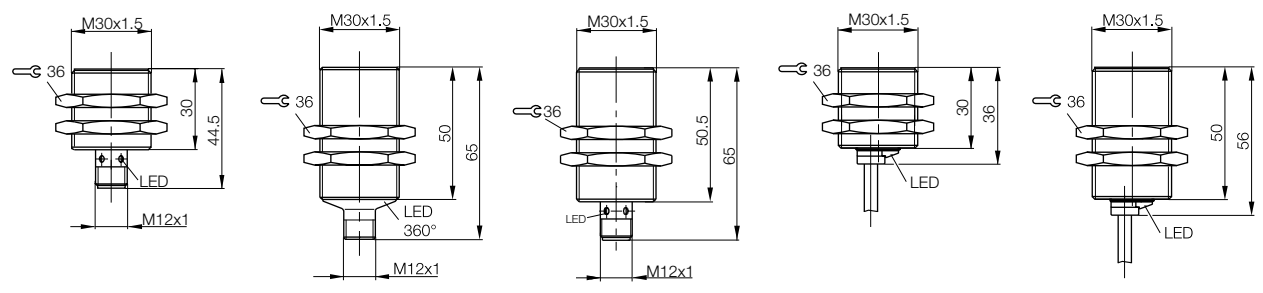
Cylinder design, M30x1.5



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



M30x1.5	M30x1.5	M30x1.5	M30x1.5	M30x1.5	M30x1.5
Flush	Flush	Flush	Flush	Flush	Flush
10 mm	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	0...8.1 mm
■	■	■	■	■	■
BES00F8	BES00A4	BES00A3	BES00F3	BES00A0	BES00A0
BES M30ME-PSC10B-S04G-003	BES M30MI-PSC10B-S04K	BES M30MI-PSC10B-S04G	BES M30MD-PSC10B-BP02-003	BES M30MI-PSC10B-BV02	BES M30MI-PSC10B-BV02
BES00F6	BES009P	BES043H	BES03TC	BES009M	BES009M
BES M30ME-POC10B-S04G-003	BES M30MI-POC10B-S04K	BES M30MI-POC10B-S04G	BES M30MD-POC10B-BP02-003	BES M30MI-POC10B-BV02	BES M30MI-POC10B-BV02
BES00F5	BES009H		BES00F0	BES009C	BES009C
BES M30ME-NSC10B-S04G-003	BES M30MI-NSC10B-S04K		BES M30MD-NSC10B-BP02-003	BES M30MI-NSC10B-BV02	BES M30MI-NSC10B-BV02
BES03TA	BES0097		BES03TE	BES0096	BES0096
BES M30ME-NOC10B-S04G-003	BES M30MI-NOC10B-S04K		BES M30MD-NOC10B-BP02-003	BES M30MI-NOC10B-BV02	BES M30MI-NOC10B-BV02
10...30 V DC	12...30 V DC	12...30 V DC	10...30 V DC	12...30 V DC	12...30 V DC
3.5 V	2.5 V	2.5 V	3.5 V	2.5 V	2.5 V
75 V DC	250 V AC (□)	75 V DC	75 V DC	250 V AC (□)	250 V AC (□)
130 mA	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	Yes/Yes/Yes
-25...70 °C	-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	400 Hz
Yellow LED	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	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	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	2 m PVC cable, 3x0.34 mm ²



DC 3-wire Inductive Global Sensors

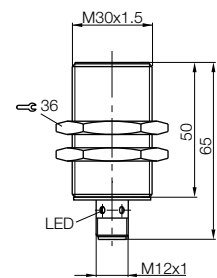
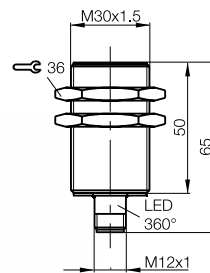
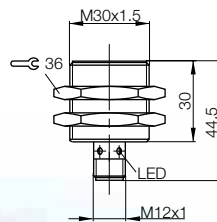
Cylinder design, M30x1.5



Series		M30x1.5	M30x1.5	M30x1.5
Installation type (observe instructions in 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, NC	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_B		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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



DC 3-wire Inductive Global Sensors

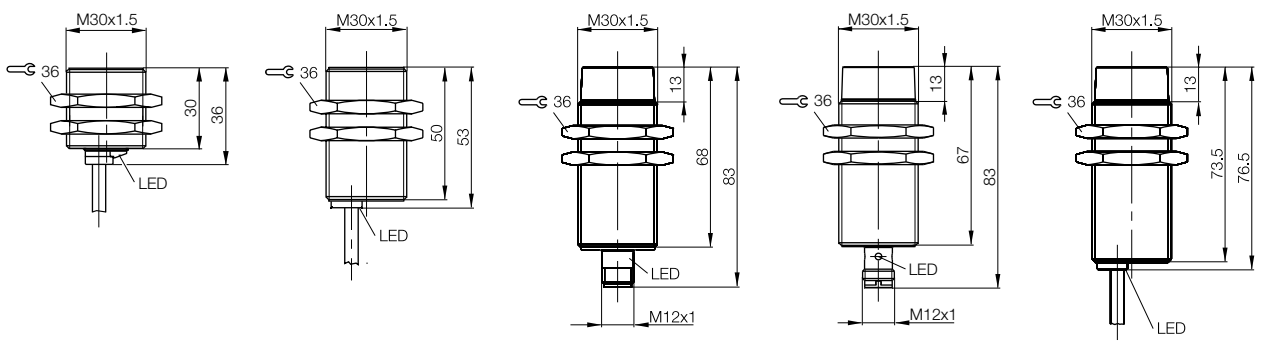
Cylinder design, M30x1.5

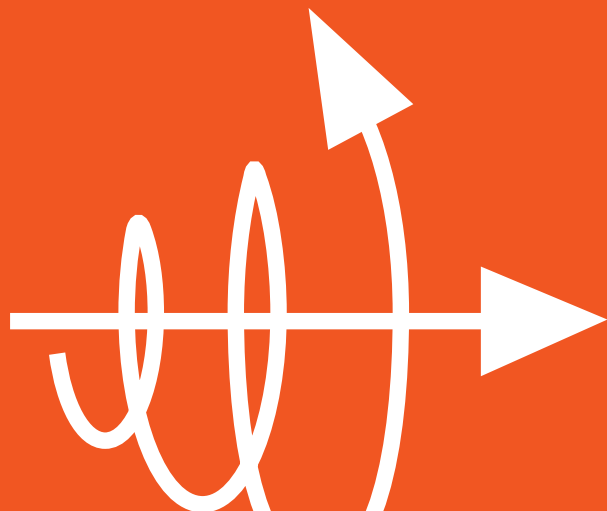


Inductive sensors
Global DC 3-wire
Cylinder designs
DC 3-/4-wire
DC 2-wire
AC/DC 2-wire
AC 2-wire
Special properties
Analog distance measurement
Accessories



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	10...30 V DC
3.5 V	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 (□)	250 V AC (□)
130 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	-25...70 °C
75 Hz	100 Hz	300 Hz	300 Hz	300 Hz	300 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, 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	PA 12	PBT	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

DC 3-/4-wire inductive standard 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 \varnothing 3 mm to 80x80 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	436
Ø 4 mm	438
M4x0.5	441
M5x0.5	442
Ø 6.5 mm	446
Ø 8 mm	454
M8x1	455
M12x1	472
M18x1	480
M30x1.5	489

Block designs

5x5 mm	495
8x8 mm	498
8x16x4 mm (R04)	504
10x30x6 mm (R03)	506
30x20x10 mm	507
16x30x10 mm	508
20x32x8 mm (R01)	509
20x50x10 mm	511
26x40x12 mm (R05)	512
42x48x22 mm	514
74x60.5x28 mm	515
40x40 mm (Unicompact)	516
40x40 mm (Unisensor)	520
80x80 mm (Maxisensor)	528



Basic information and definitions can be found on **page 884**.



DC 3-/4-wire Inductive Standard 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.



Series		
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	
NPN, NO	Ordering code	
	Part number	
Supply voltage U_B		
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		

Connection-Switching diagram, see page 906

The meaning of switching distance markings can be found on page 911

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

SuperShorties and slim designs

Inductive mini sensors are available with especially small diameter: with 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



DC 3-/4-wire Inductive Standard Sensors

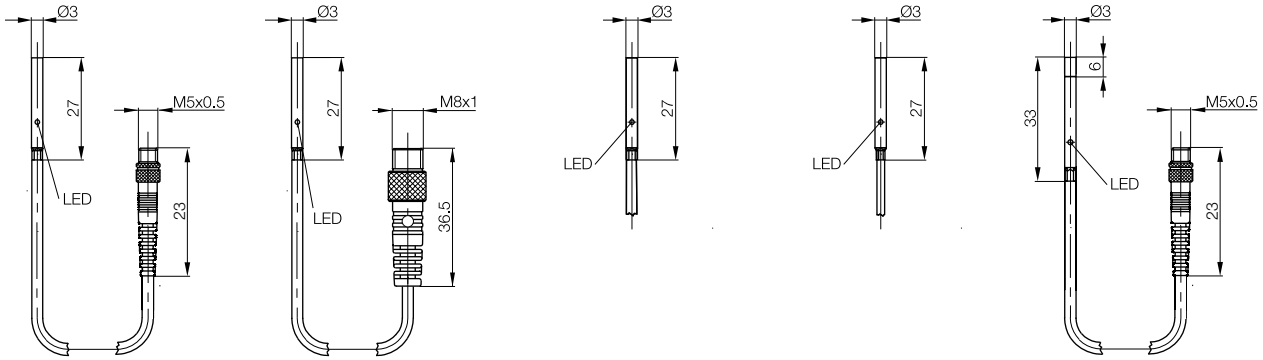
Cylinder designs, Ø 3 mm



Inductive sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder designs
Block designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Analog distance measurement
Special properties
Special accessories



Ø 3 mm	Ø 3 mm	Ø 3 mm	Ø 3 mm	Ø 3 mm
Flush	Flush	Flush	Flush	Not flush
1 mm	1 mm	1 mm	1 mm	3 mm
0...0.8 mm	0...0.8 mm	0...0.8 mm	0...0.8 mm	0...2.3 mm
■ ■	■ ■	■ ■	■ ■	■ ■
BES0468	BES00M5	BES00M3		BES00MH
BES 516-3044-G-E4-C-S26-00,3	BES 516-3044-G-E4-C-S49-00,3	BES 516-3044-G-E4-C-PU-02		BES 516-3048-G-E4-C-S26-00,3
	BES0415	BES00M7		
	BES G03ED-POC10B-EP00,3-GS49	BES 516-3045-G-E4-C-PU-02		
			BES00M9	
			BES 516-3046-G-E4-L-PU-02	
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	21.6...26.4 V DC
2.5 V	2.5 V	2.5 V	1.5 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	50 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/No	Yes/Yes/Yes
-25...+70°C	-25...+70°C	-25...+70°C	0...+70 °C	0...+70 °C
2 kHz	2 kHz	2 kHz	5 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	CE, cULus
Narrow design	Narrow design	Narrow design	Narrow design	Narrow design
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
POM	POM	POM	POM	PET-C
0.3 m PUR cable with M5 connector, 4-pin	0.3 m PUR cable with M8 connector, 3-pin	2 m PUR cable, 3x0.1 mm ²	2 m PUR cable, 3x0.1 mm ²	0.3 m PUR cable with M5 connector, 4-pin



DC 3-/4-wire Inductive Standard Sensors

Cylinder design, Ø 3 mm, Ø 4 mm



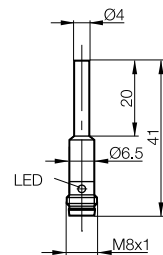
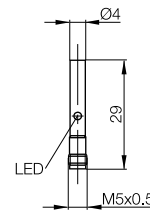
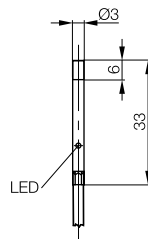
TRIPLEPROX



		Ø 3 mm	Ø 4 mm	Ø 4 mm
Series		Not flush	Flush	Flush
Installation type (pay attention to the note in the Basic Information chapter)		Not flush	Flush	Flush
Rated switching distance s_n		3 mm	0.8 mm	0.8 mm
Assured switching distance s_a		0...2.3 mm	0...0.65 mm	0...0.65 mm
Switching distance marking		■■■	■	■
PNP, NO	Ordering code	BES00ME	BES0122	BES00J5
	Part number	BES 516-3048-G-E4-C-PU-02	BES G04EC-PSC08B-S26G	BES 516-3007-E5-C-S49
PNP, NC	Ordering code	BES00MJ	BES0120	BES00K4
	Part number	BES 516-3049-G-E4-C-PU-02	BES G04EC-POC08B-S26G	BES 516-3017-E5-C-S49
NPN, NO	Ordering code		BES011Y	
	Part number		BES G04EC-NSC08B-S26G	
NPN, NC	Ordering code		BES011W	BES00KF
	Part number		BES G04EC-NOC08B-S26G	BES 516-3018-E5-C-S49
Supply voltage U_B		21.6...26.4 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e 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_e		50 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		0...+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, large switching distance	Narrow design	Narrow design
Material	Housing	Stainless steel	Stainless steel	Stainless steel
	Sensing surface	PET-C	PBT	PBT
Connection		2 m PUR cable, 3x0.1 mm ²	M5 connector, 4-pin	M8 connector, 3-pin

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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

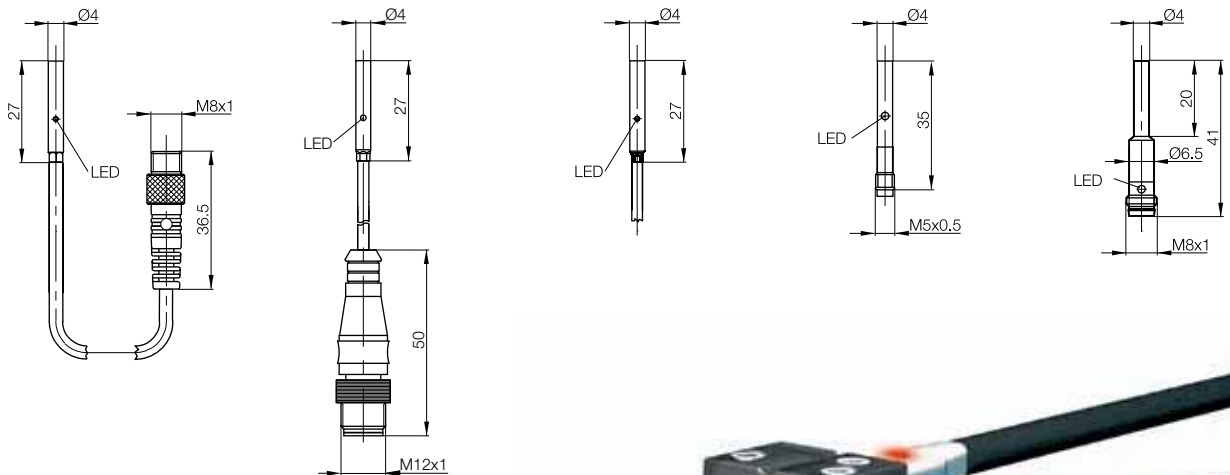


DC 3-/4-wire Inductive Standard Sensors Cylinder designs, Ø 4 mm



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	1.5 mm	1.5 mm
0...0.65 mm	0...0.65 mm	0...0.65 mm	0...1.2 mm	0...1.2 mm
■	■	■	■ ■	■ ■
BES00J3	BES00J0	BES00HW	BES012F	BES00JN
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	BES 516-3007-G-E5-C-S49
BES00K3		BES00K1	BES012A	BES00KA
BES 516-3017-E4-C-S49-00,3		BES 516-3017-E4-C-PU-02	BES G04ED-POC15B-S26G	BES 516-3017-G-E5-C-S49
		BES00JP	BES0126	BES00K0
		BES 516-3008-E4-C-PU-02	BES G04ED-NSC15B-S26G	BES 516-3008-G-E5-C-S49
		BES00KC	BES0123	BES00KK
		BES 516-3018-E4-C-PU-02	BES G04ED-NOC15B-S26G	BES 516-3018-G-E5-C-S49
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 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	M8 connector, 3-pin

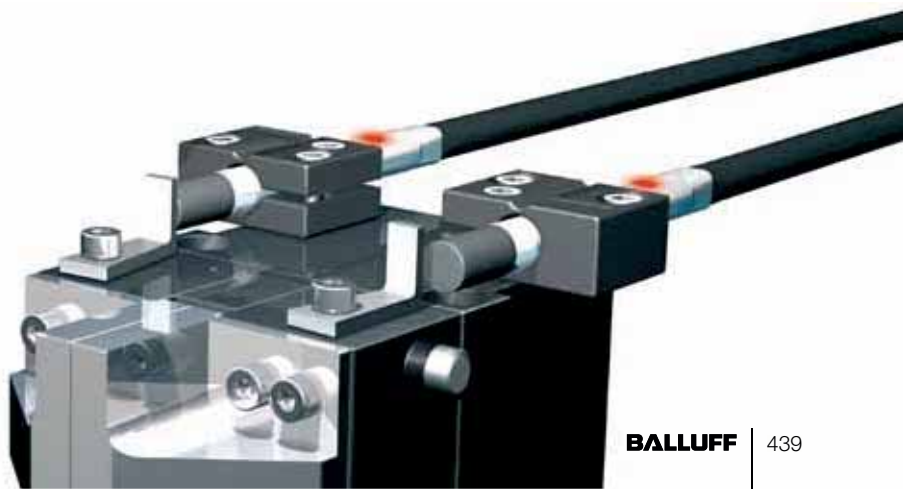
Inductive sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder designs
Block designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Analog distance measurement
Special properties
Special accessories



mini.s

Mini design – Maximum power

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



DC 3-/4-wire Inductive Standard Sensors

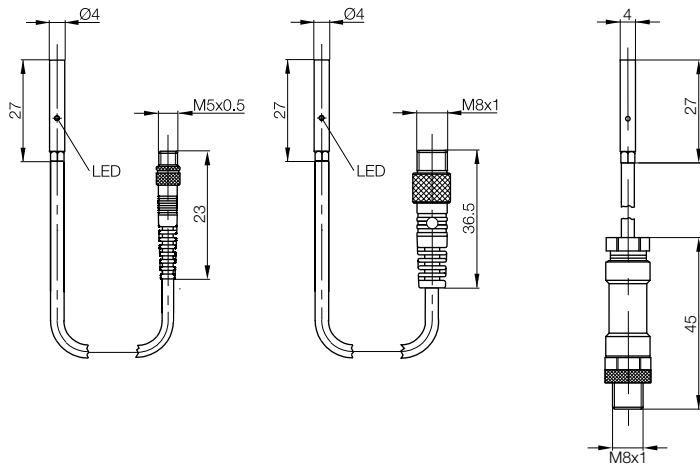
Cylinder design, Ø 4 mm



		Ø 4 mm	Ø 4 mm	Ø 4 mm
Series		Ø 4 mm	Ø 4 mm	Ø 4 mm
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
Switching distance marking		■ ■	■ ■	■ ■
PNP, NO	Ordering code	BES00J8	BES00JJ	
	Part number	BES 516-3007-G-E4-C-S26-00,2	BES 516-3007-G-E4-C-S49-00,3	
PNP, NC	Ordering code		BES00K9	
	Part number		BES 516-3017-G-E4-C-S49-00,3	
NPN, NO	Ordering code			BES0156
	Part number			BES 516-3008-G-E4-C-S49-PU-00,3
NPN, NC	Ordering code			
	Part number			
Supply voltage U_B		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	1.8 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		0.2 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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



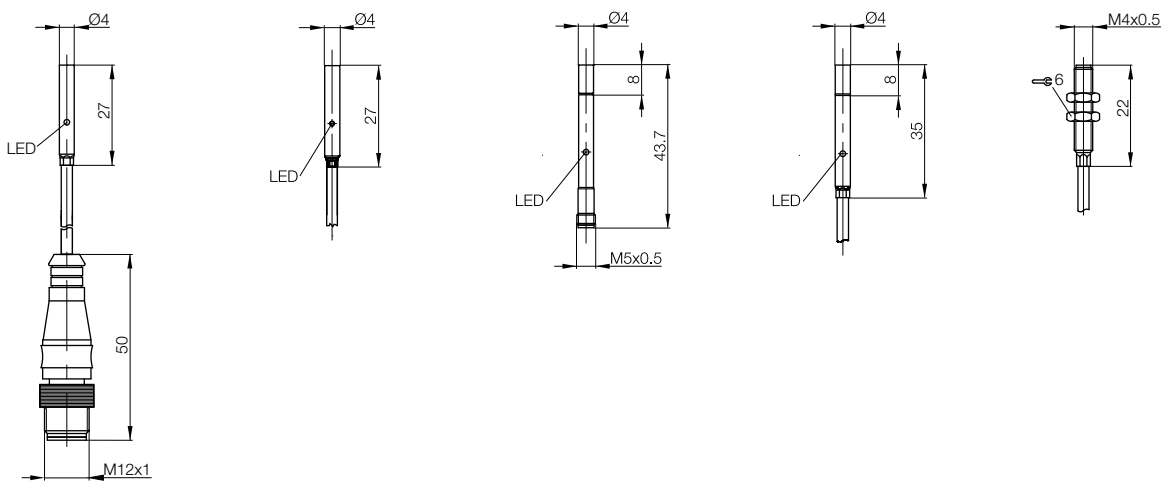
DC 3-/4-wire Inductive Standard Sensors

Cylinder designs, Ø 4 mm, M4x0.5



Ø 4 mm	Ø 4 mm	Ø 4 mm	Ø 4 mm	M4x0.5
Flush	Flush	Not flush	Not flush	Flush
1.5 mm	1.5 mm	5 mm	5 mm	0.6 mm
0...1.2 mm	0...1.2 mm	0...4 mm	0...4 mm	0...0.42 mm
■	■	■■■	■■■	■
BES00JA	BES00J6	BES012K	BES012H	BES01P0
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	BES M04EC-PSD06B-BP02
	BES00K5	BES012E	BES0127	
	BES 516-3017-G-E4-C-PU-02	BES G04ED-POC50F-S26G	BES G04ED-NSC50F-EP02	
	BES00JW	BES0129		
	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	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
3 kHz	3 kHz	3 kHz	3 kHz	2 kHz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	No
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, large switching distance	Narrow design, large switching distance	Narrow design
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
PBT	PBT	PET-C	PET-C	POM
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	2 m PUR cable, 3x0.1 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
Analog distance measurement
Special properties
Special accessories



DC 3-/4-wire Inductive Standard Sensors

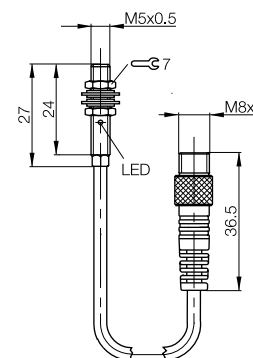
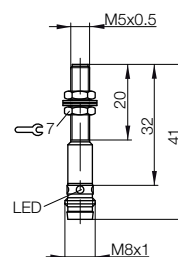
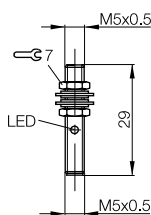
Cylinder design, M5x0.5



Series		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		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 M05ECa-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_B		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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

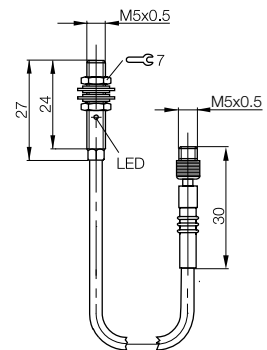
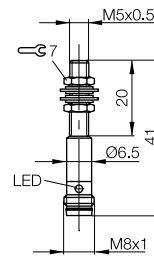
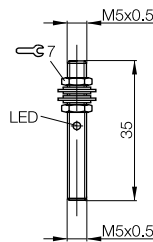
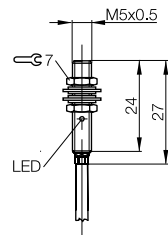
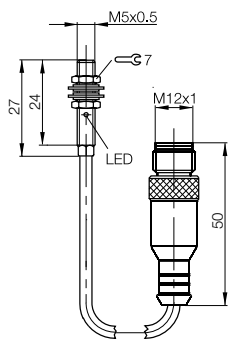
Additional cable lengths and PUR cable jacket material available on request.



DC 3-/4-wire Inductive Standard Sensors Cylinder design, M5x0.5



M5x0.5	M5x0.5	M5x0.5	M5x0.5	M5x0.5	M5x0.5	Inductive sensors
Flush	Flush	Flush	Flush	Flush	Flush	Global DC 3-wire
0.8 mm	0.8 mm	1.5 mm	1.5 mm	1.5 mm	1.5 mm	DC 3-/4-wire
0...0.65 mm	0...0.65 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm	Cylinder designs
■	■	■ ■	■ ■	■ ■	■ ■	Block designs
BES00FW	BES00FT	BES013A	BES00HF	BES00H5		DC 2-wire
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		AC/DC 2-wire
	BES00KZ	BES0137				AC 2-wire
	BES 516-3022-E4-C-PU-02	BES M05ED-POC15B-S26G				Analog distance measurement
	BES00HJ	BES0133				Special properties
	BES 516-3006-E4-C-PU-02	BES M05ED-NSC15B-S26G				Special accessories
	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	10...30 V DC	
3 V	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	75 V DC	
100 mA	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	Yes/Yes/Yes	
-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	
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, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus	
Narrow design	Narrow design	Narrow design	Narrow design	Narrow design	Narrow design	
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel	
PBT	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	M8 connector, 3-pin	0.3 m PUR cable with M5 connector, 4-pin	



DC 3-/4-wire Inductive Standard Sensors

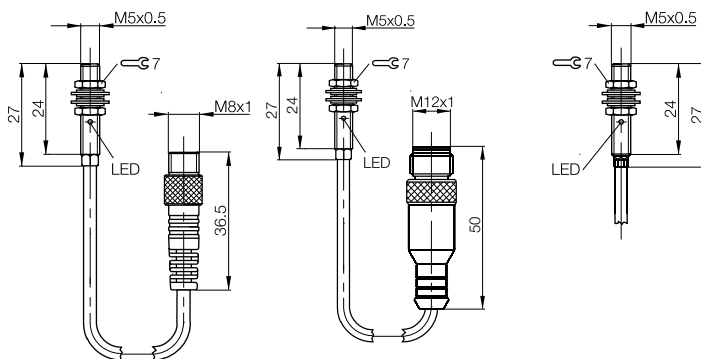
Cylinder design, M5x0.5



Series		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		1.5 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_B		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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

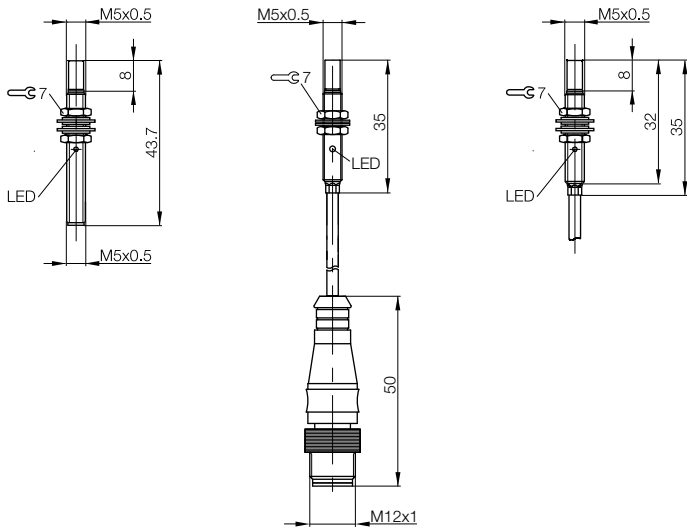
Additional cable lengths and PUR cable jacket material available on request.



DC 3-/4-wire Inductive Standard Sensors Cylinder design, M5x0.5



	M5x0.5	M5x0.5	M5x0.5		
	Not flush	Not flush	Not flush		Inductive sensors
	5 mm	5 mm	5 mm		Global DC 3-wire
	0...4 mm	0...4 mm	0...4 mm		DC 3-/4-wire
	■■■	■■■	■■■		Cylinder designs
	BES013H	BES013C	BES013E		Block designs
	BES M05ED-PSC50F-S26G	BES M05ED-PSC50F-EP00,3-GS04	BES M05ED-PSC50F-EP02		DC 2-wire
	BES0139				AC/DC 2-wire
	BES M05ED-POC50F-S26G				AC 2-wire
	BES0136		BES0134		Analog distance measurement
	BES M05ED-NSC50F-S26G		BES M05ED-NSC50F-EP02		Special properties
	BES0132				Special accessories
	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		



DC 3-/4-wire Inductive Standard Sensors

Cylinder design, Ø 6.5 mm



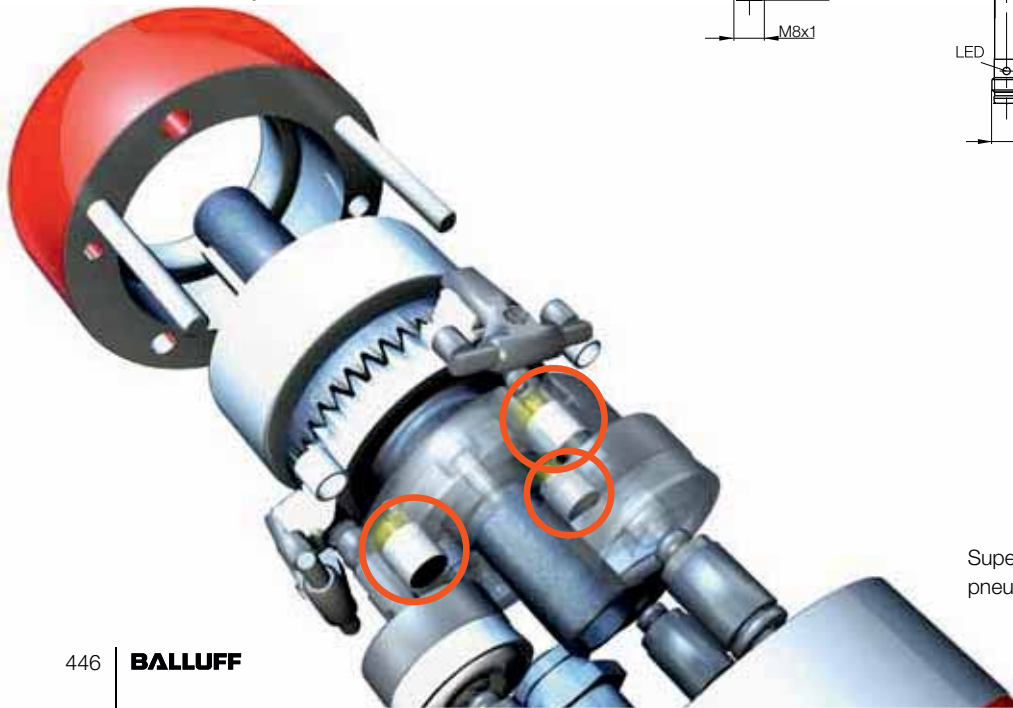
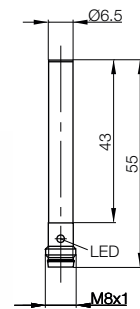
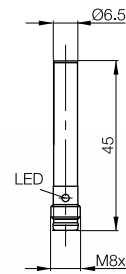
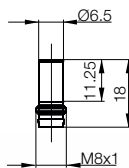
SUPERSHORTIES



Series		Ø 6.5 mm	Ø 6.5 mm	Ø 6.5 mm
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
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_B		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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

Additional cable lengths and PUR cable jacket material available on request



SuperShorties monitor the function of a pneumatic stepping motor.

For more information, visit us online!

DC 3-/4-wire Inductive Standard Sensors

Cylinder design, Ø 6.5 mm



Inductive sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder designs
Block designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Analog distance measurement
Special properties
Special accessories



SUPERSHORTIES

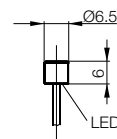
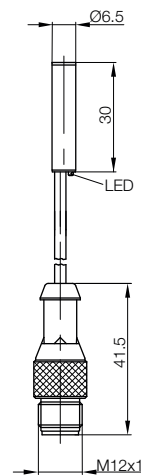
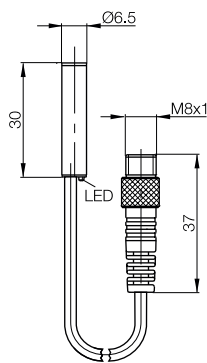
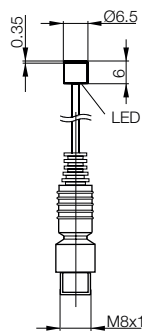
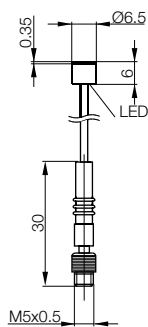


SUPERSHORTIES



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



DC 3-/4-wire Inductive Standard Sensors

Cylinder design, Ø 6.5 mm



SUPERSHORTIES



SUPERSHORTIES

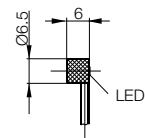
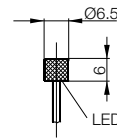
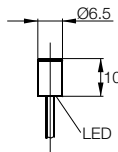


SUPERSHORTIES

Series		Ø 6.5 mm	Ø 6.5 mm	Ø 6.5 mm
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
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_B		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		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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



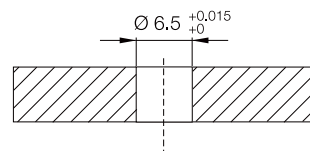
Features

- 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.



DC 3-/4-wire Inductive Standard Sensors

Cylinder design, Ø 6.5 mm

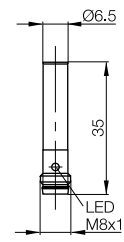
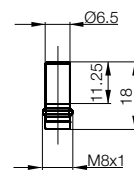
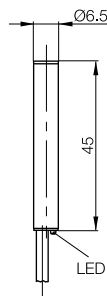
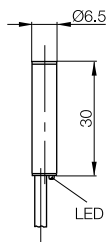
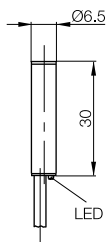


- Inductive sensors
- Global DC 3-wire
- DC 3-/4-wire
- Cylinder designs
- Block designs
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Analog distance measurement
- Special properties
- Special accessories

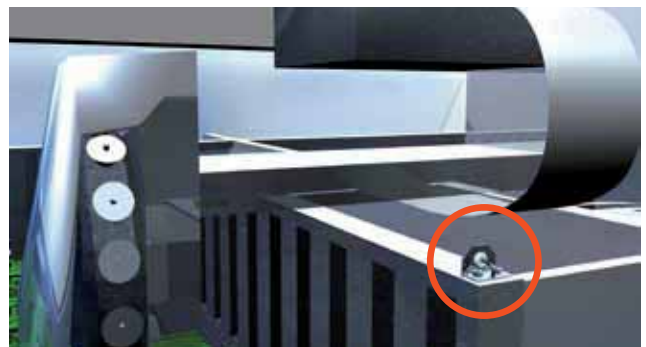
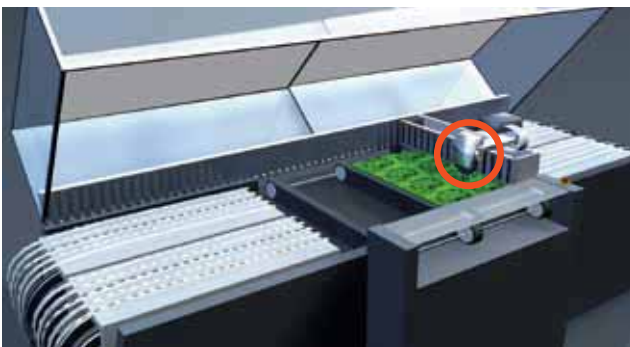


SUPERSHORTIES

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
PBT	PBT	PBT	Stainless steel	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	PBT	PBT
			M8 connector, 3-pin	M8 connector, 3-pin



SuperShorties in electronics production: SMT placement equipment



DC 3-/4-wire Inductive Standard Sensors

Cylinder design, Ø 6.5 mm

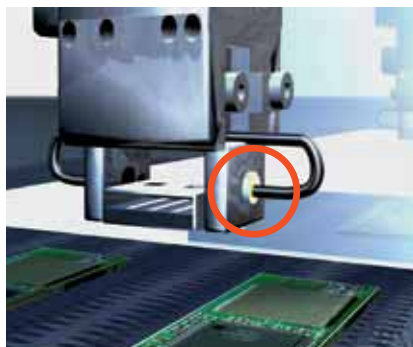
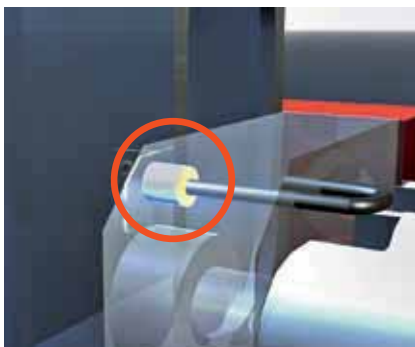
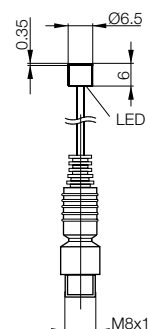
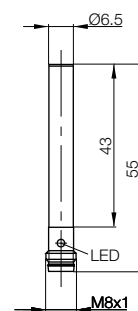
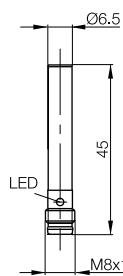


SUPERSHORTIES

Series		Ø 6.5 mm	Ø 6.5 mm	Ø 6.5 mm
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		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_B		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	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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



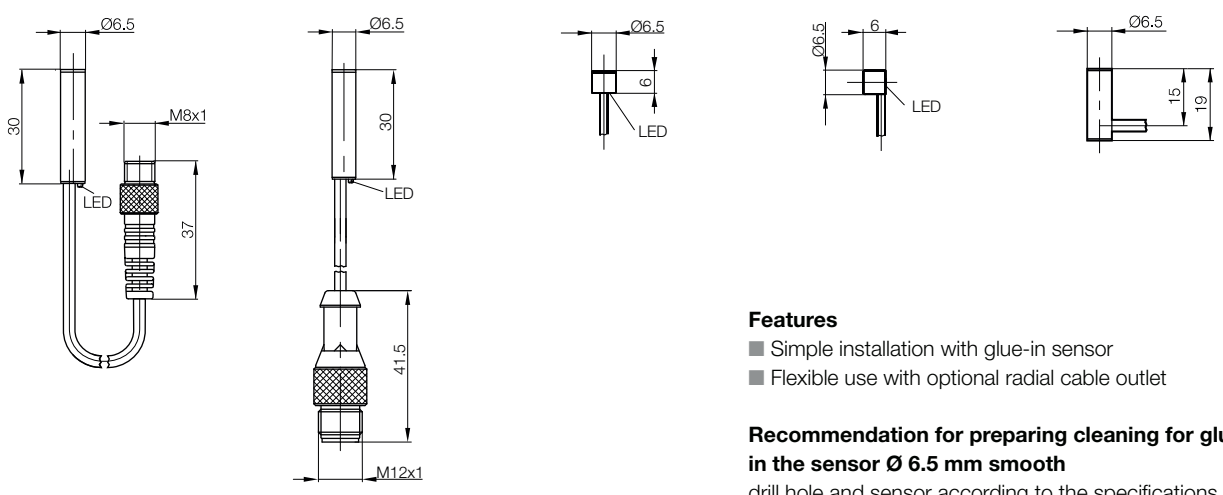
DC 3-/4-wire Inductive Standard Sensors

Cylinder design, Ø 6.5 mm



Inductive sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder designs
Block designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Analog distance measurement
Special properties
Special accessories

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	BES03ZA	BES01KW
BES 516-371-G-E4-C-S49-00,3	BES 516-371-G-E4-C-S4-00,2	BES G06E60-PSC20B-EP02	BES G06K40-PSC20B-FP02	BES 516-371-SA13-PU-02
BES03F8	BES00KU			
BES 516-3021-G-E4-C-S49-00,3	BES 516-3021-G-E4-C-S4-00,2			
BES0106		BES0250		
BES 516-372-G-E4-C-S49-00,3		BES G06E60-NSC20B-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
250 V AC (□)	250 V AC (□)	75 V DC	75 V DC	75 V DC
200 mA	200 mA	150 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
1.5 kHz	1.5 kHz	3 kHz	1.5 kHz	2 kHz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	No
IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 67	IP 65	IP 65
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE
		short design	short design	
Stainless steel	Stainless steel	Stainless steel	PBT	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, 3x0.073 mm ²	2 m PUR cable, 3x0.073 mm ²	2 m PUR cable, 3x0.14 mm ²

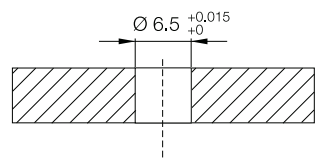


Features

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

Recommendation for preparing cleaning for gluing in the sensor Ø 6.5 mm smooth

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 data sheet.



DC 3-/4-wire Inductive Standard Sensors

Cylinder design, Ø 6.5 mm



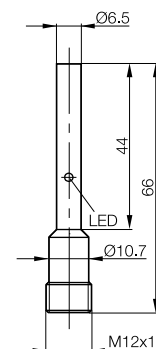
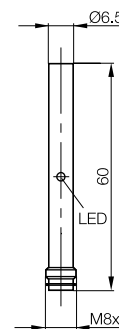
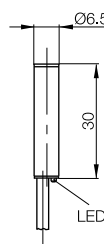
TRIPLEPROX

TRIPLEPROX

Series		Ø 6.5 mm	Ø 6.5 mm	Ø 6.5 mm
Installation type (pay attention to the note in the Basic Information chapter)		Flush	Quasi-flush	Quasi-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	BES00ZF	BES02UY	BES02UR
	Part number	BES 516-371-G-E4-C-02	BES G06MI-PSC30B-S49G	BES G06MH1-PSC30B-S04G
PNP, NC	Ordering code	BES00KP	BES02UW	
	Part number	BES 516-3021-G-E4-C-02	BES G06MI-POC30B-S49G	
NPN, NO	Ordering code	BES0102	BES02UU	BES02UP
	Part number	BES 516-372-G-E4-C-02	BES G06MI-NSC30B-S49G	BES G06MH1-NSC30B-S04G
NPN, NC	Ordering code		BES02UT	
	Part number		BES G06MI-NOC30B-S49G	
Supply voltage U_B		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 (□)	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.		1.5 kHz	1 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 67
Approvals		CE, cULus	CE	CE
Special properties			Large switching distance	Large switching distance
Material	Housing	Stainless steel	Brass-coated	Brass-coated
	Sensing surface	PBT	PBT	PBT
Connection		2 m PVC cable, 3x0.14 mm ²	M8 connector, 3-pin	M12 connector, 4-pin

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



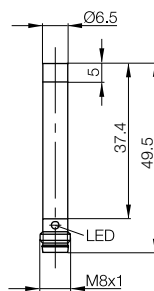
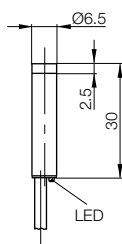
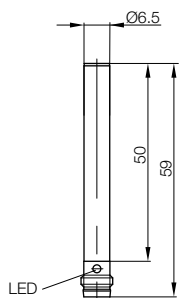


Inductive sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder designs
Block designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Analog distance measurement
Special properties
Special accessories



HYPERPROX

Ø 6.5 mm	Ø 6.5 mm	Ø 6.5 mm		
Quasi-flush	Not flush	Not flush		
4 mm	2.5 mm	4 mm		
0...2.9 mm	0...2 mm	0...3.2 mm		
■■■■	■	■■		
BES01NT	BES00TZ	BES01NP		
BES G06MI-PSC40B-S49G	BES 516-349-E4-C-02	BES G06EF-PSC40F-S49G		
BES01NR	BES00U6			
BES G06MI-NSC40B-S49G	BES 516-350-E4-C-02			
10...30 V DC	10...30 V DC	10...30 V DC		
2.8 V	2.5 V	2.5 V		
75 V DC	250 V AC (□)	75 V DC		
200 mA	200 mA	200 mA		
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes		
0...+60 °C	-25...+70°C	-25...+70°C		
700 Hz	2 kHz	1.5 kHz		
Yellow LED	Yellow LED	Yellow LED		
IP 65	IP 68 per BWN Pr. 20	IP 67		
CE, cULus	CE, cULus	CE, cULus		
Large switching distance				
Brass-coated	Stainless steel	Stainless steel		
PBT	PBT	PBT		
M8 connector, 3-pin	2 m PVC cable, 3x0.14 mm ²	M8 connector, 3-pin		



DC 3-/4-wire Inductive Standard Sensors

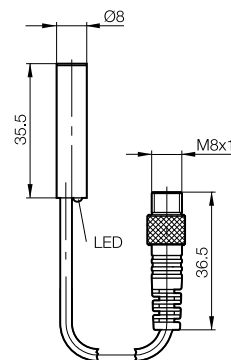
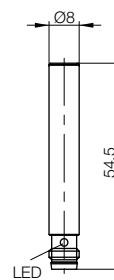
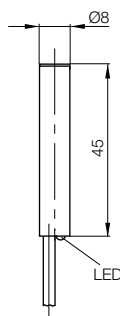
Cylinder designs, Ø 8 mm



Series		Ø 8 mm	Ø 8 mm	Ø 8 mm
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	BES01NY	BES0379	
	Part number	BES G08EG-PSC15B-BV02	BES 516-369-G-SA2-S49-C	
PNP, NC	Ordering code		BES0349	BES0348
	Part number		BES 516-3013-G-SA2-S49-C	BES 516-3013-G-SA2-S49-00,5
NPN, NO	Ordering code			
	Part number			
Supply voltage U_B		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 (Ⓜ)	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	-25...+70°C
Switching frequency f max.		3 kHz	800 Hz	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 67	IP 67
Approvals		CE, cULus	CE, cULus	CE
Special properties				
Material	Housing	Stainless steel	Stainless steel	Stainless steel
	Sensing surface	PBT	PA 12	PA 12
Connection		2 m PVC cable, 3x0.14 mm ²	M8 connector, 3-pin	0.5 m PUR cable with M8 connector, 3-pin

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



DC 3-/4-wire Inductive Standard Sensors

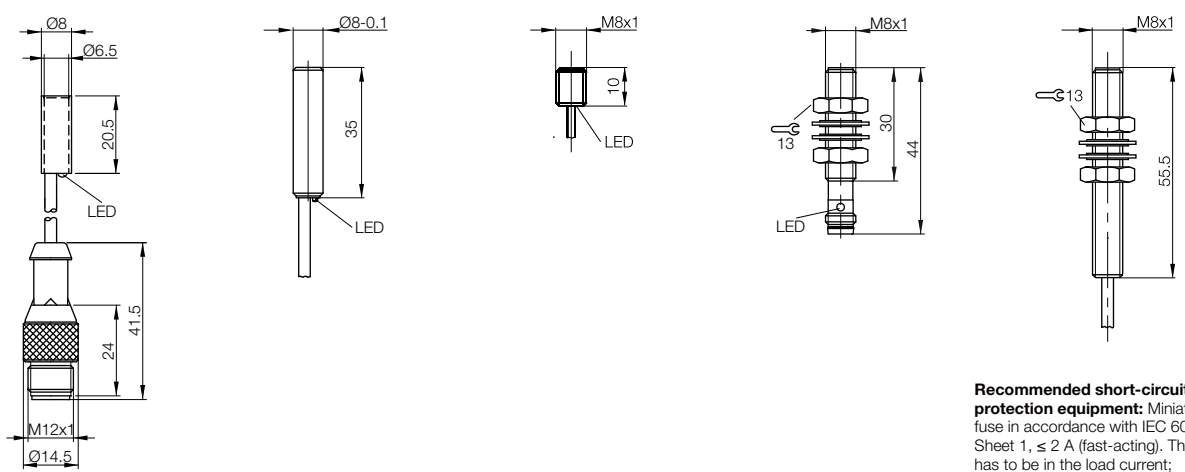
Cylinder designs, Ø 8 mm, M8x1



Inductive sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder designs
Block designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Analog distance measurement
Special properties
Special accessories



Ø 8 mm	Ø 8 mm	M8 x 1	M8 x 1	M8 x 1
Flush	Flush	Flush	Flush	Flush
2 mm	2 mm	0.5 mm	1 mm	1 mm
0...1.6 mm	0...1.6 mm	0...0.36 mm	0...0.8 mm	0...0.8 mm
■ ■	■ ■	■	■	■
BES0388	BES012N	BES03P0		BES02HP
BES G08EC-PSC20B-EP01-GS04-516	BES G08EE-PSC20B-BV02	BES M08EA-PSC05B-EP02		BES 516-324-SA8-02
			BES0367	
			BES 516-343-SA13-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	1.5 V
75 V DC	250 V AC (⊠)	75 V DC	75 V DC	75 V DC
200 mA	200 mA	150 mA	200 mA	200 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/No/No
-25...+70°C	-25...+70°C	-25...85 °C	-25...+70°C	-25...+100 °C
2 kHz	1.5 kHz	2 kHz	3.5 kHz	2 kHz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	No
IP 67	IP 68 per BWN Pr. 20	IP 67	IP 67	IP 67
CE	CE, cULus	CE, cULus	CE, cULus	CE
		short design		
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Ceramic	PBT	PBT	PBT	PBT
1 m PUR cable with M12 connector, 4-pin	2 m PVC cable, 3x0.14 mm ²	2 m PUR cable, 3x0.073 mm ²	M8 connector, 3-pin	2 m PVC cable, 3x0.14 mm ²



Recommended short-circuit protection equipment: Miniature fuse in accordance with IEC 60127-2 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 Standard Sensors Cylinder designs, M8x1



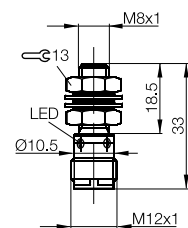
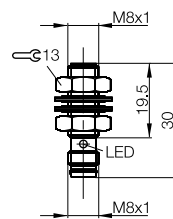
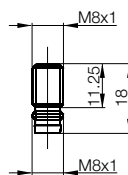
SUPERSHORTIES



Series		M8 x 1	M8 x 1	M8 x 1
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
Switching distance marking		■	■	■
PNP, NO	Ordering code	BES0277	BES013N	BES013M
	Part number	BES M08EA-PSD15B-S49G	BES M08EC-PSC15B-S49G	BES M08EC-PSC15B-S04G
PNP, NC	Ordering code	BES0270	BES013K	
	Part number	BES M08EA-POD15B-S49G	BES M08EC-POC15B-S49G	
NPN, NO	Ordering code	BES026W	BES013J	
	Part number	BES M08EA-NSD15B-S49G	BES M08EC-NSC15B-S49G	
NPN, NC	Ordering code	BES026R		
	Part number	BES M08EA-NOD15B-S49G		
Supply voltage U_B		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	250 V AC (□)	250 V AC (□)
Rated operating current I_e		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 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
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	M12 connector, 4-pin

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

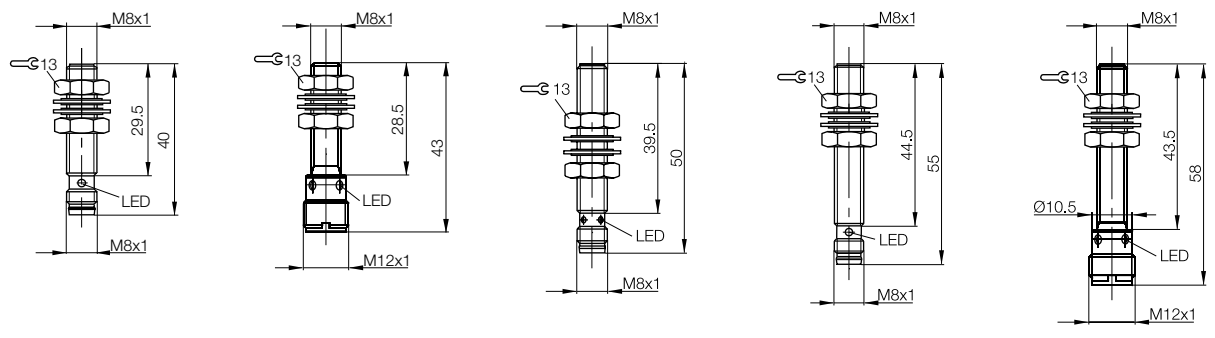
Additional cable lengths and PUR cable jacket material available on request.





M8 x 1	M8 x 1	M8 x 1	M8 x 1	M8 x 1
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
■	■	■	■	■
BES0147	BES0146	BES01P7	BES01AW	BES01PF
BES M08EE-PSC15B-S49G	BES M08EE-PSC15B-S04G	BES M08EG-PSC15B-S49G	BES 516-324-S49-C	BES M08EH-PSC15B-S04G
BES0143	BES0142		BES01LR	BES01PE
BES M08EE-POC15B-S49G	BES M08EE-POC15B-S04G		BES 516-377-S49-C	BES M08EH-POC15B-S04G
BES013Z	BES013Y		BES01F5	BES01PC
BES M08EE-NSC15B-S49G	BES M08EE-NSC15B-S04G		BES 516-343-S49-C	BES M08EH-NSC15B-S04G
BES013T	BES013R		BES01LZ	BES01PA
BES M08EE-NOC15B-S49G	BES M08EE-NOC15B-S04G		BES 516-378-S49-C	BES M08EH-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
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
3 kHz	3 kHz	3 kHz	3 kHz	3 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 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
PBT	PBT	PBT	PBT	PBT
M8 connector, 3-pin	M12 connector, 4-pin	M8 connector, 3-pin	M8 connector, 3-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
Analog distance measurement
Special properties
Special accessories



DC 3-/4-wire Inductive Standard Sensors Cylinder designs, M8x1



SUPERSHORTIES



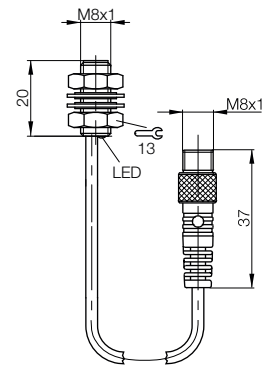
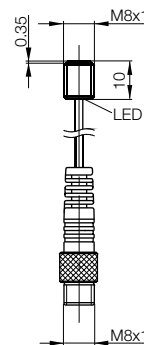
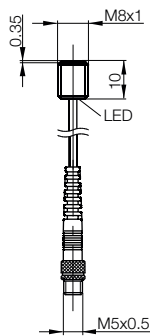
SUPERSHORTIES



Series		M8 x 1	M8 x 1	M8 x 1
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
Switching distance marking		■	■	■
PNP, NO	Ordering code	BES0272	BES0273	BES034Y
	Part number	BES M08EA-PSC15B-EP00,3-GS26	BES M08EA-PSC15B-EP00,3-GS49	BES 516-324-SA44-C-S49-00,3
PNP, NC	Ordering code			
	Part number			
NPN, NO	Ordering code		BES026T	
	Part number		BES M08EA-NSC15B-EP00,3-GS49	
Supply voltage U_B		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		150 mA	150 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	4 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		short design	short design	
Material	Housing	Stainless steel	Stainless steel	Stainless steel
	Sensing surface	PBT	PBT	PBT
Connection		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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



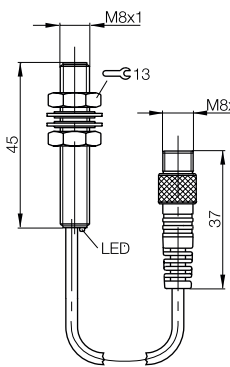
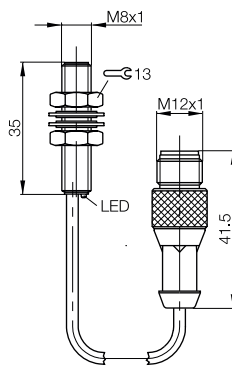
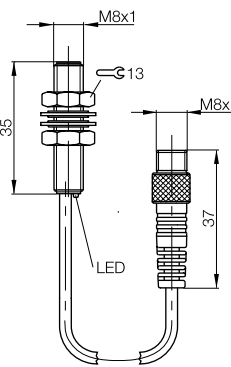
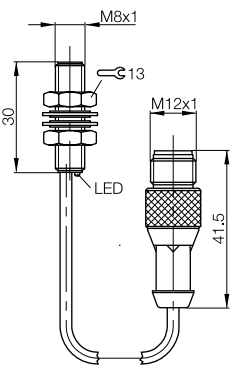
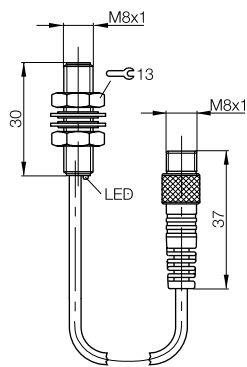
DC 3-/4-wire Inductive Standard Sensors

Cylinder designs, M8x1



M8 x 1	M8 x 1	M8 x 1	M8 x 1	M8 x 1
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
■	■	■	■	■
BES00NK	BES00N9	BES00MU	BES00MT	BES01AL
BES 516-324-E4-C-S49-00,3	BES 516-324-E4-C-S4-00,3	BES 516-324-E3-C-S49-00,3	BES 516-324-E3-C-S4-00,3	BES 516-324-E0-C-S49-00,3
			BES010N	BES01LN
			BES 516-377-E3-C-S4-PU-00,3	BES 516-377-E0-C-S49-00,3
				BES01F4
				BES 516-343-E0-C-S49-00,3
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 (□)	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
3 kHz	3 kHz	3 kHz	3 kHz	3 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 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
PBT	PBT	PBT	PBT	PBT
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	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
Analog distance measurement
Special properties
Special accessories



DC 3-/4-wire Inductive Standard Sensors

Cylinder designs, M8x1



SUPERSHORTIES



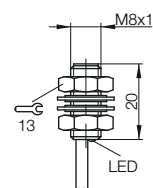
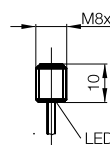
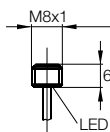
SUPERSHORTIES



Series		M8 x 1	M8 x 1	M8 x 1
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
Switching distance marking		■	■	■
PNP, NO	Ordering code	BES026M	BES0275	BES034P
	Part number	BES M08E60-PSC15B-EP02	BES M08EA-PSC15B-EP02	BES 516-324-SA44-C-02
PNP, NC	Ordering code	BES026K	BES026Y	
	Part number	BES M08E60-POC15B-EP02	BES M08EA-POC15B-EP02	
NPN, NO	Ordering code	BES026J	BES026U	
	Part number	BES M08E60-NSC15B-EP02	BES M08EA-NSC15B-EP02	
NPN, NC	Ordering code	BES026H	BES026N	
	Part number	BES M08E60-NOC15B-EP02	BES M08EA-NOC15B-EP02	
Supply voltage U_B		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		150 mA	150 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	4 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		short design	short design	
Material	Housing	Stainless steel	Stainless steel	Stainless steel
	Sensing surface	PBT	PBT	PBT
Connection		2 m PUR cable, 3x0.073 mm ²	2 m PUR cable, 3x0.073 mm ²	2 m PVC cable, 3x0.14 mm ²

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



DC 3-/4-wire Inductive Standard Sensors

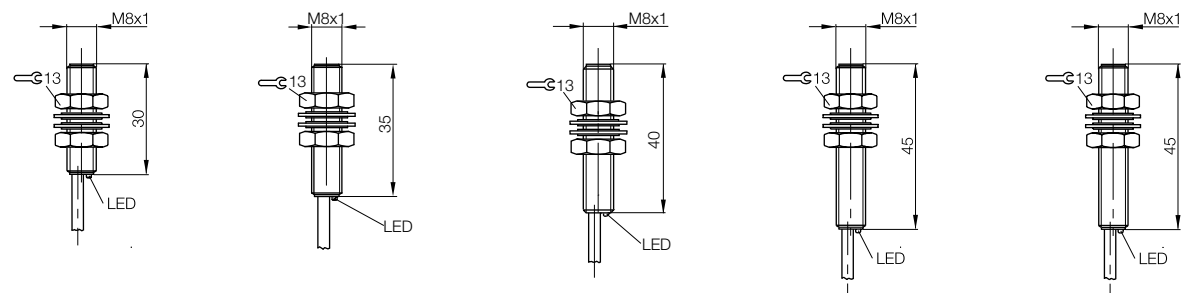
Cylinder designs, M8x1



Inductive sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder designs
Block designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Analog distance measurement
Special properties
Special accessories



M8 x 1	M8 x 1	M8 x 1	M8 x 1	M8 x 1
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
■	■	■	■	■
BES00MY		BES014K	BES01A7	BES01AC
BES 516-324-E4-C-02		BES M08EF-PSC15B-BP02	BES 516-324-EO-C-02	BES 516-324-EO-C-PU-02
BES010T	BES010K	BES014H	BES01LC	BES01LH
BES 516-377-E4-C-02	BES 516-377-E3-C-PU-02	BES M08EF-POC15B-BP02	BES 516-377-EO-C-02	BES 516-377-EO-C-PU-02
BES00TL		BES03J6	BES01EY	BES01F1
BES 516-343-E4-C-02		BES M08EF-NSC15B-BP02	BES 516-343-EO-C-02	BES 516-343-EO-C-PU-02
		BES014C	BES01LT	
		BES M08EF-NOC15B-BP02	BES 516-378-EO-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 (□)	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
3 kHz	3 kHz	3 kHz	3 kHz	3 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 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
PBT	PBT	PBT	PBT	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



DC 3-/4-wire Inductive Standard Sensors Cylinder designs, M8x1



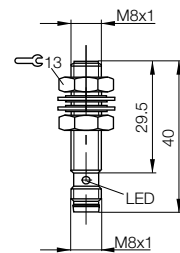
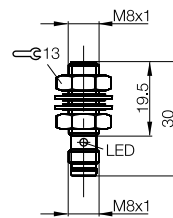
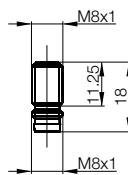
SUPERSHORTIES



Series		M8 x 1	M8 x 1	M8 x 1
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		0...1.6 mm	0...1.6 mm	0...1.6 mm
Switching distance marking		■ ■	■ ■	■ ■
PNP, NO	Ordering code	BES0278	BES013P	BES014A
	Part number	BES M08EA-PSD20B-S49G	BES M08EC-PSC20B-S49G	BES M08EE-PSC20B-S49G
PNP, NC	Ordering code		BES013L	BES0145
	Part number		BES M08EC-POC20B-S49G	BES M08EE-POC20B-S49G
NPN, NO	Ordering code	BES01P1		BES0141
	Part number	BES M08EA-NSD20B-S49G		BES M08EE-NSC20B-S49G
NPN, NC	Ordering code			BES013W
	Part number			BES M08EE-NOC20B-S49G
Supply voltage U_B		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	250 V AC (□)	250 V AC (□)
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	1.5 kHz	1.5 kHz
Output function indicator		No	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
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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



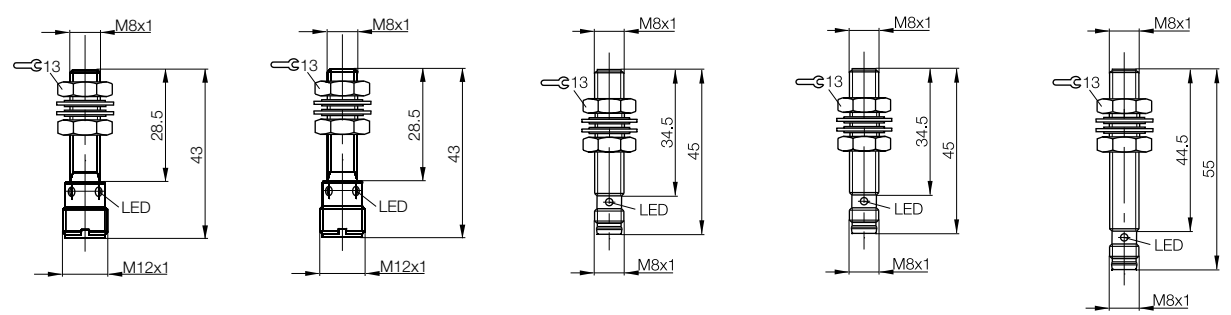
DC 3-/4-wire Inductive Standard Sensors

Cylinder designs, M8x1



Inductive sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder designs
Block designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Analog distance measurement
Special properties
Special accessories

M8 x 1 Flush 2 mm 0...1.6 mm ■■	M8 x 1 Flush 2 mm 0...1.4 mm ■■	M8 x 1 Flush 2 mm 0...1.6 mm ■■	M8 x 1 Flush 2 mm 0...1.4 mm ■■	M8 x 1 Flush 2 mm 0...1.6 mm ■■
BES0148 BES M08EE-PSC20B-S04G	BES0149 BES M08EE-PSC20B-S04G-101	BES00P7 BES 516-324-G-E5-C-S49	BES02P0 BES 516-324-SA96-G-E5-C-S49	BES01AU BES 516-324-G-S49-C
BES0144 BES M08EE-POC20B-S04G		BES0113 BES 516-377-G-E5-C-S49		BES01LP BES 516-377-G-S49-C
BES0140 BES M08EE-NSC20B-S04G		BES00TY BES 516-343-G-E5-C-S49	BES02P1 BES 516-343-SA96-G-E5-C-S49	
BES013U BES M08EE-NOC20B-S04G		BES0118 BES 516-378-G-E5-C-S49		
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 M12 connector, 4-pin	Stainless steel With ceramic coating M12 connector, 4-pin	Stainless steel PBT M8 connector, 3-pin	Stainless steel with ceramic coating M8 connector, 3-pin	Stainless steel PBT M8 connector, 3-pin



DC 3-/4-wire Inductive Standard Sensors Cylinder designs, M8x1

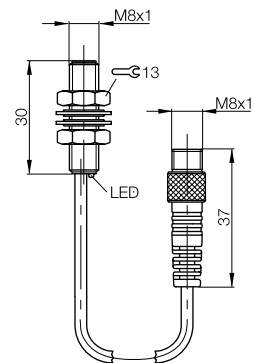
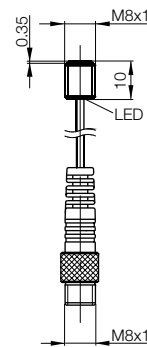
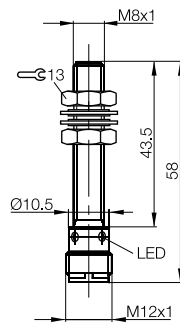


SUPERSHORTIES

Series		M8 x 1	M8 x 1	M8 x 1
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		0...1.6 mm	0...1.6 mm	0...1.6 mm
Switching distance marking		■ ■	■ ■	■ ■
PNP, NO	Ordering code	BES01PH	BES0276	BES00P4
	Part number	BES M08EH-PSC20B-S04G	BES M08EA-PSC20B-EP00,3-GS49	BES 516-324-G-E4-C-S49-00,3
PNP, NC	Ordering code			BES0112
	Part number			BES 516-377-G-E4-C-S49-00,3
NPN, NC	Ordering code			
	Part number			
Supply voltage U_B		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	150 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	3 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, cULus	CE, cULus
Special properties			short design	
Material	Housing	Stainless steel	Stainless steel	Stainless steel
	Sensing surface	PBT	PBT	PBT
Connection		M12 connector, 4-pin	0.3 m PUR cable with M8 connector, 3-pin	0.3 m PUR cable with M8 connector, 3-pin

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



DC 3-/4-wire Inductive Standard Sensors Cylinder designs, M8x1

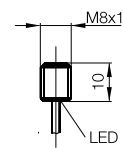
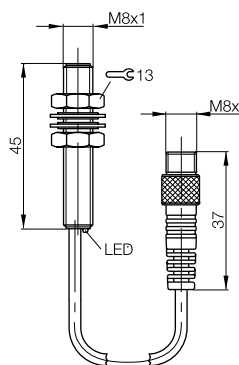
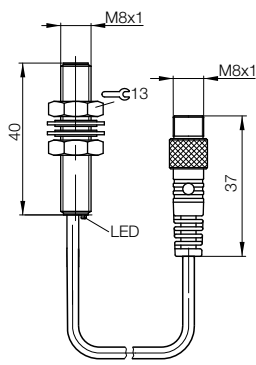
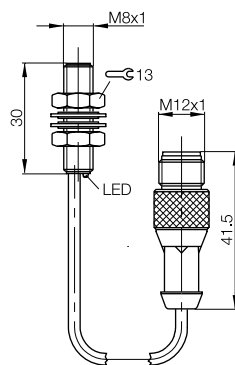
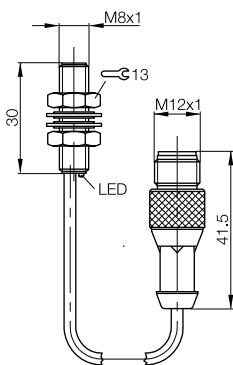


- Inductive sensors
- Global DC 3-wire
- DC 3-/4-wire
- Cylinder designs
- Block designs
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Analog distance measurement
- Special properties
- Special accessories



SUPERSHORTIES

M8 x 1	M8 x 1	M8 x 1	M8 x 1	M8 x 1
Flush	Flush	Flush	Flush	Flush
2 mm	2 mm	2 mm	2 mm	2 mm
0...1.6 mm	0...1.4 mm	0...1.6 mm	0...1.6 mm	0...1.6 mm
■ ■	■ ■	■ ■	■ ■	■ ■
BES00P2	BES02P5	BES03TU	BES01AT	BES026Z
BES 516-324-G-E4-C-S4-00,3	BES 516-324-SA96-G-E4-C-S4-00,3	BES M08EF-PSC20B-BP00,3-GS49	BES 516-324-G-EO-C-S49-01	BES M08EA-POC20B-EP02
				BES026P
				BES M08EA-NOC20B-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
250 V AC (□)	250 V AC (□)	250 V AC (□)	250 V AC (□)	75 V DC
200 mA	200 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
1.5 kHz	1.5 kHz	1.5 kHz	1.5 kHz	3 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 68 per BWN Pr. 20	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
				short design
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
PBT	with ceramic coating	PBT	PBT	PBT
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 M8 connector, 3-pin	1 m PUR cable with M8 connector, 3-pin	2 m PUR cable, 3x0.073 mm ²



DC 3-/4-wire Inductive Standard Sensors

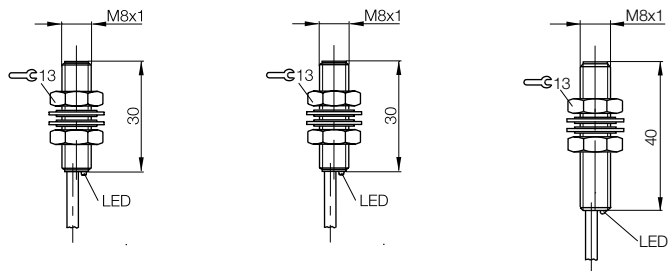
Cylinder designs, M8x1



Series		M8 x 1	M8 x 1	M8 x 1
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		0...1.6 mm	0...1.6 mm	0...1.6 mm
Switching distance marking		■ ■	■ ■	■ ■
PNP, NO	Ordering code	BES00NR	BES00NY	BES014L
	Part number	BES 516-324-G-E4-C-02	BES 516-324-G-E4-C-PU-02	BES M08EF-PSC20B-BP02
PNP, NC	Ordering code	BES010Y	BES010Z	BES014J
	Part number	BES 516-377-G-E4-C-02	BES 516-377-G-E4-C-PU-02	BES M08EF-POC20B-BP02
NPN, NO	Ordering code	BES00TT		BES014F
	Part number	BES 516-343-G-E4-C-02		BES M08EF-NSC20B-BP02
NPN, NC	Ordering code	BES0116		BES014E
	Part number	BES 516-378-G-E4-C-02		BES M08EF-NOC20B-BP02
Supply voltage U_B		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	PBT	PBT
Connection		2 m PVC cable, 3x0.14 mm ²	2 m PUR cable, 3x0.14 mm ²	2 m PUR cable, 3x0.14 mm ²

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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





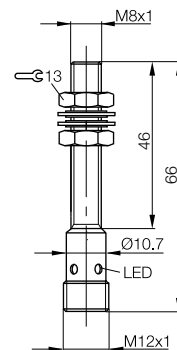
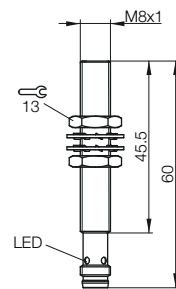
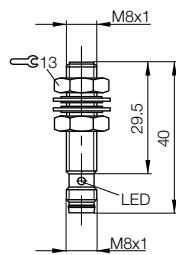
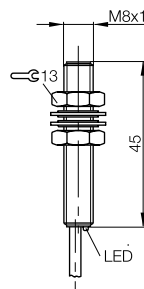
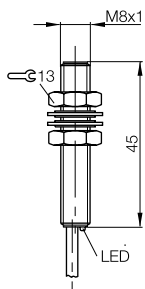
TRIPLEPROX

TRIPLEPROX



M8 x 1	M8 x 1	M8 x 1	M8 x 1	M8 x 1
Flush	Flush	Flush	Quasi-flush	Quasi-flush
2 mm	2 mm	2.5 mm	3 mm	3 mm
0...1.6 mm	0...1.6 mm	0...2 mm	0...2.4 mm	0...2.4 mm
■ ■	■ ■	■ ■	■ ■ ■	■ ■ ■
BES01AM	BES01AN	BES0427	BES02WA	BES02W9
BES 516-324-G-EO-C-02	BES 516-324-G-EO-C-PU-02	BES M08EE-PSC25B-S49G	BES M08MH1-PSC30B-S49G	BES M08MH1-PSC30B-S04G
		BES0423		
		BES M08EE-POC25B-S49G		
			BES02W8	BES02W7
			BES M08MH1-NSC30B-S49G	BES M08MH1-NSC30B-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 V	2 V
250 V AC (□)	250 V AC (□)	250 V AC	75 V DC	75 V DC
200 mA	200 mA	100 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	0...+60 °C	-25...+70°C	-25...+70°C
1.5 kHz	1.5 kHz	1 kHz	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 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE	CE
			Large switching distance	Large switching distance
Stainless steel	Stainless steel	Stainless steel	Brass-coated	Brass-coated
PBT	PBT	PBT	PBT	PBT
2 m PVC cable, 3x0.14 mm ²	2 m PUR cable, 3x0.14 mm ²	M8 connector, 3-pin	M8 connector, 3-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
Analog distance measurement
Special properties
Special accessories



DC 3-/4-wire Inductive Standard Sensors

Cylinder designs, M8x1



TRIPLEPROX



HYPERPROX

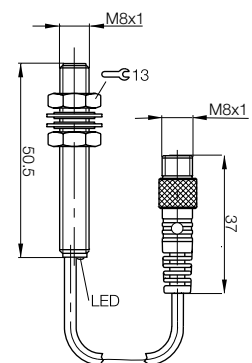
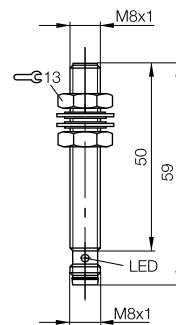
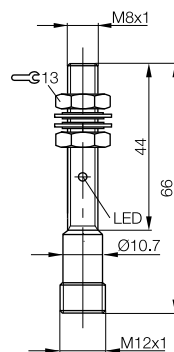


HYPERPROX

Series		M8 x 1	M8 x 1	M8 x 1
Installation type (pay attention to the note in the Basic Information chapter)		Quasi-flush	Quasi-flush	Quasi-flush
Rated switching distance s_n		3 mm	4 mm	4 mm
Assured switching distance s_a		0...2.2 mm	0...2.9 mm	0...2.9 mm
Switching distance marking		■■■	■■■■	■■■■
PNP, NO	Ordering code	BES02PW	BES01ZW	BES003R
	Part number	BES M08MH1-PSC30B-S04G-101	BES M08MI-PSC40B-S49G	BES M08MI-PSC40B-BP00,3-GS49
PNP, NC	Ordering code			
	Part number			
NPN, NO	Ordering code		BES01ZT	
	Part number		BES M08MI-NSC40B-S49G	
Supply voltage U_B		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		2 V	2.8 V	2.8 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	0...+60 °C	0...+60 °C
Switching frequency f max.		1 kHz	800 Hz	800 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, cULus	CE, cULus
Special properties		Large switching distance	Large switching distance	Large switching distance
Material	Housing	Brass-coated	Brass-coated	Brass-coated
	Sensing surface	with ceramic coating	PBT	PBT
Connection		M12 connector, 4-pin	M8 connector, 3-pin	0.3 m PUR cable with M8 connector, 3-pin

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



DC 3-/4-wire Inductive Standard Sensors Cylinder designs, M8x1

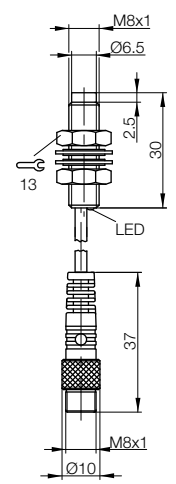
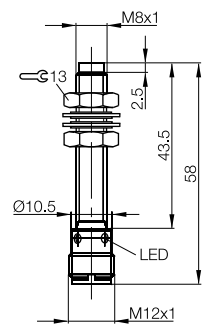
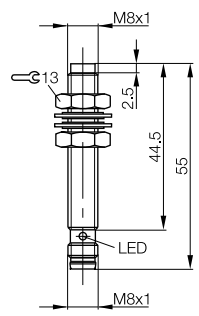
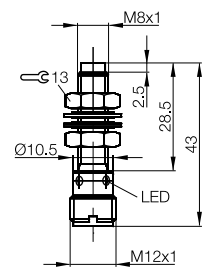
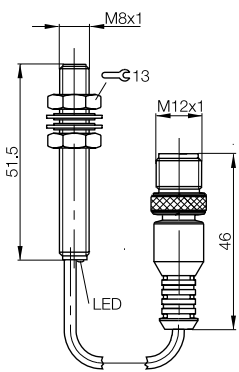


HYPERPROX



M8 x 1 Quasi-flush 4 mm 0...2.9 mm ■■■■	M8 x 1 Not flush 2.5 mm 0...2 mm ■	M8 x 1 Not flush 2.5 mm 0...2 mm ■	M8 x 1 Not flush 2.5 mm 0...2 mm ■	M8 x 1 Not flush 2.5 mm 0...2 mm ■
BES01ZU BES M08MI-PSC40B-BP00,2-GS04	BES01P3 BES M08ED-PSC25F-S04G	BES01M6 BES 516-383-S49-C	BES01P8 BES M08EG-PSC25F-S04G	BES01P6 BES M08EG-POC25F-S04G
BES01ZR BES M08MI-NSC40B-BP00,2-GS04	BES01P2 BES M08ED-NSC25F-S04G		BES01P5 BES M08EG-NSC25F-S04G	BES011U BES 516-384-E4-C-S49-00.2
10...30 V DC 2.8 V 75 V DC 200 mA Yes/Yes/Yes 0...+60 °C 800 Hz Yellow LED IP 67 CE, cULus Large switching distance	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	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 67 CE, cULus
Brass-coated PBT	Stainless steel PBT	Stainless steel PBT	Stainless steel PBT	Stainless steel PBT
0.2 m PUR cable with M12 connector, 4-pin	M12 connector, 4-pin	M8 connector, 3-pin	M12 connector, 4-pin	0.2 m PVC 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
Analog distance measurement
Special properties
Special accessories



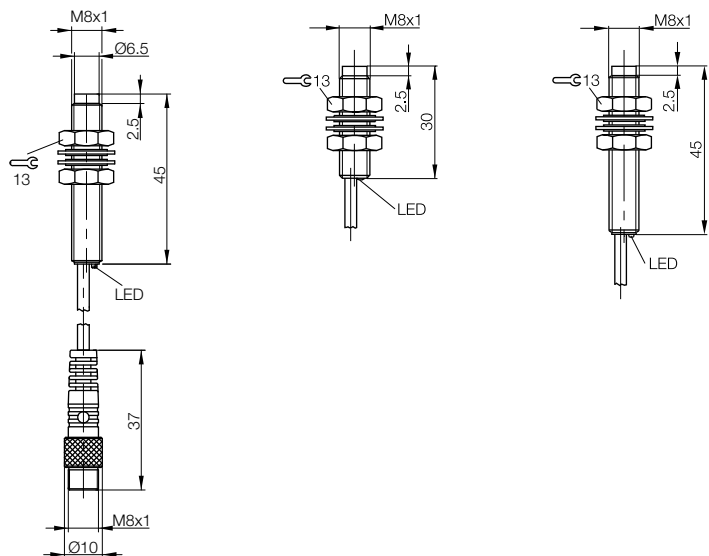
DC 3-/4-wire Inductive Standard Sensors Cylinder designs, M8x1



Series		M8 x 1	M8 x 1	M8 x 1
Installation type (pay attention to the note 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		BES011A	BES01M0
	Part number		BES 516-383-E4-C-02	BES 516-383-EO-C-02
PNP, NC	Ordering code			
	Part number			
NPN, NO	Ordering code	BES01MA	BES011M	BES01M7
	Part number	BES 516-384-EO-C-S49-00.2	BES 516-384-E4-C-02	BES 516-384-EO-C-02
NPN, NC	Ordering code			
	Part number			
Supply voltage U_B		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 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		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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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

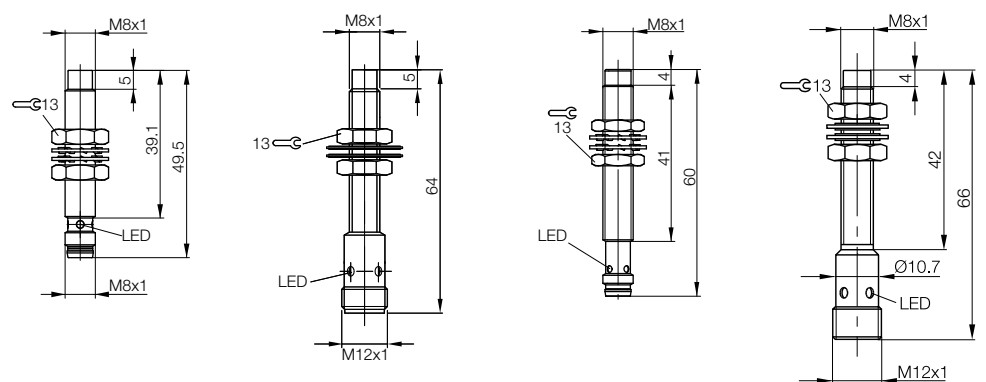




Inductive sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder designs
Block designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Analog distance measurement
Special properties
Special accessories



M8 x 1	M8 x 1	M8 x 1	M8 x 1	
Not flush	Not flush	Not flush	Not flush	
4 mm	4 mm	6 mm	6 mm	
0...3.2 mm	0...3.2 mm	0...4.8 mm	0...4.8 mm	
■ ■	■ ■	■ ■ ■	■ ■ ■	
BES014M	BES01P9	BES02W4	BES02W3	
BES M08EF-PSC40F-S49G	BES M08EG1-PSC40F-S04G	BES M08MG1-PSC60F-S49G	BES M08MG1-PSC60F-S04G	
		BES02W2		
		BES M08MG1-POC60F-S49G		
			BES02W0	
			BES M08MG1-NSC60F-S04G	
		BES02UZ		
		BES M08MG1-NOC60F-S49G		
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	
2.5 V	2.5 V	2 V	2 V	
250 V AC (□)	250 V AC (□)	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	
1.5 kHz	5 kHz	500 Hz	500 Hz	
Yellow LED	Yellow LED	Yellow LED	Yellow LED	
IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 67	IP 67	
CE, cULus	CE, cULus	CE	CE	
		Large switching distance	Large switching distance	
Stainless steel	Stainless steel	Brass-coated	Brass-coated	
PBT	PBT	PBT	PBT	
M8 connector, 3-pin	M12 connector, 4-pin	M8 connector, 3-pin	M12 connector, 4-pin	



DC 3-/4-wire Inductive Standard Sensors

Cylinder design, M12x1

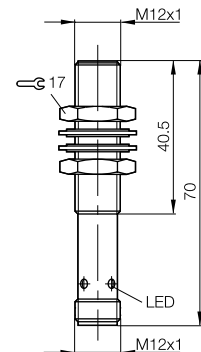
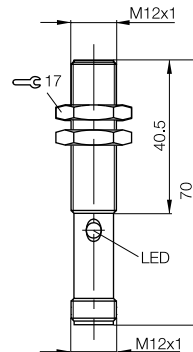
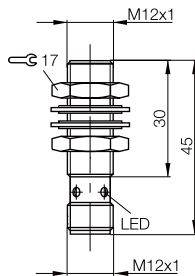


Series		M12x1	M12x1	M12x1	
Installation type (pay attention to the note in the Basic Information chapter)		Flush	Flush	Flush	
Rated switching distance s_n		2 mm	2 mm	2 mm	
Assured switching distance s_a		0...1.6 mm	0...1.6 mm	0...1.6 mm	
Switching distance marking		■	■	■	
PNP, NO	Ordering code	BES00PK	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_B		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	

Connection-Switching diagram, see page 906

The meaning of switching distance markings can be found on page 911

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



DC 3-/4-wire Inductive Standard Sensors

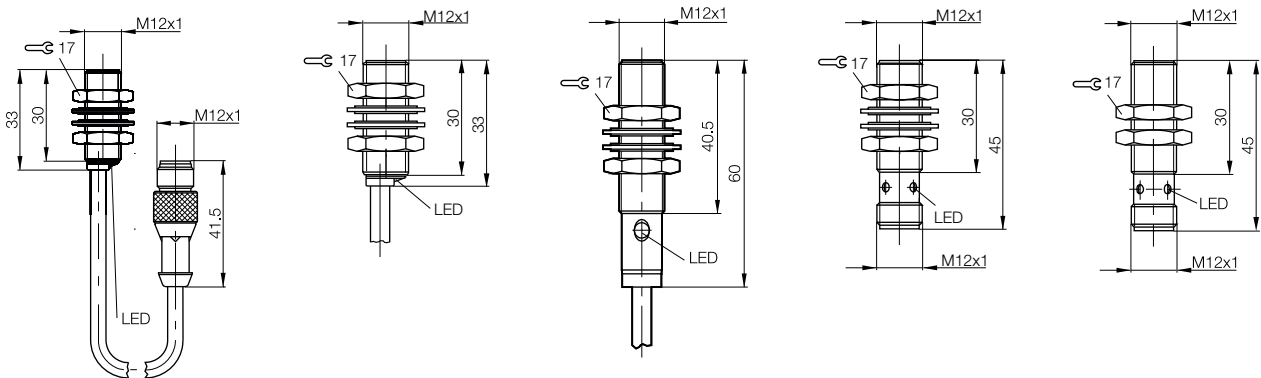
Cylinder design, M12x1



Inductive sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder designs
Block designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Analog distance measurement
Special properties
Special accessories



M12x1	M12x1	M12x1	M12x1	M12x1
Flush	Flush	Flush	Flush	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
■	■	■	■ ■	■ ■
BES00PH	BES00P8	BES01AZ	BES00PY	BES014W
BES 516-325-E4-C-S4-00,5	BES 516-325-E4-C-02	BES 516-325-BO-C-02	BES 516-325-G-E5-C-S4	BES M12EE-PSC40B-S04G
	BES00YL	BES01K2	BES00Z0	BES014U
	BES 516-370-E4-C-02	BES 516-370-BO-C-02	BES 516-370-G-E5-C-S4	BES M12EE-POC40B-S04G
	BES00T0	BES01EF	BES00TC	
	BES 516-329-E4-C-02	BES 516-329-BO-C-02	BES 516-329-G-E5-C-S4	
	BES0108	BES01L7	BES010H	
	BES 516-375-E4-C-02	BES 516-375-BO-C-02	BES 516-375-G-E5-C-S4	
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2 V	2 V	1.5 V	2.5 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
-25...+70°C	-25...+70°C	-40...+85 °C	-25...+70°C	-25...+85 °C
5 kHz	5 kHz	3 kHz	2.5 kHz	2 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 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	Brass-coated	Stainless steel
PBT	PBT	PA 12	LCP	LCP
0.5 m PUR cable with M12 connector, 4-pin	2 m PVC cable, 3x0.34 mm ²	2 m PVC cable, 3x0.34 mm ²	M12 connector, 4-pin	M12 connector, 4-pin



DC 3-/4-wire Inductive Standard Sensors

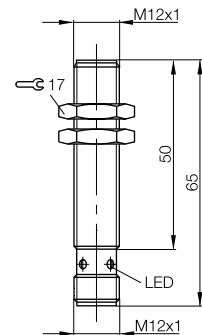
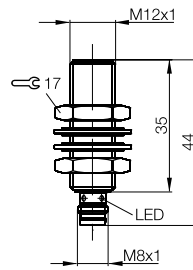
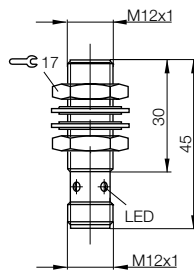
Cylinder design, M12x1



Series	M12x1	M12x1	M12x1	
Installation type (pay attention to the note 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_B	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	

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



DC 3-/4-wire Inductive Standard Sensors

Cylinder design, M12x1

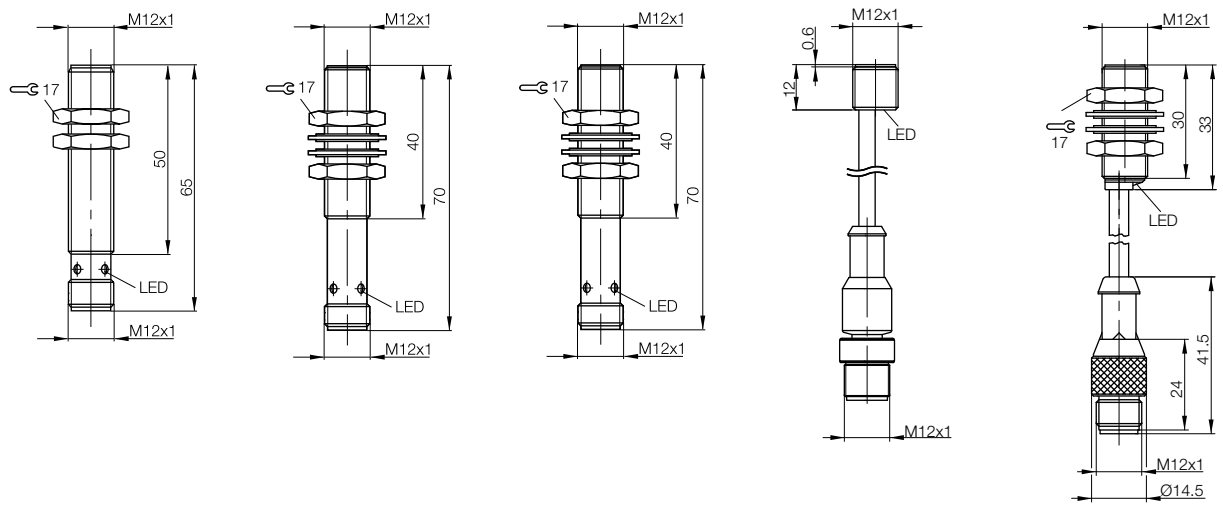


Inductive sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder designs
Block designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Analog distance measurement
Special properties
Special accessories



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



DC 3-/4-wire Inductive Standard Sensors Cylinder design, M12x1

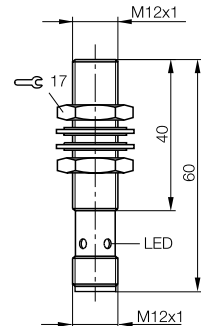
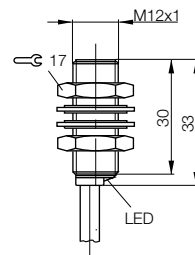
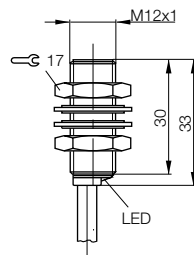


TRIPLEPROX

Series	M12x1	M12x1	M12x1
Installation type (pay attention to the note 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 Part number	BES00PL BES 516-325-G-E4-C-02	BES00PP BES 516-325-G-E4-C-PU-02
PNP, NC	Ordering code Part number	BES00YU BES 516-370-G-E4-C-02	BES00YW BES 516-370-G-E4-C-PU-02
PNP, complementary	Ordering code Part number		
NPN, NO	Ordering code Part number	BES00T6 BES 516-329-G-E4-C-02	BES00T9 BES 516-329-G-E4-C-PU-02
NPN, NC	Ordering code Part number	BES010C BES 516-375-G-E4-C-02	BES010E BES 516-375-G-E4-C-PU-02
Supply voltage U_B	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 Sensing surface	Brass-coated LCP	Brass-coated PBT
Connection	2 m PVC cable, 3x0.34 mm ²	2 m PUR cable, 3x0.34 mm ²	M12 connector, 4-pin

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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





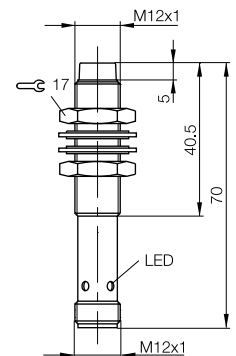
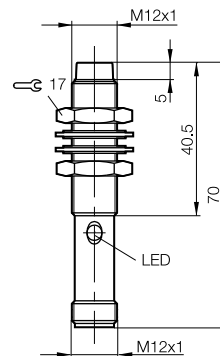
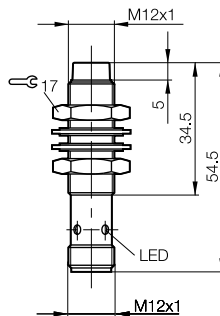
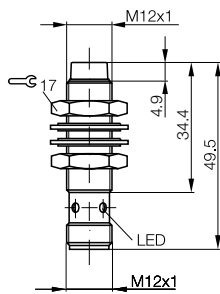
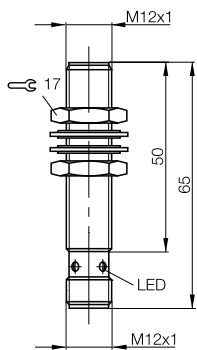
Inductive sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder designs
Block designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Analog distance measurement
Special properties
Special accessories



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



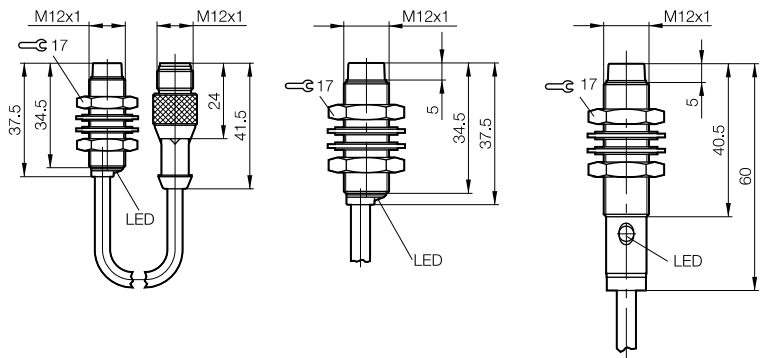
DC 3-/4-wire Inductive Standard Sensors Cylinder design, M12x1



		M12x1	M12x1	M12x1
Series		M12x1	M12x1	M12x1
Installation type (pay attention to the note 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_B		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e 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_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.		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

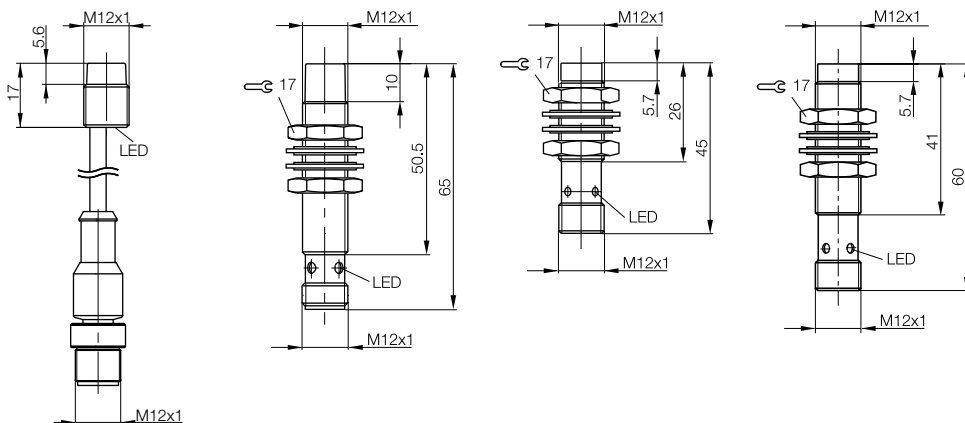
Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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





SUPERSHORTIES		TRIPLEPROX		
M12x1	M12x1	M12x1	M12x1	Inductive sensors
Not flush	Not flush	Not flush	Not flush	
6 mm	8 mm	10 mm	10 mm	Global DC 3-wire
0...4.8 mm	0...6.4 mm	0...8 mm	0...8 mm	
■ ■	■ ■	■ ■ ■	■ ■ ■	DC 3-/4-wire
BES047L	BES01PN	BES02WK	BES02WR	Cylinder designs
BES M12EA-PSC60F-EP00,3-GS04	BES M12EG-PSC80F-S04G	BES M12MC1-PSC10F-S04G	BES M12MF1-PSC10F-S04G	Block designs
BES047M			BES02WP	
BES M12EA-POC60F-EP00,3-GS04			BES M12MF1-POC10F-S04G	DC 2-wire
BES047P		BES02WJ	BES02WN	AC/DC 2-wire
BES M12EA-NSC60F-EP00,3-GS04		BES M12MC1-NSC10F-S04G	BES M12MF1-NSC10F-S04G	AC 2-wire
BES047N				Analog distance measurement
BES M12EA-NOC60F-EP00,3-GS04				Special properties
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	Special accessories
2.5 V	2.5 V	2 V	2 V	
75 V DC	250 V AC (□)	75 V DC	75 V DC	
100 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	
1 kHz	1.5 kHz	400 Hz	400 Hz	
Yellow LED	Yellow LED	Yellow LED	Yellow LED	
IP 67	IP 68 per BWN Pr. 20	IP 67	IP 67	
CE, cULus	CE, cULus	CE	CE	
short design		Large switching distance	Large switching distance	
Stainless steel	Stainless steel	Brass-coated	Brass-coated	
LCP	PBT	PBT	PBT	
0.3 m PUR cable with M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	



DC 3-/4-wire Inductive Standard Sensors

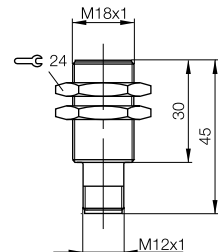
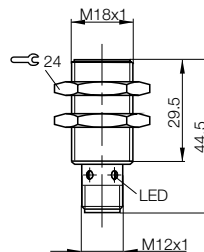
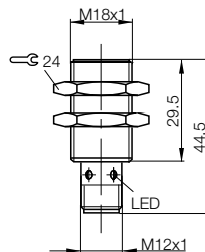
Cylinder design, M18x1



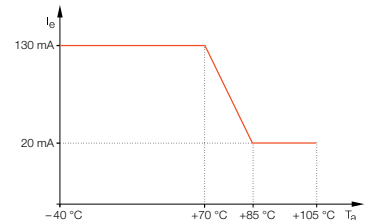
Series		M18x1	M18x1	M18x1
Installation type (pay attention to the note in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		5 mm	5 mm	5 mm
Assured switching distance s_a		0...4 mm	0...4 mm	0...4 mm
Switching distance marking		■	■	■
PNP, NO	Ordering code	BES00R6		BES02ET
	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_B		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_B 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_B		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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



*max. load current over temperature

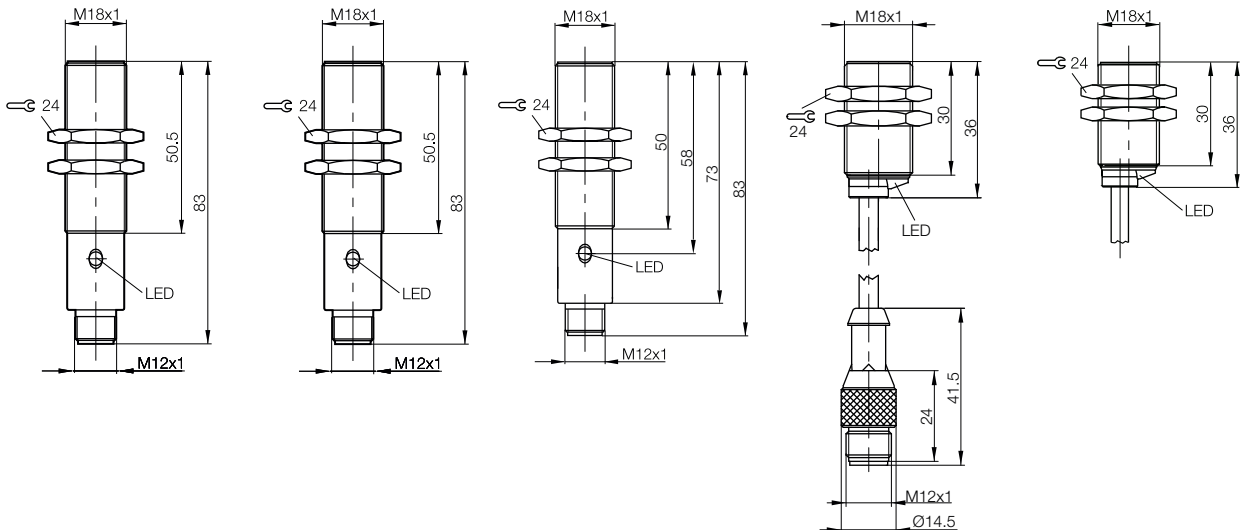


DC 3-/4-wire Inductive Standard Sensors

Cylinder design, M18x1



M18x1	M18x1	M18x1	M18x1	M18x1	M18x1	
Flush	Flush	Flush	Flush	Flush	Flush	Inductive sensors
5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	Global DC 3-wire
0...4 mm	0...4 mm	0...4 mm	0...4 mm	0...4 mm	0...4 mm	
■	■	■	■	■	■	DC 3-/4-wire
BES01CW	BES01CZ	BES02EU	BES00R5	BES00R0		Cylinder designs
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		Block designs
BES01JW						DC 2-wire
BES 516-367-S4-C						AC/DC 2-wire
BES015N						AC 2-wire
BES 516-105-S4-C						
BES01H0						Analog distance measurement
BES 516-355-S4-C						
BES01JU						Special properties
BES 516-366-S4-C						Special accessories
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	10...30 V DC	
2.5 V	1.5 V	1.5 V	2 V	2 V	2 V	
250 V AC (□)	250 V AC (□)	250 V AC (□)	75 V DC	75 V DC	75 V DC	
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	-40...+85 °C	-25...+70°C	-25...+70°C	-25...+70°C	
900 Hz	900 Hz	900 Hz	1 kHz	1 kHz	1 kHz	
Yellow LED	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	IP 67	
CE, cULus	CE	CE, cULus	CE, cULus	CE, cULus	CE, cULus	
Brass-coated	Brass-coated	Stainless steel	Brass-coated	Brass-coated	Brass-coated	
PA 12	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	0.2 m PUR cable with M12 connector, 4-pin	2 m PVC cable, 3x0.34 mm ²	



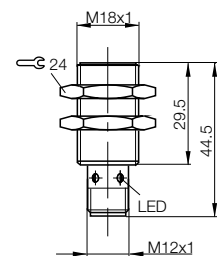
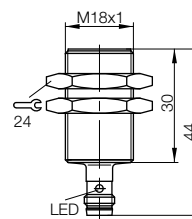
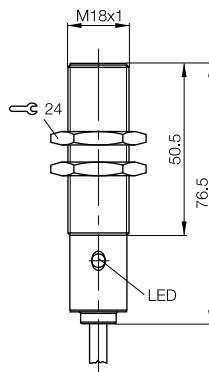
DC 3-/4-wire Inductive Standard Sensors Cylinder design, M18x1



Series		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	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_B		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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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

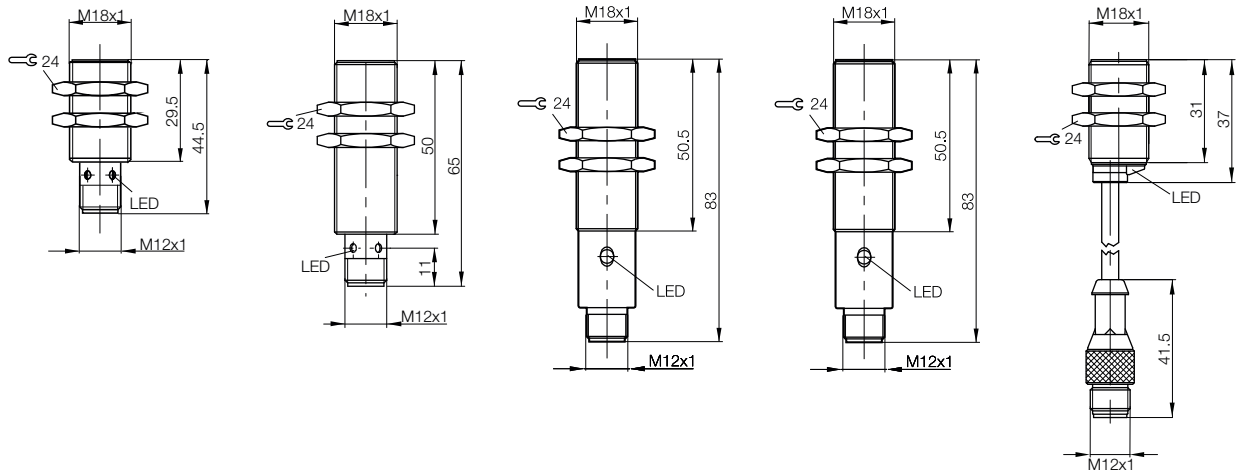


DC 3-/4-wire Inductive Standard Sensors Cylinder design, M18x1



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 with ceramic coating	Stainless steel PBT	Brass-coated PBT	Brass-coated PBT	Brass-coated 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
Analog distance measurement
Special properties
Special accessories



DC 3-/4-wire Inductive Standard Sensors Cylinder design, M18x1



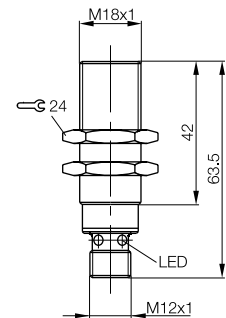
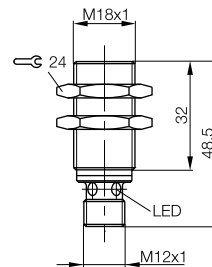
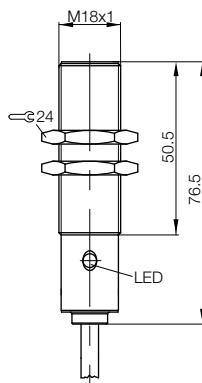
TRIPLEPROX

TRIPLEPROX

Series	M18x1	M18x1	M18x1
Installation type (pay attention to the note 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 Part number	BES02Y5 BES M18MD1-PSC12B-S04G	BES02Y9 BES M18MG1-PSC12B-S04G
PNP, NC	Ordering code Part number		
NPN, NO	Ordering code Part number	BES02Y4 BES M18MD1-NSC12B-S04G	BES02Y8 BES M18MG1-NSC12B-S04G
Supply voltage U_B	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 (Ⓜ)	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 Sensing surface: PA 12	Brass-coated PBT	Brass-coated PBT
Connection	2 m PUR cable, 3x0.34 mm ²	M12 connector, 4-pin	M12 connector, 4-pin

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

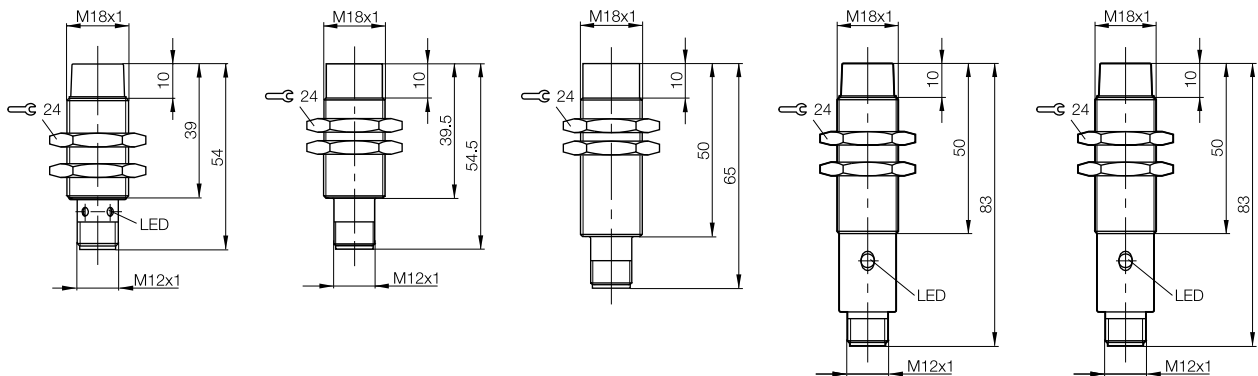
Additional cable lengths and PUR cable jacket material available on request.



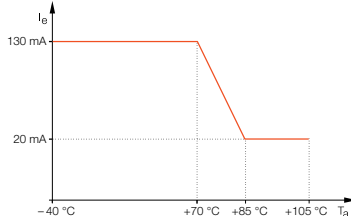


M18x1	M18x1	M18x1	M18x1	M18x1
Not flush	Not flush	Not flush	Not flush	Not flush
8 mm	8 mm	8 mm	8 mm	8 mm
0...6.5 mm	0...6.5 mm	0...6.5 mm	0...6.5 mm	0...6.5 mm
■	■	■	■	■
BES00WM	BES02FK	BES02FM	BES03AW	BES01HY
BES 516-360-E5-Y-S4	BES 515-360-E5-T-S4	BES 515-360-SA12-S4-T	BES 516-360-S4-L	BES 516-360-S4-C
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
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
Analog distance measurement
Special properties
Special accessories



*max. load current over temperature



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

DC 3-/4-wire Inductive Standard Sensors

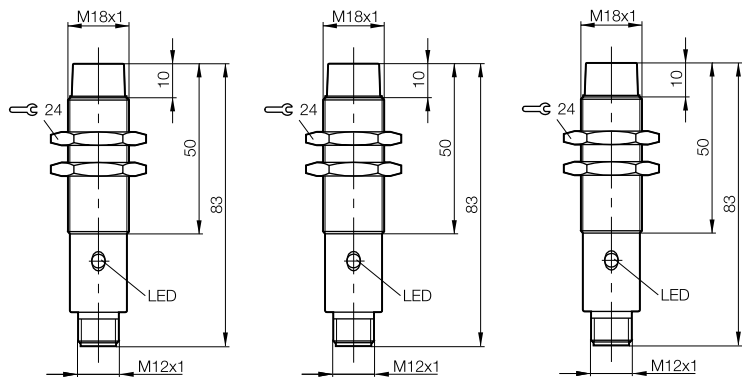
Cylinder design, M18x1



Series		M18x1	M18x1	M18x1
Installation type (pay attention to the note 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, NC	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_B		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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



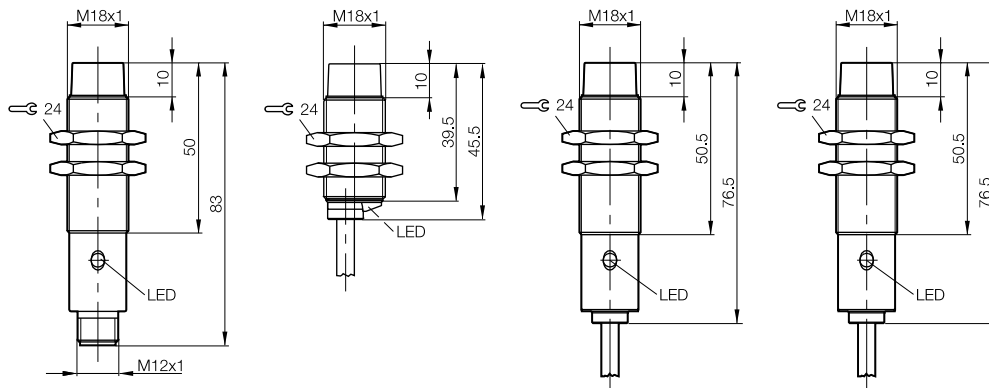
DC 3-/4-wire Inductive Standard Sensors Cylinder design, M18x1



Inductive sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder designs
Block designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Analog distance measurement
Special properties
Special 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	



DC 3-/4-wire Inductive Standard Sensors Cylinder design, M18x1

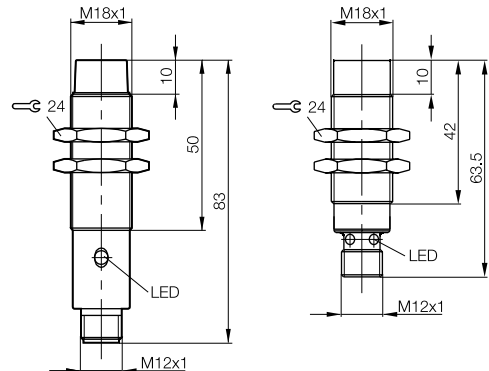


TRIPLEPROX

Series		M18x1	M18x1	
Installation type (pay attention to the note 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	BES016W	BES02Y7	
	Part number	BES 516-123-G-S4-H	BES M18ME1-PSC20F-S04G	
PNP, NC	Ordering code	BES01HW		
	Part number	BES 516-360-G-S4-H		
PNP, complementary	Ordering code			
	Part number			
NPN, NO	Ordering code		BES02Y6	
	Part number		BES M18ME1-NSC20F-S04G	
NPN, complementary	Ordering code			
	Part number			
Supply voltage U_B		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	

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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

DC 3-/4-wire Inductive Standard Sensors

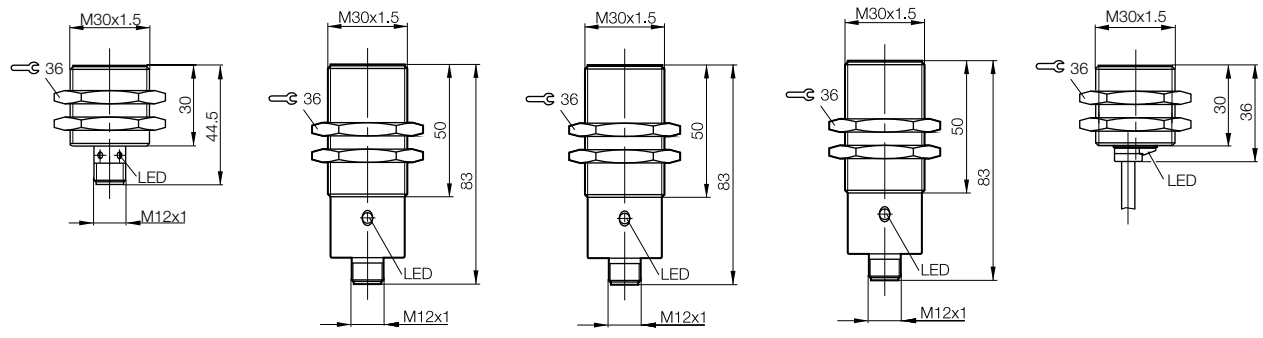
Cylinder design, M30x1.5



Inductive sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder designs
Block designs
DC 2-wire
AC/DC 2-wire
AC 2-wire
Analog distance measurement
Special properties
Special accessories



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 mm²



DC 3-/4-wire Inductive Standard Sensors

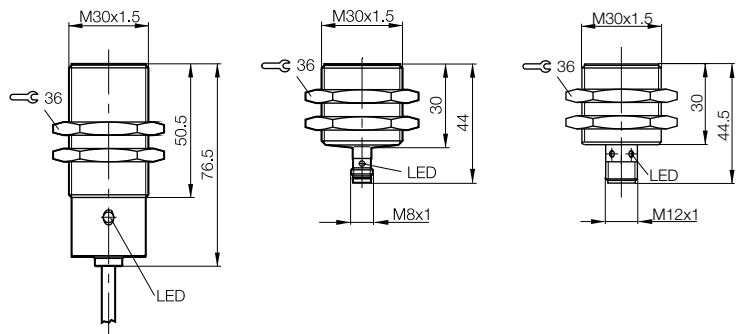
Cylinder design, M30x1.5



Series		M30x1.5	M30x1.5	M30x1.5
Installation type (pay attention to the note 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_B		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 (□)	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	-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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



DC 3-/4-wire Inductive Standard Sensors

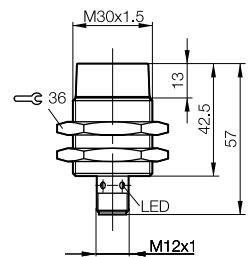
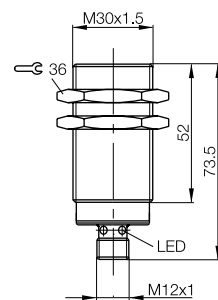
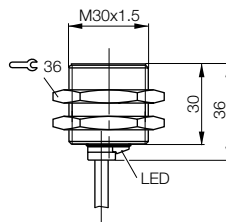
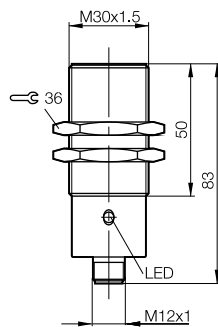
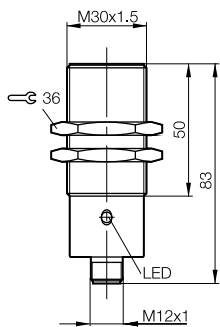
Cylinder design, M30x1.5



TRIPLEPROX



M30x1.5	M30x1.5	M30x1.5	M30x1.5	M30x1.5	M30x1.5	
Flush	Flush	Flush	Flush	Quasi-flush	Not flush	Inductive sensors
15 mm	15 mm	15 mm	15 mm	22 mm	15 mm	Global DC 3-wire
0...12 mm	0...12 mm	0...12 mm	0...12 mm	0...17.6 mm	0...12.2 mm	DC 3-/4-wire
■	■	■	■	■	■	Cylinder designs
BES01EA	BES01EC	BES00RR	BES02YM	BES00Y0		Block designs
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		DC 2-wire
		BES00LN	BES02YL	BES00LZ		AC/DC 2-wire
		BES 516-3028-G-E4-Y-02	BES M30MI1-POC22B-S04G	BES 516-3029-E5-Y-S4		AC 2-wire
	BES0166			BES00Y4		Analog distance measurement
	BES 516-114-G-S4-H			BES 516-363-E5-Y-S4		Special properties
		BES00WA	BES02YK			Special accessories
		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	10...30 V DC	
2.5 V	2.5 V	3.5 V	3.5 V	2 V	3.5 V	
250 V AC (□)	250 V AC (□)	75 V DC	75 V DC	75 V DC	75 V DC	
200 mA	200 mA	130 mA	200 mA	200 mA	130 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	
100 Hz	150 Hz	100 Hz	200 Hz	200 Hz	100 Hz	
Yellow LED	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	IP 67	
CE, cULus	CE	CE, cULus	CE	CE	CE, cULus	
			Large switching distance			
Brass-coated	Brass-coated	Brass-coated	Brass-coated	Brass-coated	Brass-coated	
PA 12	PA 12	PA 12	PBT	PA 12	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	M12 connector, 4-pin	



DC 3-/4-wire Inductive Standard Sensors

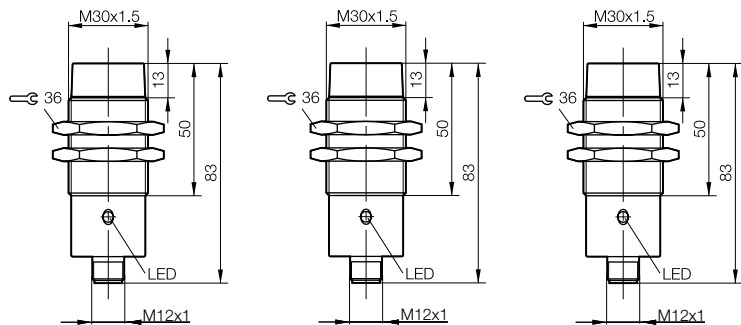
Cylinder design, M30x1.5



Series		M30x1.5	M30x1.5	M30x1.5
Installation type (pay attention to the note 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_B		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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



DC 3-/4-wire Inductive Standard Sensors

Cylinder design, M30x1.5

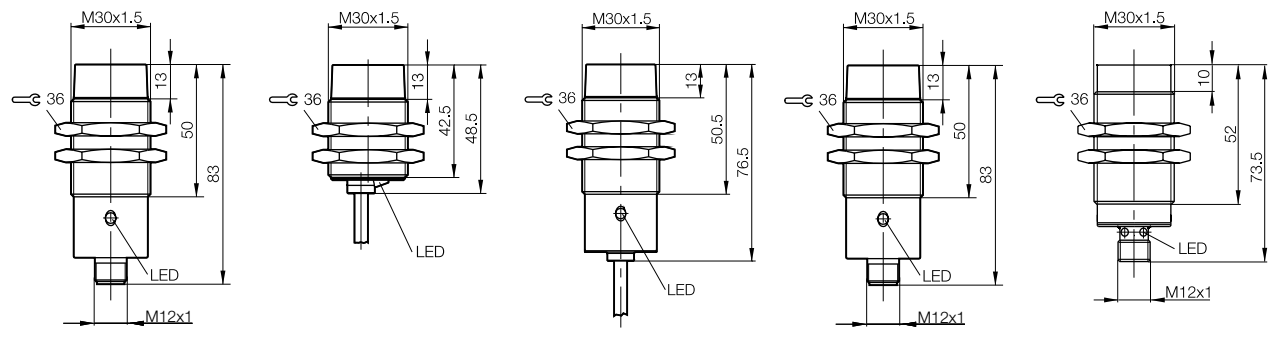


TRIPLEPROX



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 cable PVC, 3x0.34 mm	2 m cable PVC, 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
Analog distance measurement
Special properties
Special accessories

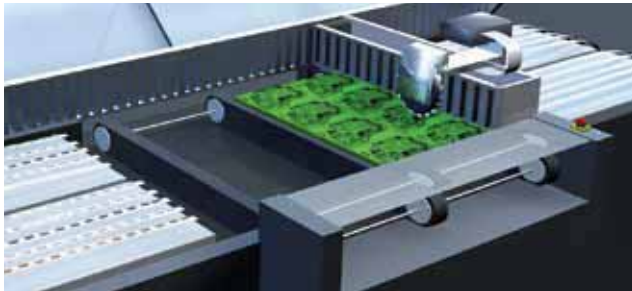


DC 3-/4-wire Inductive Standard Sensors

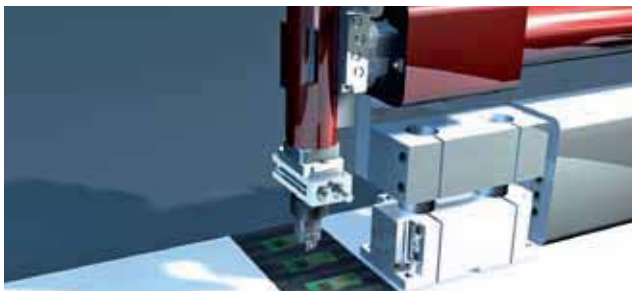
Block design, 5x5 mm

Five good reasons for using inductive 5x5 sensors

- One rugged, compact metal housing
- Two switching variants (can be installed flush): 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



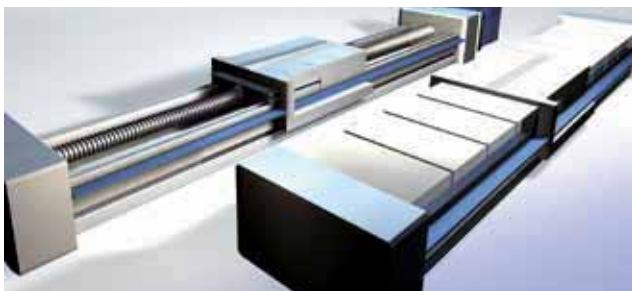
Electronics manufacturing: Mechatronic modules require miniature sensors. Balluff offers mini.s in the highest degree of precision.



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.

Series	
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
NPN, NO	Ordering code
	Part number
NPN, NC	Ordering code
	Part number
Supply voltage U_B	
Voltage drop U_d at I_e max.	
Rated insulation voltage U_i	
Rated operating current I_e	
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	

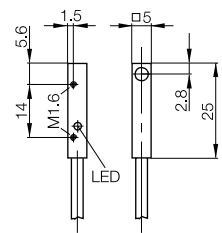
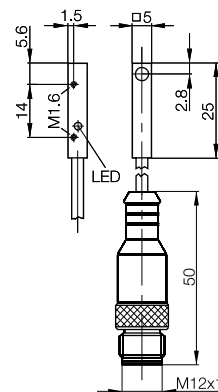
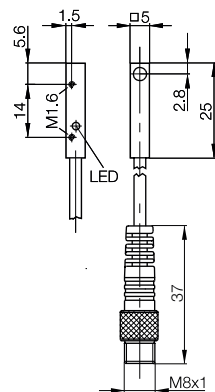
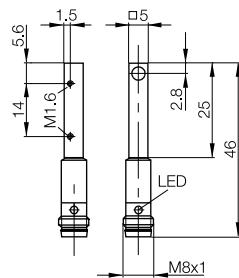
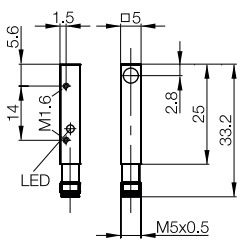
Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911.

Additional cable lengths on request.





5x5 mm	5x5 mm	5x5 mm	5x5 mm	5x5 mm	5x5 mm	Inductive sensors
Flush	Flush	Flush	Flush	Flush	Flush	Global DC 3-wire
0.8 mm	0.8 mm	0.8 mm	0.8 mm	0.8 mm	0.8 mm	DC 3-/4-wire
0...0.65 mm	0...0.65 mm	0...0.65 mm	0...0.65 mm	0...0.65 mm	0...0.65 mm	Cylinder designs
■	■	■	■	■	■	Block designs
BES01RM	BES01ZF	BES019W	BES019T	BES019P	BES019P	DC 2-wire
BES Q05AC-PSC08B-S26G	BES 516-3040-I02-C-S49	BES 516-3040-I02-C-S49-00,3	BES 516-3040-I02-C-S4-00,3	BES 516-3040-I02-C-PU-02	BES 516-3040-I02-C-PU-02	AC/DC 2-wire
BES01RH	BES01ZH			BES01A1	BES01A1	AC 2-wire
BES Q05AC-POC08B-S26G	BES 516-3042-I02-C-S49			BES 516-3042-I02-C-PU-02	BES 516-3042-I02-C-PU-02	Special properties
BES01RA	BES01A0			BES019Y	BES019Y	Analog distance measurement
BES Q05AC-NSC08B-S26G	BES 516-3041-I02-C-S49			BES 516-3041-I02-C-PU-02	BES 516-3041-I02-C-PU-02	Accessories
BES01R6	BES01A5			BES01A3	BES01A3	
BES Q05AC-NOC08B-S26G	BES 516-3043-I02-C-S49			BES 516-3043-I02-C-PU-02	BES 516-3043-I02-C-PU-02	
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	2.5 V	2.5 V	2.5 V	2.5 V	2.5 V	
75 V DC	75 DC	75 V DC	75 V DC	75 V DC	75 V DC	
100 mA	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	Yes/Yes/Yes	
-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	
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, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus	
Narrow design	Narrow design	Narrow design	Narrow design	Narrow design	Narrow design	
Anodized aluminum	Anodized aluminum	Anodized aluminum	Anodized aluminum	Anodized aluminum	Anodized aluminum	
PBT	PBT	PBT	PBT	PBT	PBT	
M5 connector, 3-pin	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	2 m PUR cable, 3x0.14 mm ²	



DC 3-/4-wire Inductive Standard Sensors

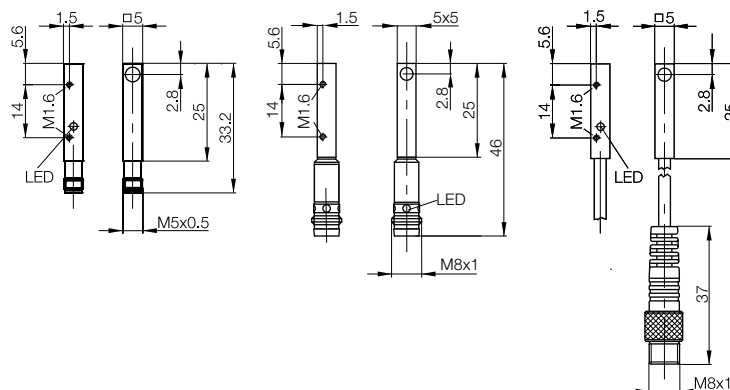
Block design, 5x5 mm



Series		5x5 mm	5x5 mm	5x5 mm
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
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, normally open	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_B		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	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.		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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

Additional cable lengths on request



DC 3-/4-wire Inductive Standard Sensors

Block design, 8x8 mm



SUPERSHORTIES



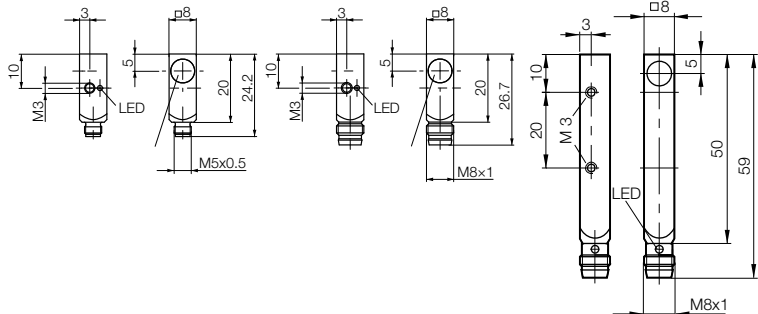
SUPERSHORTIES



Series		8x8 mm	8x8 mm	8x8 mm
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
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_B		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e 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_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.		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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



DC 3-/4-wire Inductive Standard Sensors

Block design, 8x8 mm

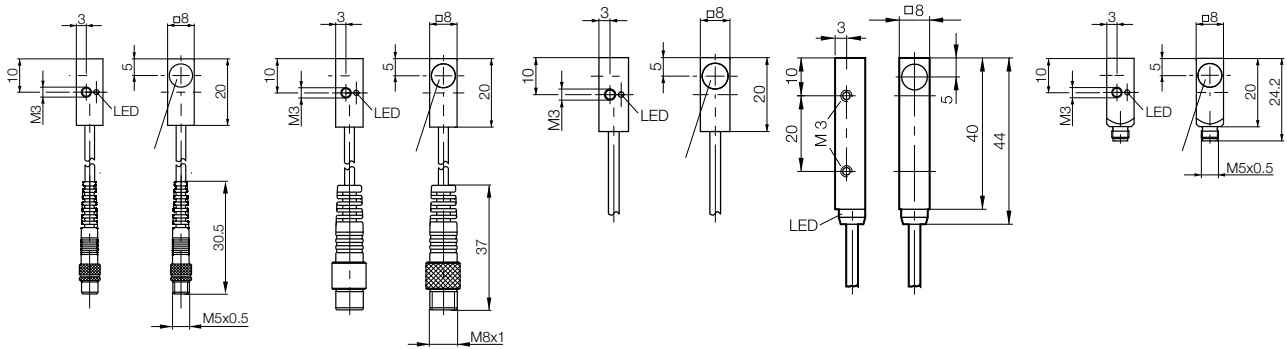


Inductive sensors
Global DC 3-wire
DC 3-/4-wire
Cylinder designs
Block designs
DC 2-wire
AC/DC 2-wire
AC 2-wire

Special properties
Analog distance measurement
Accessories



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



DC 3-/4-wire Inductive Standard Sensors

Block design, 8x8 mm

Inductive sensors BES 8x8 mm Supershorties – The sensors with the ideal dimensions

- Due to the miniature design, position sensing is now possible even where there used to be no space for a sensor.
- Modules can be shrunk even more, since the sensors require less space
- Optimal price/performance ratio
- Robust through high-quality metal enclosure
- High functional reserve through increased switching distance

Common application examples

- Linear units
- Robotics and automation
- Vibrating conveyors



Series		
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	
NPN, normally open	Ordering code	
	Part number	
NPN, NC	Ordering code	
	Part number	
Supply voltage U_B		
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		

Connection-Switching diagram, see page 906

The meaning of switching distance markings can be found on page 911

Additional cable lengths on request



DC 3-/4-wire Inductive Standard Sensors

Block design, 8x8 mm



SUPERSHORTIES

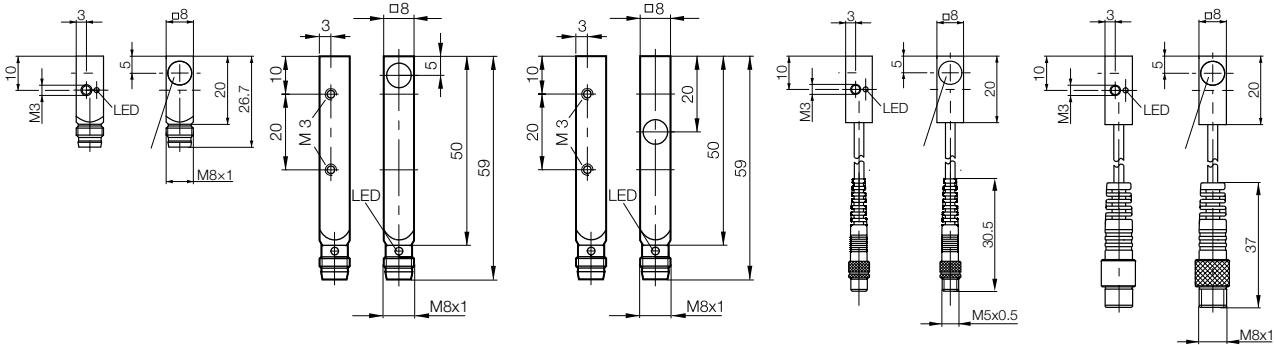
SUPERSHORTIES

SUPERSHORTIES



8x8 mm	8x8 mm	8x8 mm	8x8 mm	8x8 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
■ ■	■ ■	■ ■	■ ■	■ ■
BES03Y8	BES01U2	BES01UW	BES041U	BES041N
BES Q08MEC-PSC20B-S49G	BES Q08ZC-PSC20B-S49G	BES Q08ZE-PSC20B-S49G	BES Q08MEC-PSC20B-EP00,3-GS26	BES Q08MEC-PSC20B-EP00,3-GS49
BES03U3	BES01TF	BES01UK	BES041W	BES041P
BES Q08MEC-POC20B-S49G	BES Q08ZC-POC20B-S49G	BES Q08ZE-POC20B-S49G	BES Q08MEC-POC20B-EP00,3-GS26	BES Q08MEC-POC20B-EP00,3-GS49
BES03UC	BES01T3	BES01UC	BES041Y	BES041R
BES Q08MEC-NSC20B-S49G	BES Q08ZC-NSC20B-S49G	BES Q08ZE-NSC20B-S49G	BES Q08MEC-NSC20B-EP00,3-GS26	BES Q08MEC-NSC20B-EP00,3-GS49
BES03YJ	BES01RW	BES01U6	BES041Z	BES041T
BES Q08MEC-NOC20B-S49G	BES Q08ZC-NOC20B-S49G	BES Q08ZE-NOC20B-S49G	BES Q08MEC-NOC20B-EP00,3-GS26	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
2.8 V	2.5 V	2.5 V	2.8 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
Brass-coated	Cast zinc	Cast zinc	Brass-coated	Brass-coated
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 Standard Sensors

Block design, 8x8 mm

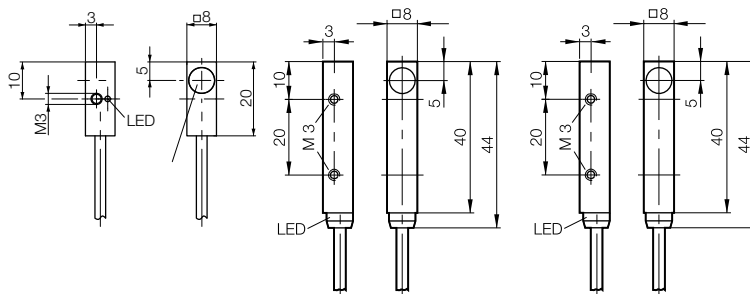


SUPERSHORTIES

Series		8x8 mm	8x8 mm	8x8 mm
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		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_B		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e 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_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.		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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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





8x8 mm	8x8 mm	8x8 mm	8x8 mm	8x8 mm
Flush	Flush	Flush	Flush	Quasi-flush
2 mm	2 mm	2.5 mm	2.5 mm	3 mm
0...1.6 mm	0...1.6 mm	0...2 mm	0...2 mm	0...2.4 mm
■	■	■	■	■■■
BES01UR	BES01UM	BES01U3	BES01UY	BES01U4
BES Q08ZE-PSC20B-BV02	BES Q08ZE-PSC20B-BP02	BES Q08ZC-PSC25B-S49G	BES Q08ZE-PSC25B-S49G	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	10...30 V DC	10...30 V DC
2.5 V	2.5 V	2.5 V	2.5 V	2 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	0...+70 °C	0...+70 °C	-25...+70°C
3 kHz	3 kHz	2 kHz	2 kHz	1 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
Cast zinc	Cast zinc	Cast zinc	Cast zinc	Long range Brass-coated
PBT	PBT	PBT	PBT	PBT
2 m PVC cable, 3x0.14 mm ²	2 m PUR cable, 3x0.14 mm ²	M8 connector, 3-pin	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

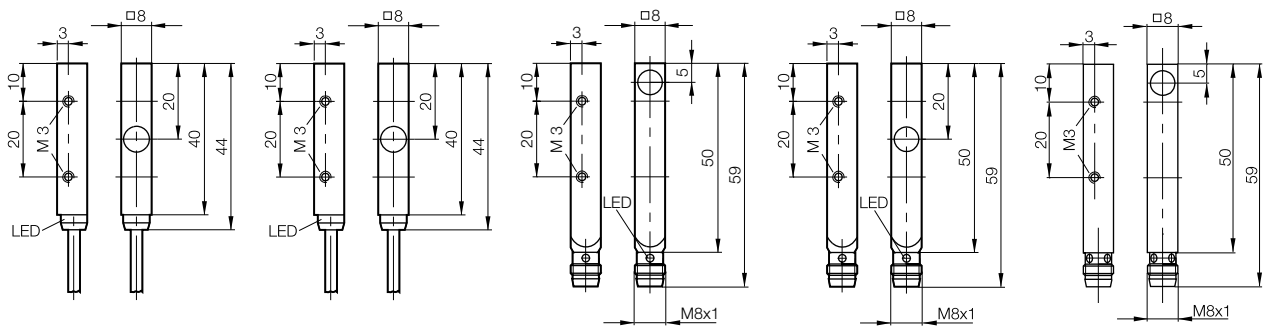
AC/DC 2-wire

AC 2-wire

Special properties

Analog distance measurement

Accessories



DC 3-/4-wire Inductive Standard Sensors

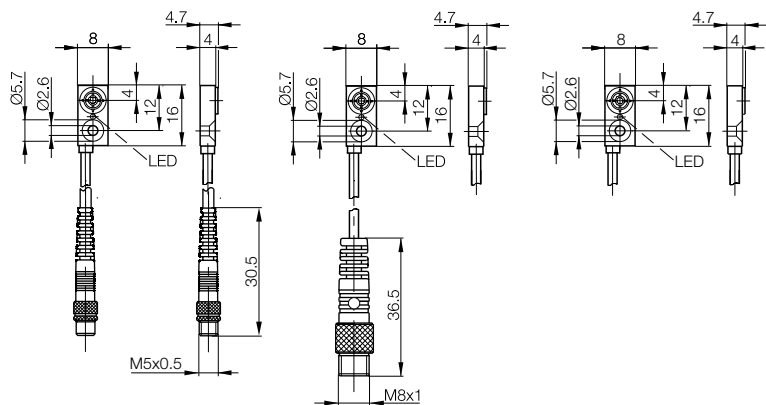
Block designs, 8×16×4 mm R04



Series		8×16×4 mm R04	8×16×4 mm	8×16×4 mm R04
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
Switching distance marking		■	■	■
PNP, NO	Ordering code	BES01YC	BES01YE	BES01YJ
	Part number	BES R04KC-PSC15B-EP00,2-GS26	BES R04KC-PSC15B-EP00,3-GS49	BES R04KC-PSC15B-EV02
PNP, NC	Ordering code	BES01Y7	BES01Y8	BES03J1
	Part number	BES R04KC-POC15B-EP00,2-GS26	BES R04KC-POC15B-EP00,3-GS49	BES R04KC-POC15B-EV02
NPN, normally open	Ordering code			BES01Y3
	Part number			BES R04KC-NSC15B-EV02
NPN, NC	Ordering code	BES01WY		BES01WZ
	Part number	BES R04KC-NOC15B-EP00,2-GS26		BES R04KC-NOC15B-EV02
Supply voltage U_B		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	1.8 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.		600 Hz	600 Hz	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	PA 6	PA 6	PA 6
	Sensing surface	PA 6/GF 30	PA 6/GF 30	PA 6/GF 30
Connection		0.2 m PUR cable with M5 connector, 3-pin	0.3 m PUR cable with M8 connector, 3-pin	2 m PVC cable, 3×0.09 mm ²

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



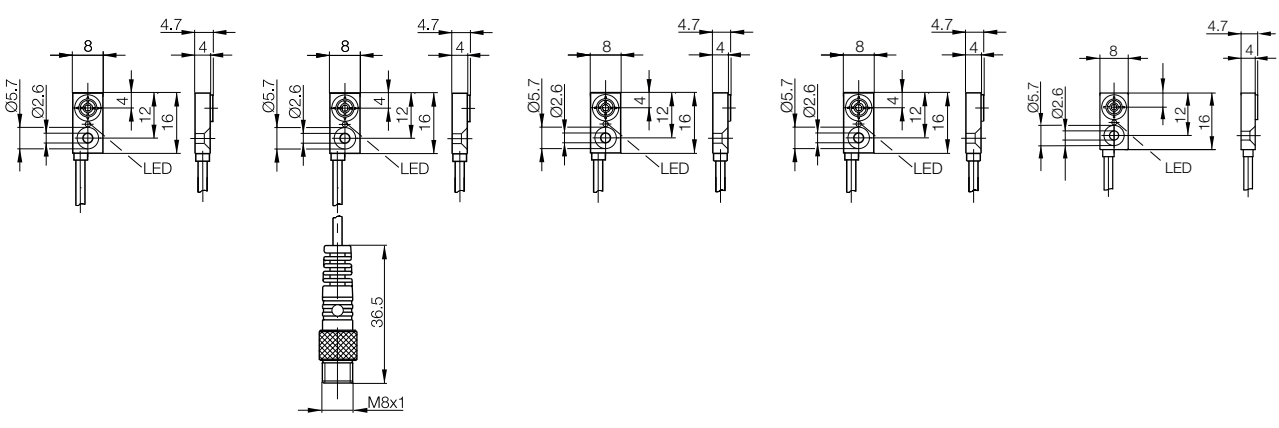
DC 3-/4-wire Inductive Standard Sensors

Block designs, 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	8×16×4 mm R04
Flush	Not flush	Not flush	Not flush	Not flush
1.5 mm	2.5 mm	2.5 mm	2.5 mm	2.5 mm
0...1.2 mm	0...2.2 mm	0...2 mm	0...2.2 mm	0...2 mm
■	■ ■	■ ■	■ ■	■ ■
BES01YF	BES01YM	BES01YT	BES01YN	
BES R04KC-PSC15B-EP02	BES R04KC-PSC25F-EP00,3-GS49	BES R04KC-PSC25F-EV02	BES R04KC-PSC25F-EP02	
	BES0447			
	BES R04KC-POC25F-EP00,3-GS49			
				BES03R8
				BES R04KC-NSC25F-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	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	3 kHz	150 Hz	3 kHz	150 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
PA 6	PA 6	PA 6	PA 6	PA 6
PA 6/GF 30	PA 6/GF 30	PA 6/GF 30	PA 6/GF 30	PA 6/GF 30
2 m PUR cable, 3×0.1 mm ²	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	2 m PUR cable, 3×0.1 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 Standard Sensors

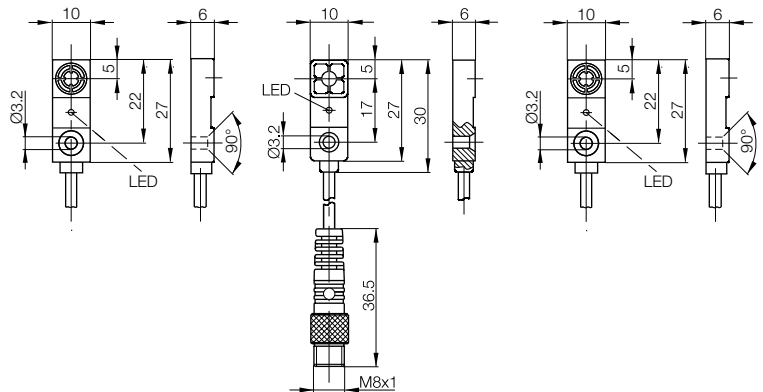
Block designs, 10×30×6 mm R03



Series		10×30×6 mm R03	10×30×6 mm R03	10×30×6 mm R03
Installation type (pay attention to the note 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, normally open	Ordering code		BES045C	
	Part number		BES R03KC-NSC30B-BP00,3-GS49	
Supply voltage U_B		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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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

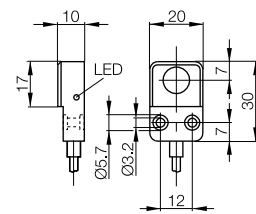
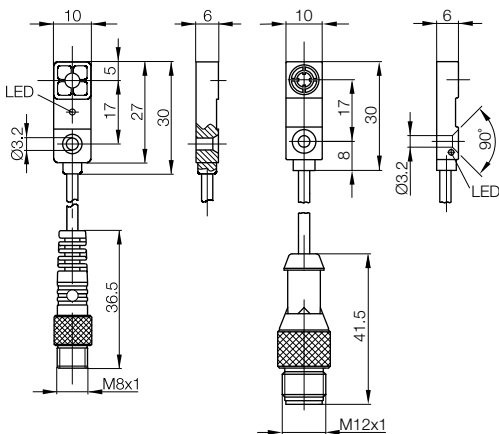


DC 3-/4-wire Inductive Standard Sensors

Block designs, 10×30×6 mm R03, 30×20×10 mm



10×30×6 mm R03	10×30×6 mm R03	30×20×10 mm	
Not flush	Not flush	Flush	
3 mm	3 mm	2 mm	
0...2.4 mm	0...2.4 mm	0...1.6 mm	
■	■	■	
BES02ZN	BES0397	BES033J	
BES R03KC-PSC30F-BV00.2-GS49	BES R03KC-PSC30F-BV00.3-GS04	BES 516-300-S279	
		BES033H	
		BES 516-300-S255	
10...30 V DC	10...30 V DC	10...30 V DC	Inductive sensors
1.5 V	1.5 V	0.5 V	Global DC 3-wire
75 V DC	75 V DC	75 V DC	DC 3-/4-wire
100 mA	100 mA	50 mA	Cylinder designs
No/No/Yes	No/No/Yes	Yes/No/No	Block designs
-25...+70°C	-25...+70°C	-25...+70°C	DC 2-wire
500 Hz	500 Hz	1.5 kHz	AC/DC 2-wire
Yellow LED	Yellow LED	Yes/No	AC 2-wire
IP 67	IP 67	IP 65	Special properties
			Analog distance measurement
PA 6	PA 6	Anodized GD-Al	Accessories
PA 6	PA 6	PBT	
0.2 m PVC cable with M8 connector, 3-pin	0.3 m PVC cable with M12 connector, 3-pin	5 m PVC cable, 3×0.14 mm ²	



Recommended short-circuit protection equipment: Miniature fuse in accordance with IEC 60127-2 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 Standard Sensors

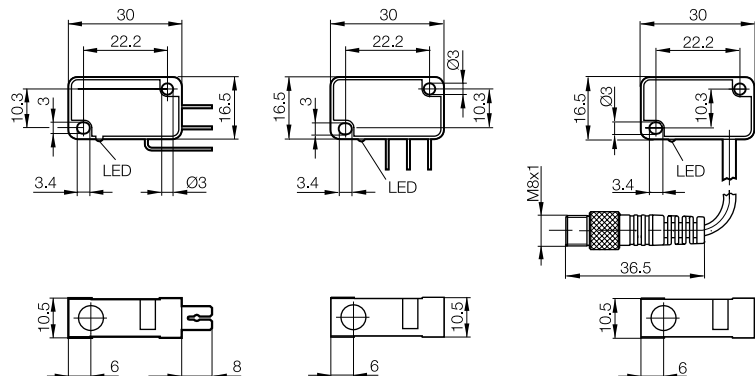
Block designs, 16×30×10 mm



		16×30×10 mm	16×30×10 mm	16×30×10 mm
Series		16×30×10 mm	16×30×10 mm	16×30×10 mm
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		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	BES01MT
	Part number	BES 517-351-N2-C	BES 517-351-N1-C	BES 517-351-NO-C-S49-00.2
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_B		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_o 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_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	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, x-pin

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



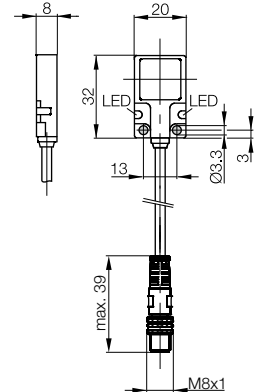
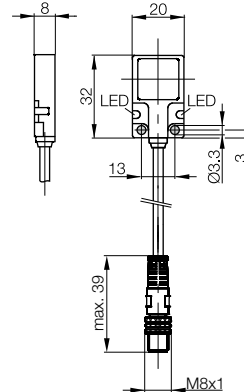
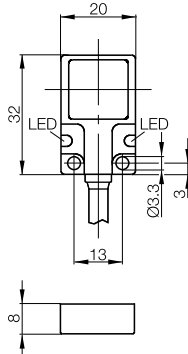
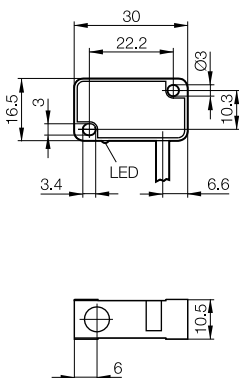
DC 3-/4-wire Inductive Standard Sensors

Block designs, 16×30×10 mm R01, 20×32×8 mm



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	5 mm	7 mm	7 mm
0...1.6 mm	0...4.1 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			
BES 517-351-NO-C-02			
BES01NF			BES01W1
BES 517-399-NO-C-02			BES R01ZC-NSC70B-BP00.2-GS49
BES01MY			
BES 517-352-NO-C-02			
	BES03Z2		
	BES R01ZC-NAC50B-BP02		
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	2 m PUR cable, 4×0.14 mm ²	0.3 m PUR cable with M8 connector, 3-pin	0.2 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 Standard Sensors

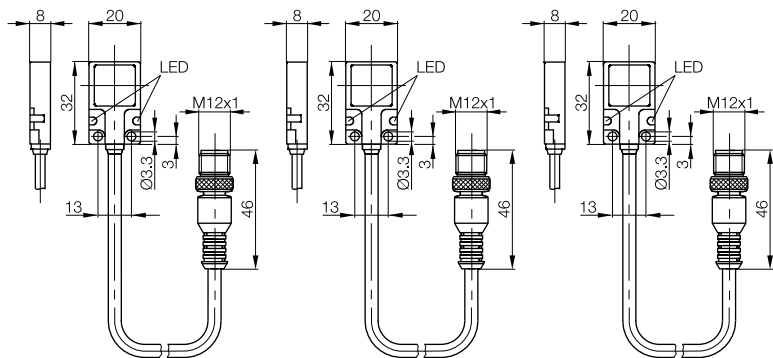
Block designs, 20×32×8 mm R01



Series		20×32×8 mm R01	20×32×8 mm R01	20×32×8 mm R01
Installation type (pay attention to the note in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		7 mm	7 mm	7 mm
Assured switching distance s_a		0...5.6 mm	0...5.6 mm	0...5.6 mm
Switching distance marking		■	■	■
PNP, NO	Ordering code	BES02PT		
	Part number	BES R01ZC-PSC70B-BP00.2-GS04-101		
PNP, complementary	Ordering code		BES01W2	BES0314
	Part number		BES R01ZC-PAC70B-BP00.2-GS04	BES R01ZC-PAC70B-BP00.2-GS04-107
NPN, complementary	Ordering code		BES01UZ	
	Part number		BES R01ZC-NAC70B-BP00.2-GS04	
Supply voltage U_B		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.		150 Hz	150 Hz	150 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 zinc	Cast zinc	Cast zinc
	Sensing surface	With ceramic coating	PA 12	With ceramic coating
Connection		0.2 m PUR cable with M12 connector, 4-pin	0.2 m PVC cable with M12 connector, 4-pin	0.2 m PUR cable with M12 connector, 4-pin

Connection-Switching diagram, see page 906
 The meaning of switching distance markings can be found on page 911

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



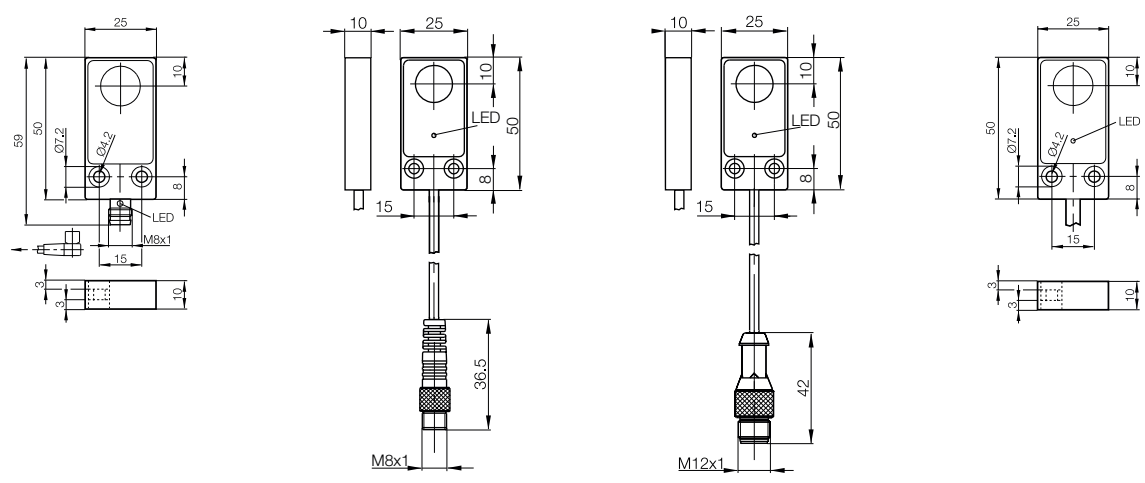
DC 3-/4-wire Inductive Standard Sensors

Block designs, 20×50×10 mm



20×50×10 mm	20×50×10 mm	20×50×10 mm	20×50×10 mm
Flush	Flush	Flush	Flush
5 mm	5 mm	5 mm	5 mm
0...4.1 mm	0...4.1 mm	0...4.1 mm	0...4.1 mm
■	■	■	■
BES01FR	BES01FT	BES01FN	BES01FH
BES 516-347-M0-C-S49	BES 516-347-M0-C-S49-00,2	BES 516-347-M0-C-S4-00,2	BES 516-347-M0-C-02
		BES0153	BES0179
		BES 516-133-M0-C-S4-00,2	BES 516-133-M0-C-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/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70°C	-25...+70°C	-25...+70°C	-25...+70°C
500 Hz	500 Hz	500 Hz	500 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
Cast aluminum	Cast aluminum	Cast aluminum	Cast aluminum
PBT	PBT	PBT	PBT
M8 connector, 3-pin	0.2 m PUR cable with M8 connector, 3-pin	0.2 m PUR cable with M12 connector, 4-pin	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 Standard Sensors

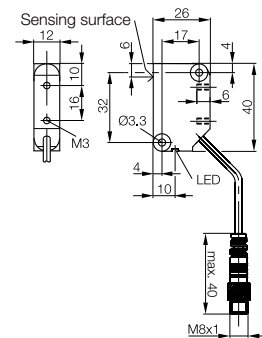
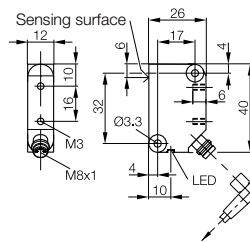
Block designs, 26×40×12 mm R05



Series	26×40×12 mm R05	26×40×12 mm R05	
Installation type (pay attention to the note 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 Part number	BES01Z7 BES R05KB-PSC20B-S49A	BES01Z3 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_B	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)	75 V DC	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.	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 Sensing surface	PA 12 PA 12	PA 12 PA 12
Connection	M8 connector, 3-pin	0.3 m PUR cable with M8 connector, 3-pin	

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



DC 3-/4-wire Inductive Standard Sensors

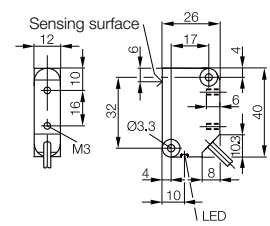
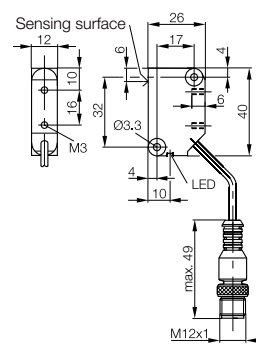
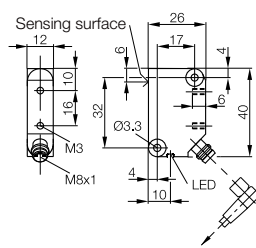
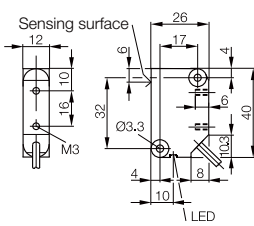
Block designs, 26×40×12 mm R05



- 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 Standard Sensors

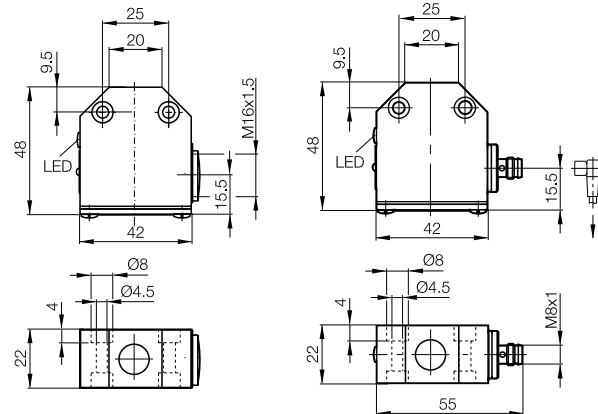
Block designs, 42x48x22 mm



Series		42x48x22 mm	42x48x22 mm
Installation type (pay attention to the note 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_B		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

Connection-Switching diagram, see page 906
 The meaning of switching distance markings can be found on page 911

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



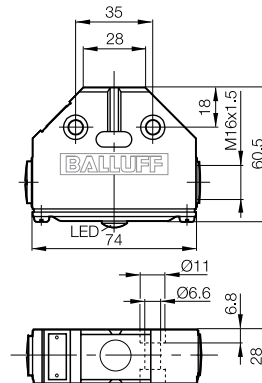
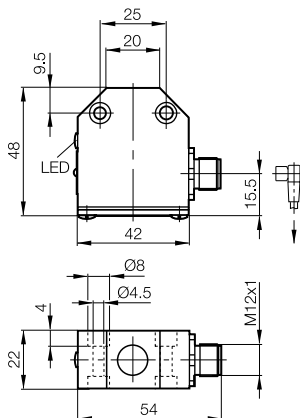
DC 3-/4-wire Inductive Standard Sensors

Block designs, 42×48×22 mm, 74×60.5×28 mm



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	

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 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.

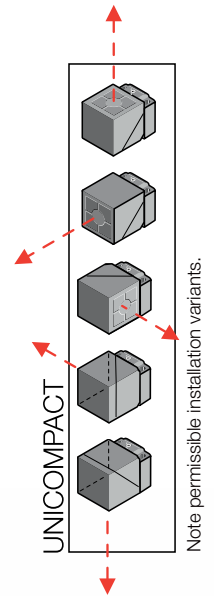
DC 3-/4-wire Inductive Standard Sensors

Block design, 40x40 mm Unicompat

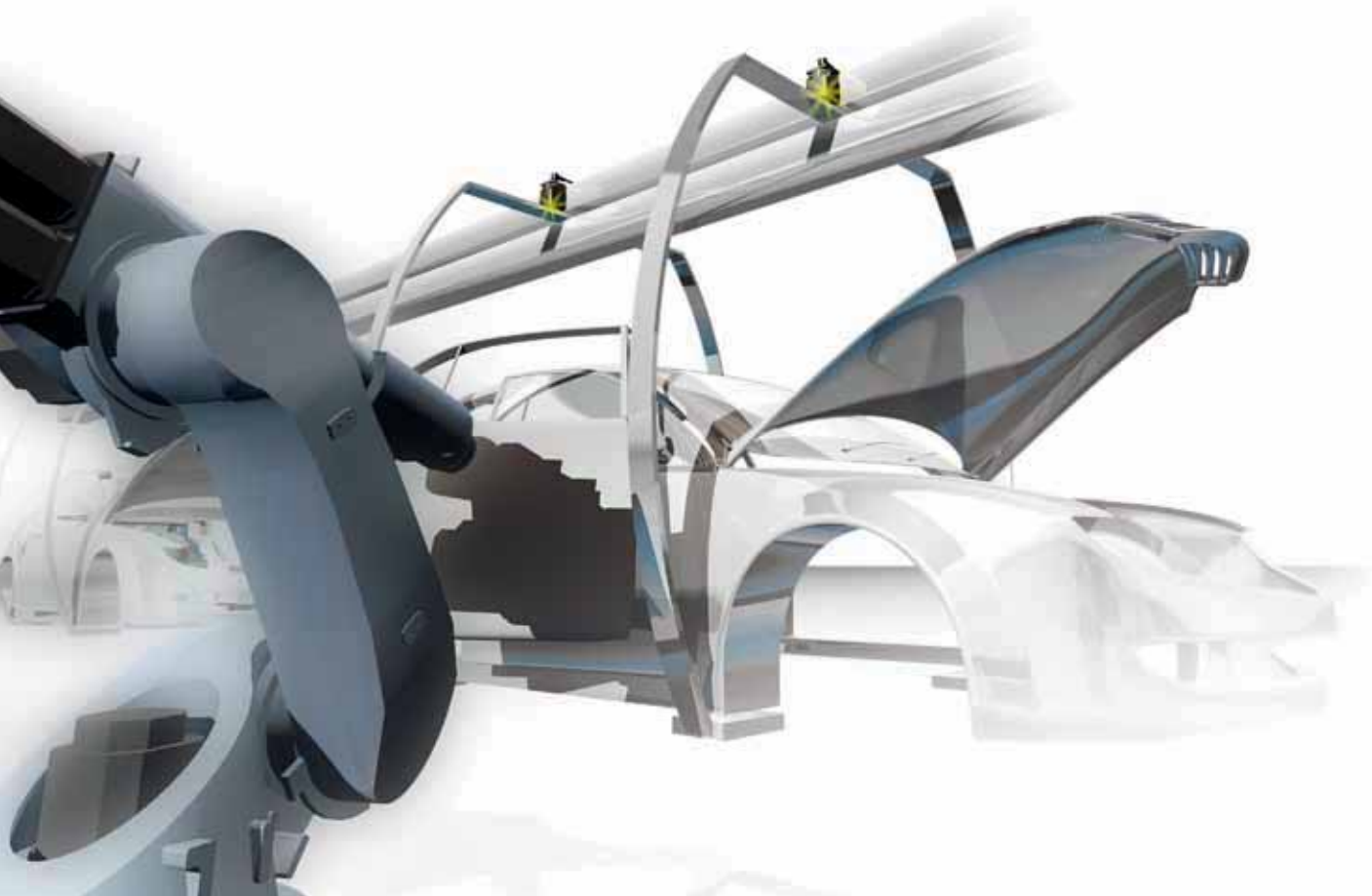
Unicompat

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.



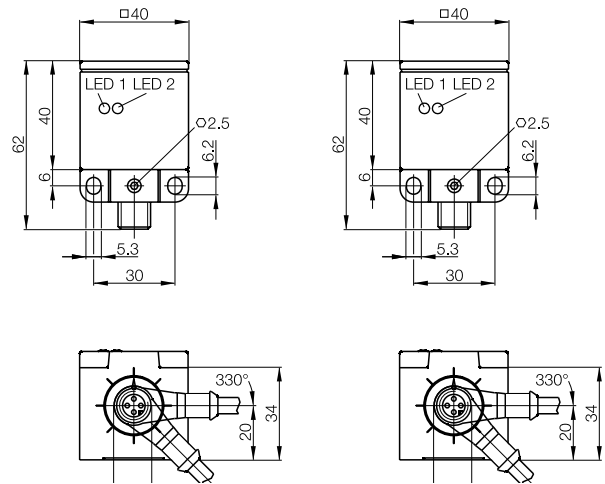
Compact sensor designs with large switching distances are required in material handling technology. In addition, the switching and operating state of the sensor must be able to be identified from far away.





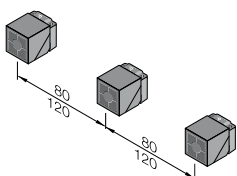
Series		40×40 mm Unicompat	40×40 mm Unicompat	
Installation type (pay attention to the note in the Basic Information chapter)		Flush	Flush	Inductive sensors
Rated switching distance s_n		20 mm	20 mm	Global DC 3-wire
Assured switching distance s_a		0...16 mm	0...16 mm	DC 3-/4-wire
Switching distance marking		■	■	Cylinder designs
PNP, NO	Ordering code	BES021W		Block designs
	Part number	BES Q40KFU-PSC20B-S04G		DC 2-wire
PNP, complementary	Ordering code	BES0217	BES0218	AC/DC 2-wire
	Part number	BES Q40KFU-PAC20B-S04G	BES Q40KFU-PAC20B-S04G-004	AC 2-wire
Supply voltage U_B		10...30 V DC	10...55 V DC	Special properties
Voltage drop U_d at I_e max.		2.5 V	2.5 V	Analog distance measurement
Rated insulation voltage U_i (protection class)		250 V AC (□)	250 V AC (□)	Accessories
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	

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

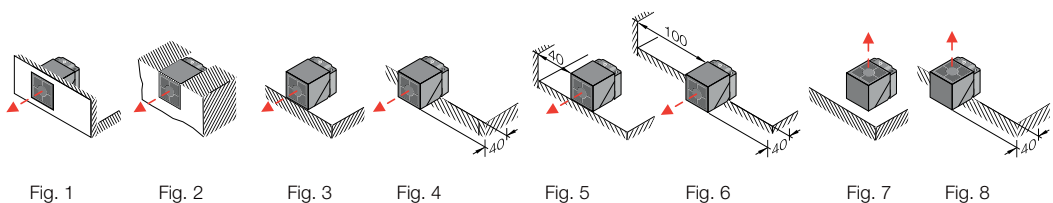


Row mounting

Flush 80 mm
Ø 120 mm non-flush



Permissible installation options



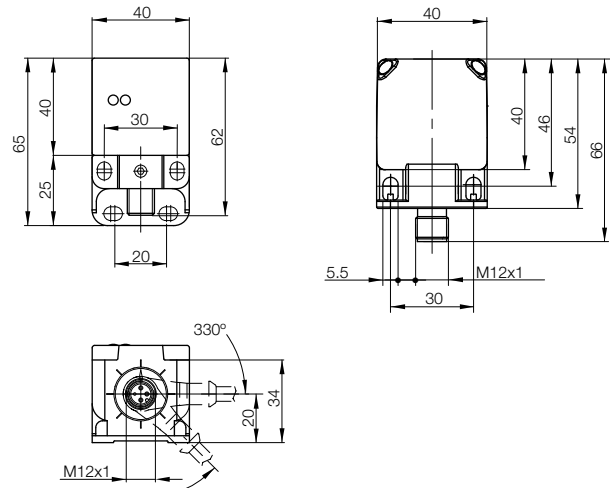
DC 3-/4-wire Inductive Standard Sensors

Block design, 40×40 mm Unicompat



Series	40×40 mm	40×40 mm	
Installation type (pay attention to the note 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...16.2 mm	
Switching distance marking	■	■	
PNP, NO	Ordering code	BES0306	
	Part number	BES Q40KFU-PSC20B-S04G-012	
PNP, complementary	Ordering code	BES03PN	
	Part number	BES Q40KHU-PAC20B-S04G	
NPN, complementary	Ordering code		
	Part number		
Supply voltage U_B	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.	50 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, cULus	
Material	Housing PBT/Cast zinc	PA	
	Sensing surface PBT	PA	
Possible installation variations	Image 1...8	Image 1...8	
Connection	M12 connector, 4-pin	M12 connector, 4-pin	

Connection-Switching diagram, see page 906
 The meaning of switching distance markings can be found on page 911



Housing optimized for material handling technology

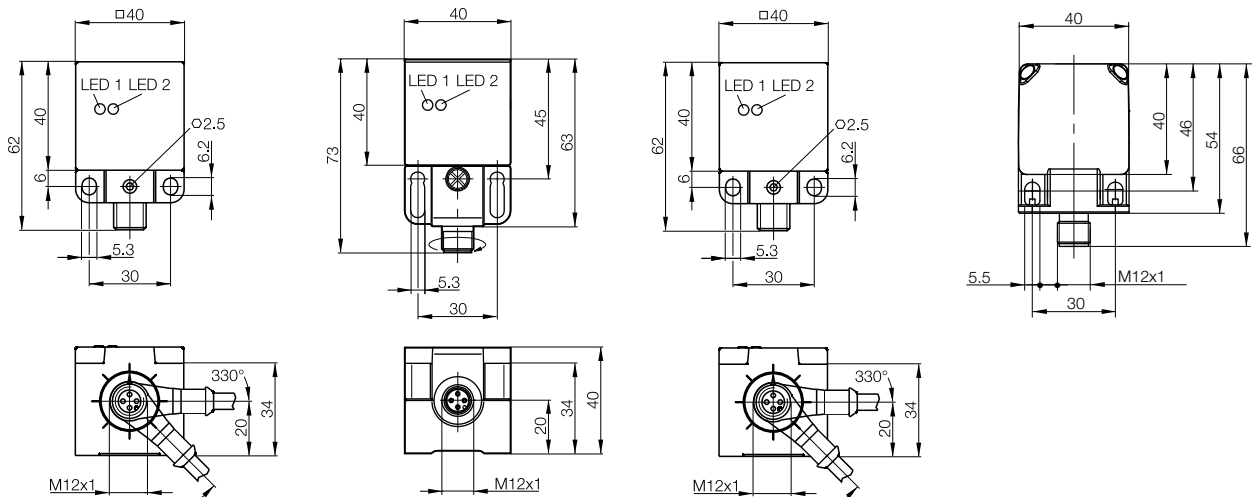
- Highly visible corner LEDs
- Sensor head can be mounted in five positions
- Connector outlet set to position within a 270° range





40×40 mm Not flush 25 mm 0...20 mm ■	40×40 mm Not flush 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 ■■
	BES0210 BES Q40KEU-PAH25F-S04G	BES021Z BES Q40KFU-PSC30F-S04G	BES0308 BES Q40KFU-PSC40F-S04G-012
BES022J BES Q40KFU-NAC25F-S04G		BES021E BES Q40KFU-PAC30F-S04G	
10...30 V DC	10...55 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 (□)	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	60 Hz
Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67
CE, cULus	CE	CE, cULus	CE, cULus
PBT	PBT/Cast zinc	PBT	PA
PBT	PBT	PBT	PA
Image 3...8	Image 3...8	Image 3...8	Image 3...8
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 Standard Sensors

Block design, 40x40 mm Unisensor

The Unisensor – multiple uses

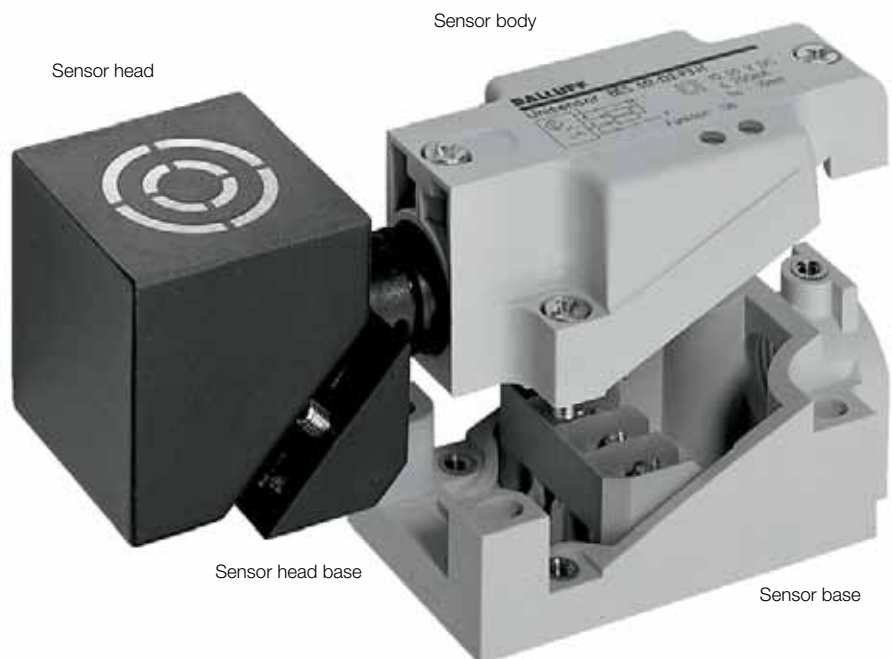
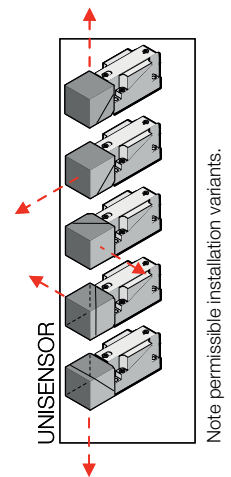
- The Unisensor is made up of three modular components: sensor head including sensor head base), sensor body and sensor base.
- Easily removable pin contacts join sensor head and sensor body, e.g. easy interchange of the modules without wiring.
- Sensor base with wiring terminals, self-lifting pressure 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.



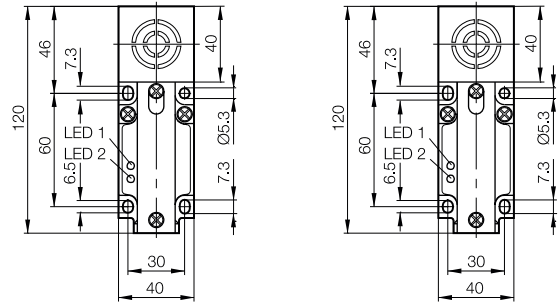
DC 3-/4-wire Inductive Standard Sensors

Block design, 40×40 mm Unisensor

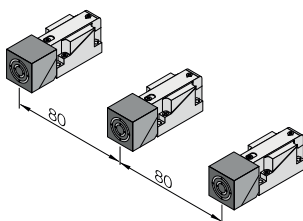


Series	40×40×120 mm Unisensor	40×40×120 mm Unisensor	
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush	Inductive sensors
Rated switching distance s_n	15 mm	15 mm	Global DC 3-wire
Assured switching distance s_a	0...12 mm	0...12 mm	DC 3-/4-wire
Switching distance marking	■	■	Cylinder designs
PNP, complementary	Ordering code BES0201	BES023F	Block designs
	Part number	BES 517-132-M3-H	DC 2-wire
Supply voltage U_B	10...55 V DC	10...55 V DC	AC/DC 2-wire
Voltage drop U_d at I_e max.	2.5 V	2.5 V	AC 2-wire
Rated insulation voltage U_i (protection class)	250 V AC (II)	250 V AC	Special properties
Rated operating current I_e	200 mA	200 mA	Analog distance measurement
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	Accessories
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 1...5	Image 1...5	
Connection	Screw terminal, metric cable gland	Screw terminal, cable gland NPT	

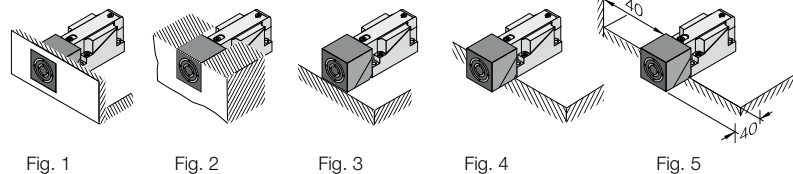
Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911



Row mounting



Installation variations



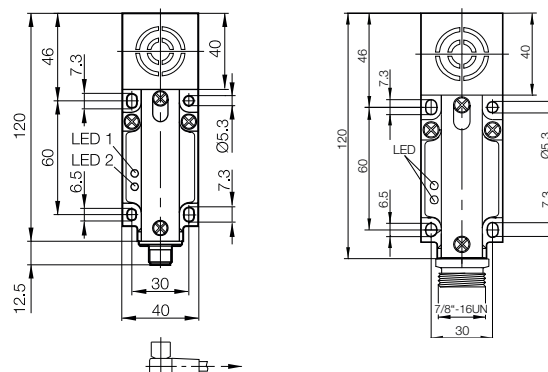
DC 3-/4-wire Inductive Standard Sensors

Block design, 40x40 mm Unisensor



Series		40x40x120 mm Unisensor	40x40x120 mm Unisensor
Installation type (pay attention to the note 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_B		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

Connection-Switching diagram, see page 906
 The meaning of switching distance markings can be found on page 911

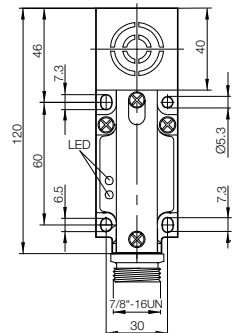
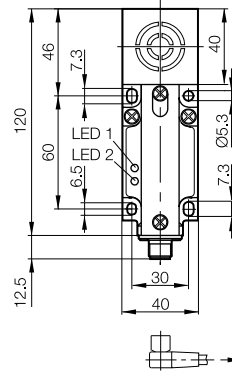
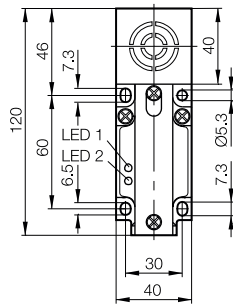
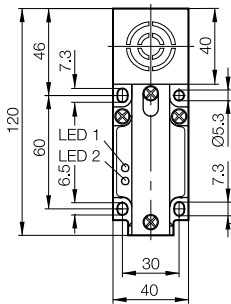


DC 3-/4-wire Inductive Standard Sensors

Block design, 40×40 mm Unisensor

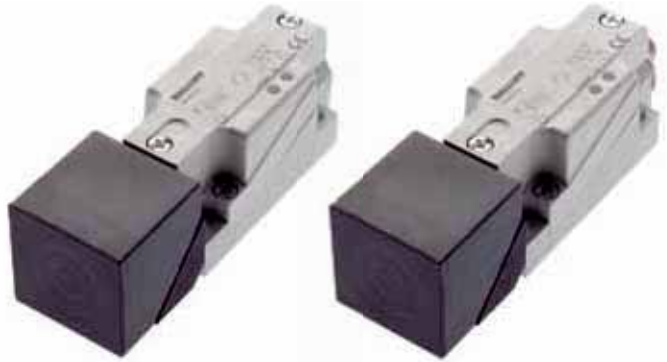


40×40×120 mm Unisensor	40×40×120 mm Unisensor	40×40×120 mm Unisensor	40×40×120 mm Unisensor	
Flush	Flush	Flush	Flush	Inductive sensors
20 mm	20 mm	20 mm	20 mm	Global DC 3-wire
0...16 mm	0...16 mm	0...16 mm	0...16 mm	DC 3-/4-wire
■	■	■	■	Cylinder designs
BES0209	BES023L	BES020A		Block designs
BES 517-132-M6-H	BES 517-132-U6-H	BES 517-132-M6-H-S4		DC 2-wire
BES020M		BES020N	BES020P	AC/DC 2-wire
BES 517-134-M6-H		BES 517-134-M6-H-S4	BES 517-134-M6-H-S5	AC 2-wire
10...55 V DC	10...55 V DC	10...55 V DC	10...55 V DC	Special properties
2.5 V	2.5 V	2.5 V	2.5 V	Analog distance measurement
250 V AC (□)	250 V AC (□)	250 V AC (□)	250 V AC (□)	Accessories
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	



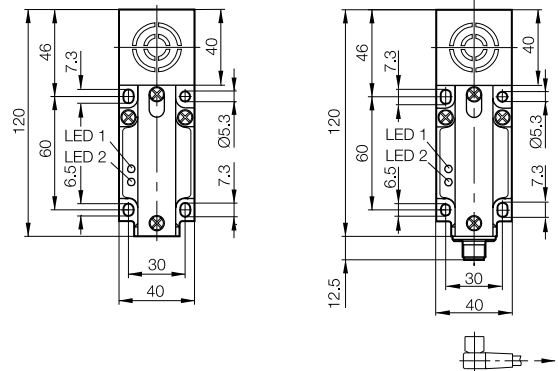
DC 3-/4-wire Inductive Standard Sensors

Block design, 40x40 mm Unisensor



Series	40x40x120 mm Unisensor		40x40x120 mm Unisensor
Installation type (pay attention to the note 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_{B_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

Connection-Switching diagram, see page 906
 The meaning of switching distance markings can be found on page 911

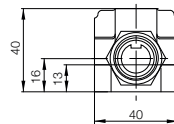
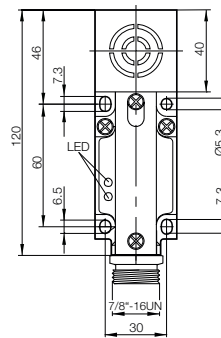
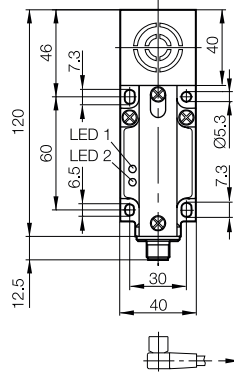
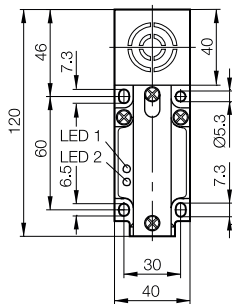


DC 3-/4-wire Inductive Standard Sensors

Block design, 40×40 mm Unisensor



40×40×120 mm Unisensor	40×40×120 mm Unisensor	40×40×120 mm Unisensor	
Not flush	Not flush	Not flush	Inductive sensors
25 mm	25 mm	25 mm	Global DC 3-wire
0...20 mm	0...20 mm	0...20 mm	DC 3-/4-wire
■	■	■	Cylinder designs
BES0235	BES0236		Block designs
BES 517-385-MV-C	BES 517-385-V-C-S4		DC 2-wire
		BES0312	AC/DC 2-wire
		BES 517-134-U4-H-S5	AC 2-wire
10...30 V DC	10...30 V DC	10...55 V DC	Special properties
3.5 V	3.5 V	2.5 V	Analog distance measurement
250 V AC (□)	250 V AC (□)	250 V AC (□)	Accessories
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	



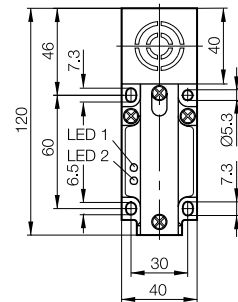
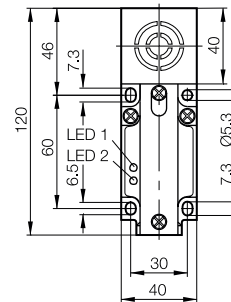
DC 3-/4-wire Inductive Standard Sensors

Block design, 40x40 mm Unisensor



Series		40x40x120 mm Unisensor	40x40x120 mm Unisensor
Installation type (pay attention to the note 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_B		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

Connection-Switching diagram, see page 906
 The meaning of switching distance markings can be found on page 911

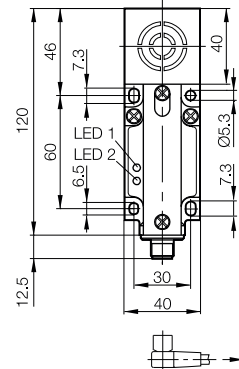
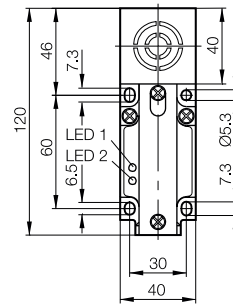
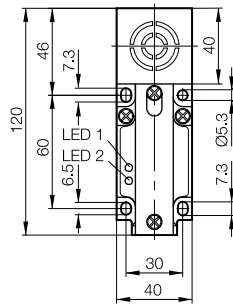
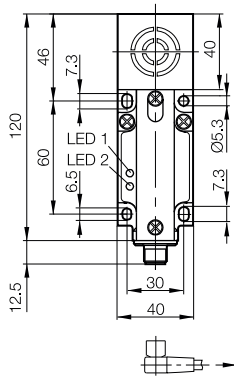


DC 3-/4-wire Inductive Standard Sensors

Block design, 40×40 mm Unisensor



40×40×120 mm Unisensor	40×40×120 mm Unisensor	40×40×120 mm Unisensor	40×40×120 mm Unisensor	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
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	



DC 3-/4-wire Inductive Standard Sensors

Block design, 80×80 mm Maxisensor

Flush mount

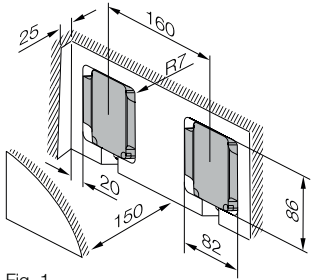


Fig. 1

Non-flush mount

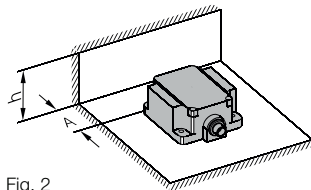


Fig. 2

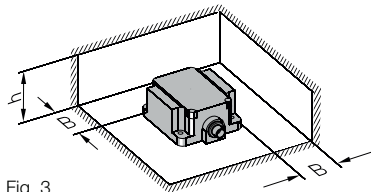


Fig. 3

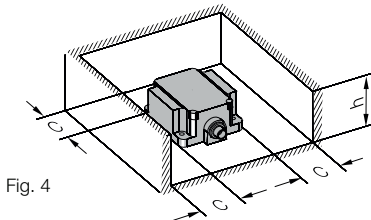


Fig. 4

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

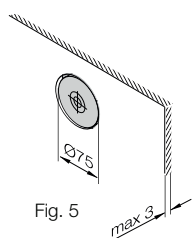


Fig. 5

Mounting in non-ferrous metals

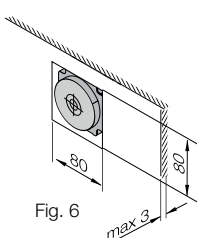


Fig. 6

Mounting in steel/non-ferrous metals

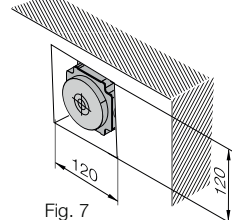


Fig. 7

Mounting on steel/non-ferrous metals

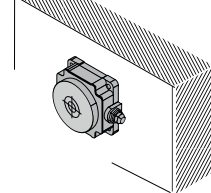
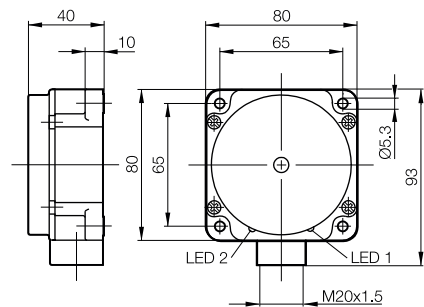


Fig. 8



Series	80×80×40 mm Maxisensor	
Installation type (pay attention to the note 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_B	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 (□)	
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	

Connection-Switching diagram, see page 906
Switching distance markings can be found on page 911

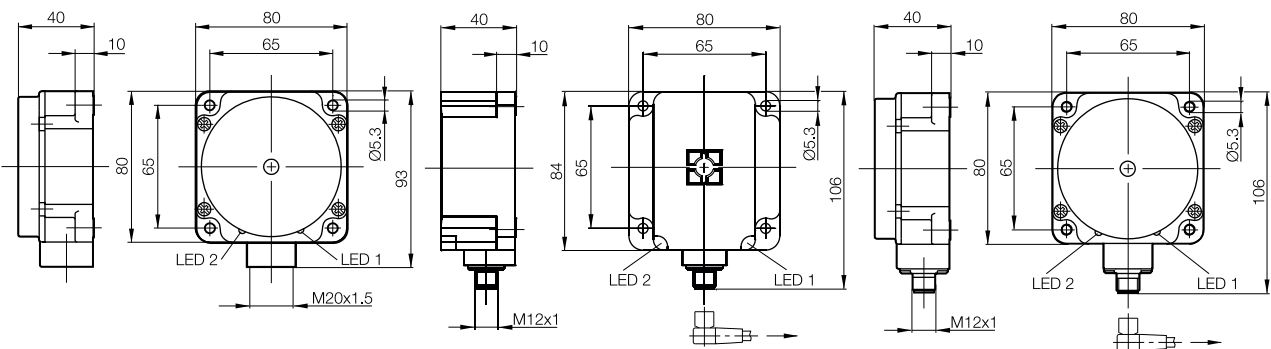


DC 3-/4-wire Inductive Standard Sensors

Block design, 80×80 mm Maxisensor



80×80×40 mm Maxisensor	80×84×40 mm Maxisensor	80×80×40 mm Maxisensor	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
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	



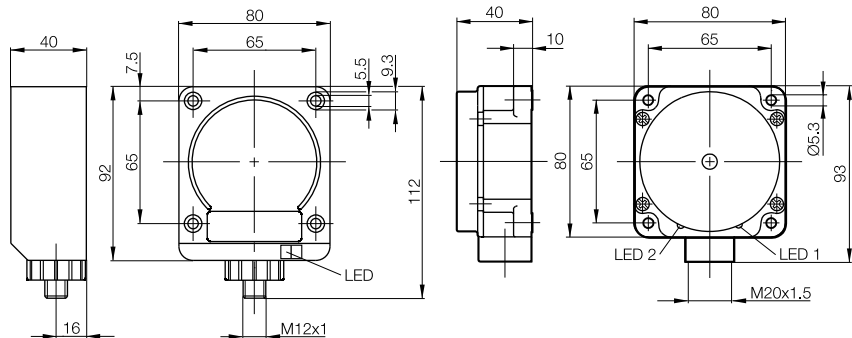
DC 3-/4-wire Inductive Standard Sensors

Block design, 80×80 mm Maxisensor



Series	80×92×40 mm Maxisensor	80×80×40 mm Maxisensor	
Installation type (pay attention to the note 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_B	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 Sensing surface: PPE	Housing: PBT Sensing surface: PBT	
Possible installation variations		Image 7, 8	
Connection	M12 connector, 4-pin	Screw terminal, metric cable gland	

Connection-Switching diagram, see page 906
Switching distance markings can be found on page 911

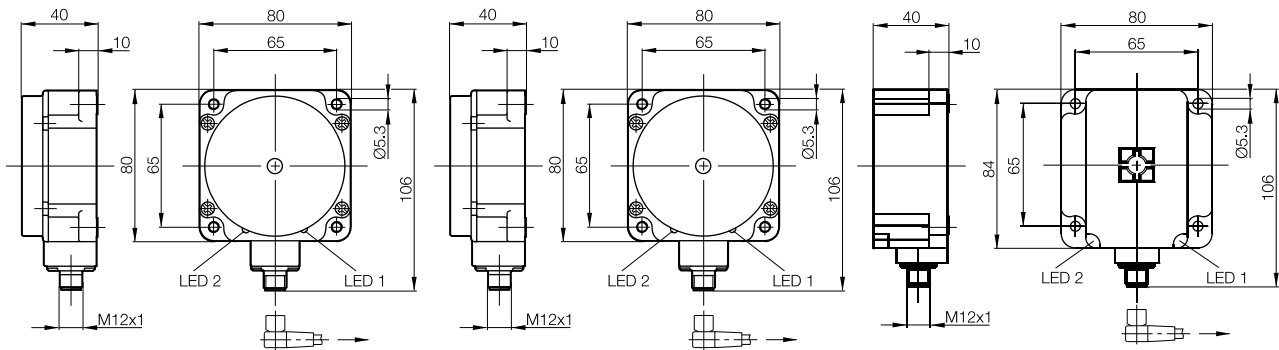


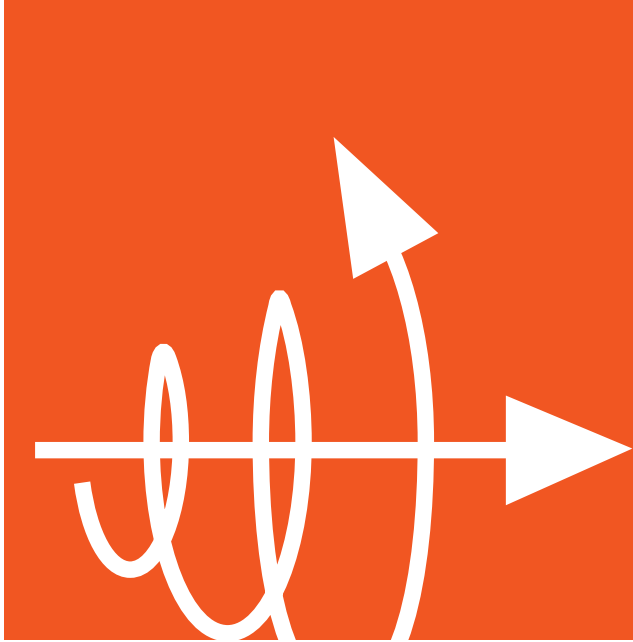
DC 3-/4-wire Inductive Standard Sensors

Block design, 80×80 mm Maxisensor



80×80×40 mm Maxisensor	80×80×40 mm Maxisensor	80×84×40 mm Maxisensor	
Not flush	Not flush	Not flush	Inductive sensors
50 mm	50 mm	50 mm	Global DC 3-wire
0...40 mm	0...40 mm	0...40 mm	DC 3-/4-wire
■	■	■	Cylinder designs
	BES023W	BES0228	Block designs
	BES 517-139-U5-H-S4	BES Q80KA-PSH50F-S04Q	DC 2-wire
		BES0226	AC/DC 2-wire
		BES Q80KA-PAH50F-S04Q	AC 2-wire
BES020W			Special properties
BES 517-140-M5-H-S4			Analog distance measurement
10...55 V DC	10...55 V DC	10...55 V DC	Accessories
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

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	535
M12×1	537
M18×1	540
M30×1.5	543

Block designs

20×32×8 mm (R01)	546
26×26×26 mm (Z03)	547
40×66×40 mm (Unicompact)	548
40×121×40 mm (Unisensor)	549
80×92×40 mm (maxi-sensor)	550



Basic information
and definitions
can be found
on **page 884**.



DC 2-wire Inductive Sensors

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



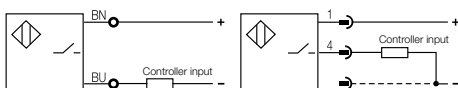
Series	
Installation type (observe instructions in Basic Information chapter)	
Rated switching distance s_n	
Assured switching distance s_a	
Switching distance marking	
Polarized, NO	Ordering code
	Part number
Polarized, NC	Ordering code
	Part number
Non-polarized, NO	Ordering code
	Part number
Non-polarized, NC	Ordering code
	Part number
Supply voltage U_B	
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	

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

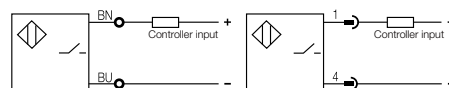
Additional cable lengths on request

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

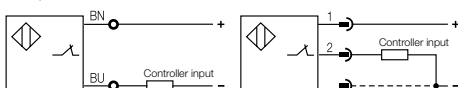
PNP, NO



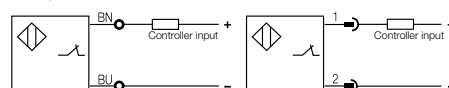
NPN, NO



PNP, NC



NPN, NC





Global



Global

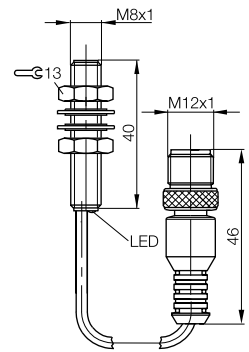
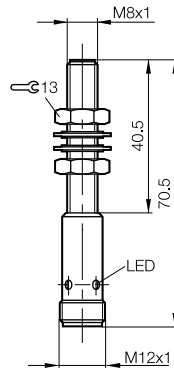
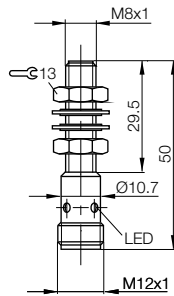
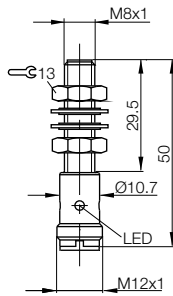
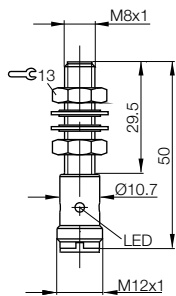


Global



M8x1	M8x1	M8x1	M8x1	M8x1
Flush	Flush	Flush	Flush	Flush
2 mm	2 mm	2 mm	1.5 mm	2 mm
0 to 1.6 mm	0 to 1.6 mm	0 to 1.4 mm	0 to 1.2 mm	0 to 1.6 mm
■ ■	■ ■	■ ■	■	■ ■
BES0022		BES000C0		BES001Z
BES M08ME1-GSC20B-S04G		BES M08ME1-GSC20B-S04G-101		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...30 V DC	10...55 V DC	10...36 V DC
5 V	5 V	5 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	130 mA	100 mA
5 mA	5 mA	5 mA	5 mA	5 mA
600 µA	600 µA	600 µA	500 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
1.5 kHz	1.5 kHz	1.5 kHz	3 kHz	1.5 kHz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67	IP 67
CE, cULus	CE	CE, cULus	CE, cULus	CE, cULus
Brass-coated	Brass-coated	Brass-coated	Stainless steel	Brass-coated
PBT	PBT	With ceramic coating	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
DC 2-wire
Cylinder designs
Block designs
AC/DC 2-wire
AC 2-wire
Special properties
Analog distance measurement
Accessories



DC 2-wire Inductive Sensors

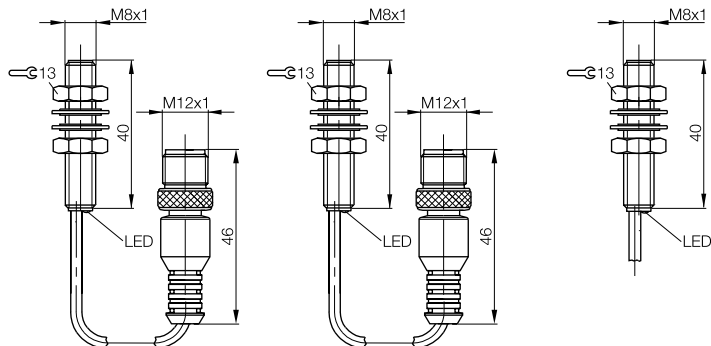
Cylinder designs, M8x1



Series		M8x1	M8x1	M8x1
Installation type (observe instructions in Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		2 mm	2 mm	2 mm
Assured switching distance s_a		0 to 1.6 mm	0 to 1.4 mm	0 to 1.6 mm
Switching distance marking		■ ■	■ ■	■ ■
Polarized, NO	Ordering code	BES03KR	BES0324	BES001L
	Part number	BES M08MG-GSH20B-BP00,3-GS04	BES M08MG-GSC20B-BP00,3-GS04-101	BES M08MG-GSC20B-BV02
Polarized, NC	Ordering code			BES024R
	Part number			BES M08MG-GOC20B-BV02
Non-polarized, NO	Ordering code			BES001T
	Part number			BES M08MG-USC20B-BV02
Non-polarized, NC	Ordering code			BES024T
	Part number			BES M08MG-UOC20B-BV02
Supply voltage U_B		10...55 V DC	10...30 V DC	10...36 V DC
Voltage drop U_d at I_e max.		5 V	5 V	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
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.		1.5 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 67	IP 67
Approvals		CE	CE, cULus	CE, cULus
Material	Housing	Brass-coated	Brass-coated	Brass-coated
	Sensing surface	PBT	With ceramic coating	PBT
Connection		0.3 m PUR cable with M12 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin	2 m PVC cable, 2x0.14 mm ²

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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

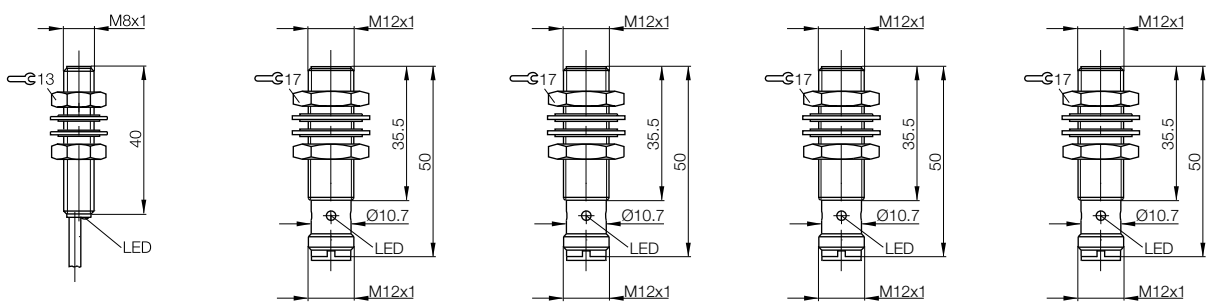




Inductive sensors
Global DC 3-wire
DC 3-/4-wire
DC 2-wire
Cylinder designs
Block designs
AC/DC 2-wire
AC 2-wire
Special properties
Analog distance measurement
Accessories



M8×1	M12×1	M12×1	M12×1	M12×1
Flush	Flush	Flush	Flush	Flush
2 mm	3 mm	3 mm	3 mm	3 mm
0 to 1.6 mm	0 to 2.4 mm	0 to 2.2 mm	0 to 2.4 mm	0 to 2.4 mm
■ ■	■ ■	■ ■	■ ■	■ ■
	BES003Z	BES00C1		
	BES M12MF-GSC30B-S04G	BES M12MF-GSC30B-S04G-101		
	BES024J			
	BES M12MF-GOC30B-S04G			
BES03KT			BES0041	BES03KU
BES M08MG-USH20B-BV02			BES M12MF-USC30B-S04G	BES M12MF-USH30B-S04G
			BES024K	
			BES M12MF-UOC30B-S04G	
10...55 V DC	10...36 V DC	10...30 V DC	10...36 V DC	10...55 V DC
5 V	4 V	5 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
1.5 kHz	1.3 kHz	1.5 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	CE, cULus	CE, cULus	CE, cULus	CE
Brass-coated	Brass-coated	Brass-coated	Brass-coated	Brass-coated
PBT	PA 12	With ceramic coating	PA 12	PA 12
2 m PVC cable, 2×0.14 mm ²	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin



DC 2-wire Inductive Sensors

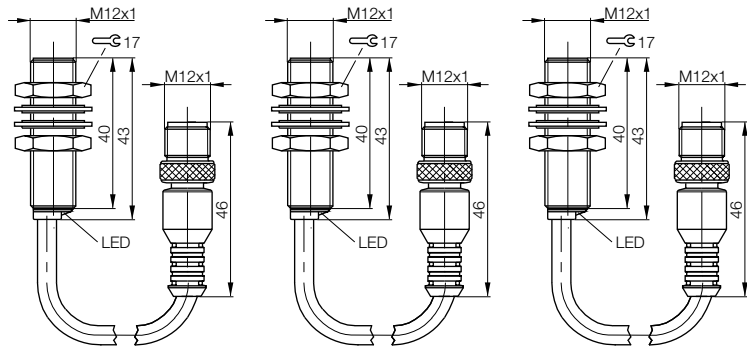
Cylinder design, M12x1



Series	M12x1	M12x1	M12x1
Installation type (observe instructions in 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 Part number	BES0042 BES M12MG-GSC30B-BP00,3-GS04	BES0326 BES M12MG-GSC30B-BP00,3-GS04-101
Polarized, NC	Ordering code Part number	BES03HK BES M12MG-GOC30B-BP00,3-GS04	BES03KW BES M12MG-GSH30B-BP00,3-GS04
Non-polarized, NO	Ordering code Part number		
Non-polarized, NC	Ordering code Part number		
Supply voltage U_B	10...36 V DC	10...30 V DC	10...55 V DC
Voltage drop U_d at I_o max.	4 V	4 V	4 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	1.3 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 Sensing surface: PA 12	Housing: Brass-coated Sensing surface: With ceramic coating	Housing: Brass-coated Sensing surface: PA 12
Connection	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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

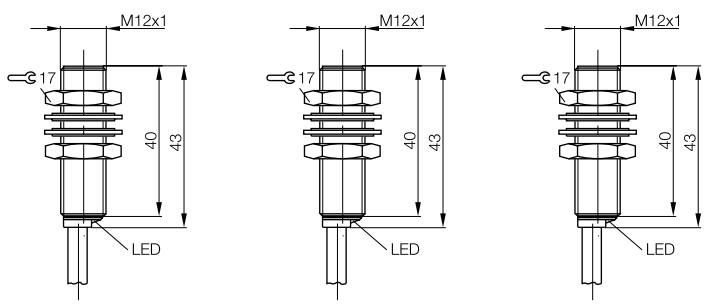
Additional cable lengths and PUR cable jacket material available on request.





M12x1	M12x1	M12x1		
Flush	Flush	Flush		
3 mm	3 mm	3 mm		
0...2.4 mm	0...2.4 mm	0...2.4 mm		
■ ■	■ ■	■ ■		
BES0045				
BES M12MG-GSC30B-BV02				
BES024L				
BES M12MG-GOC30B-BV02				
	BES004T	BES03KN		
	BES M12MG-USC30B-BV02	BES M12MG-USH30B-BV02		
	BES024M			
	BES M12MG-UOC30B-BV02			
10...36 V DC	10...36 V DC	10...55 V DC		
4 V	5 V	5 V		
75 V DC	75 V DC	75 V DC		
100 mA	100 mA	100 mA		
5 mA	5 mA	5 mA		
600 µA	600 µA	600 µA		
1 µF	1 µF	1 µF		
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes		
-25...+70 °C	-25...+70 °C	-25...+70 °C		
1.3 kHz	1.3 kHz	1.3 kHz		
Yellow LED	Yellow LED	Yellow LED		
IP 67	IP 67	IP 67		
CE, cULus	CE, cULus	CE		
Brass-coated	Brass-coated	Brass-coated		
PA 12	PA 12	PA 12		
2 m PVC cable, 2×0.34 mm ²	2 m PVC cable, 2×0.34 mm ²	2 m PVC cable, 2×0.34 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



DC 2-wire Inductive Sensors

Cylinder design, M18x1



Global

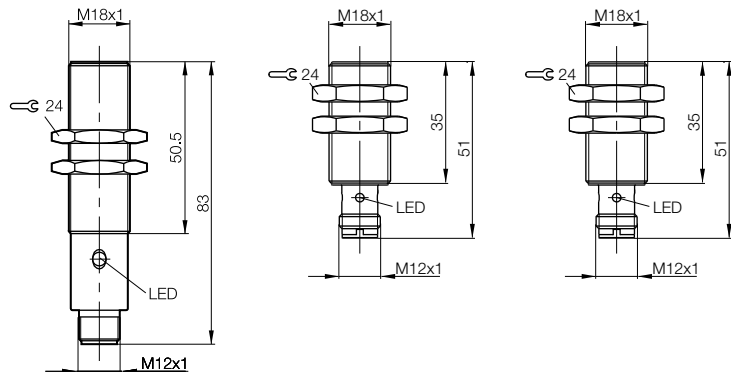


Global

Series	M18x1	M18x1	M18x1
Installation type (observe instructions in 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	BES03P2	BES02NR
Part number	BES 516-538-S4-H		BES M18MF-USC70B-S04G
Non-polarized, NC	Ordering code	BES031P	BES02NN
Part number	BES 516-539-S4-H		BES M18MF-UOC70B-S04G
Supply voltage U_B	10...55 V DC	10...36 V DC	10...36 V DC
Voltage drop U_d at I_o max.	5 V	4 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, cULus
Material	Housing: Brass-coated Sensing surface: PA 12	Brass-coated PA 12	Brass-coated PA 12
Connection	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



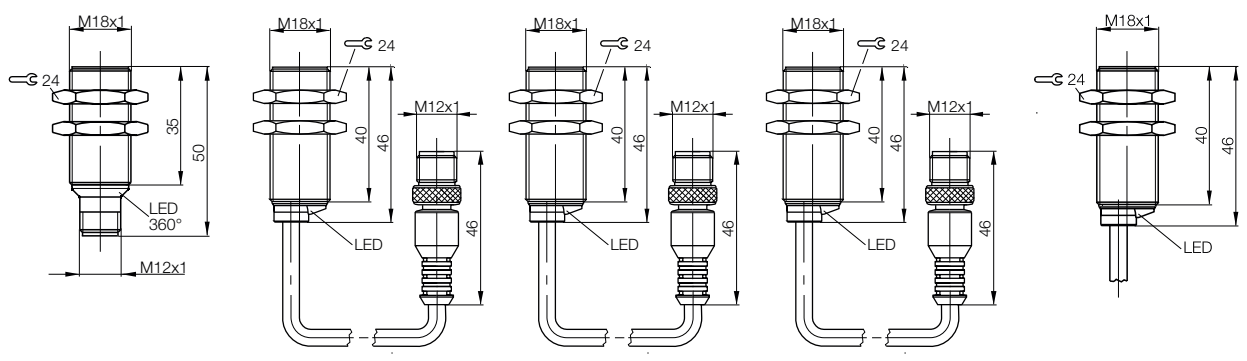
DC 2-wire Inductive Sensors Cylinder design, M18x1



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



M18x1	M18x1	M18x1	M18x1	M18x1
Flush	Flush	Flush	Flush	Flush
7 mm	7 mm	7 mm	7 mm	7 mm
0...5.6 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
BES039M				
BES M18MF-USH70B-S04K				
10...55 V DC	10...36 V DC	10...30 V DC	10...55 V DC	10...36 V DC
5 V	4 V	4 V	4 V	4 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
600 Hz	600 Hz	600 Hz	600 Hz	600 Hz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67	IP 67	IP 67
CE	CE, cULus	CE, cULus	CE	CE, cULus
Brass-coated	Brass-coated	Brass-coated	Brass-coated	Brass-coated
PA 12	PA 12	With ceramic coating	PA 12	PA 12
M12 connector, 4-pin	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



DC 2-wire Inductive Sensors

Cylinder design, M18x1

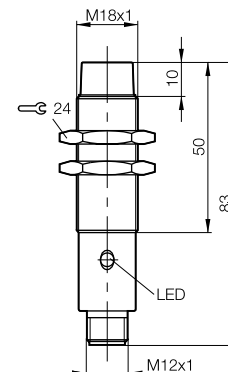
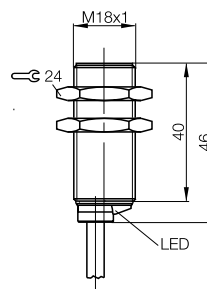
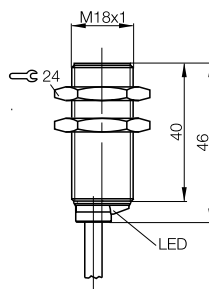


Global

Series	M18x1	M18x1	M18x1	
Installation type (observe instructions in Basic Information chapter)	Flush	Flush	Not flush	
Rated switching distance s_n	7 mm	7 mm	8 mm	
Assured switching distance s_a	0...5.6 mm	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	BES0073	BES039N	
	Part number	BES M18MG-USC70B-BV02	BES M18MG-USH70B-BV02	
Non-polarized, NC	Ordering code	BES02NU		BES0322
	Part number	BES M18MG-UOC70B-BV02		BES 516-547-S4-H
Supply voltage U_B	10...36 V DC	10...55 V DC	10...55 V DC	
Voltage drop U_d at I_e max.	5 V	5 V	5 V	
Rated insulation voltage U_i (protection class)	75 V DC	75 V DC	250 V AC (□)	
Rated operating current I_e	100 mA	100 mA	200 mA	
Minimum operating current I_m	5 mA	5 mA	5 mA	
Residual current I_r max.	600 μ A	600 μ A	500 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.	600 Hz	600 Hz	200 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	CE, cULus	
Material	Housing Sensing surface	Brass-coated PA 12	Brass-coated PA 12	Brass-coated PA 12
Connection		2 m PVC cable, 2x0.34 mm ²	2 m PVC cable, 2x0.34 mm ²	M12 connector, 4-pin

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



DC 2-wire Inductive Sensors

Cylinder design, M30x1.5



Global



Global

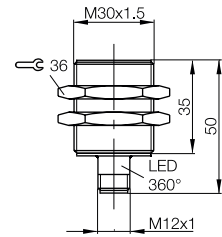
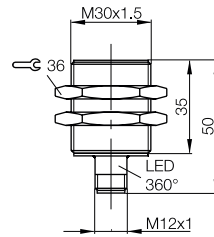
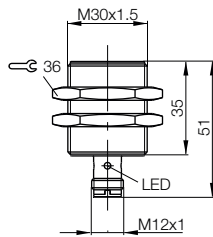
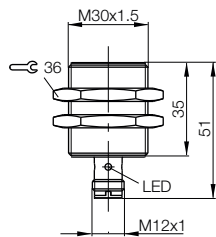
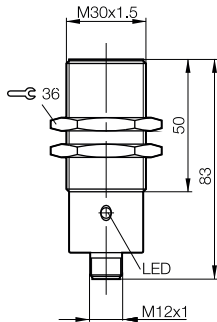


Global



M30x1.5	M30x1.5	M30x1.5	M30x1.5	M30x1.5
Flush	Flush	Flush	Flush	Flush
10 mm	15 mm	15 mm	15 mm	15 mm
0...8 mm	0...12 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		BES03FP
		BES M30MF-USC15B-S04G		BES M30MF-USH15B-S04K
BES031T		BES027F		
BES 516-541-S4-H		BES M30MF-UOC15B-S04G		
10...55 V DC	10...36 V DC	10...36 V DC	10...36 V DC	10...55 V DC
5 V	4 V	5 V	4 V	5 V
250 V AC (□)	75 V DC	75 V DC	75 V DC	75 V DC
200 mA	100 mA	100 mA	100 mA	100 mA
5 mA	5 mA	5 mA	5 mA	5 mA
500 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
150 Hz	400 Hz	400 Hz	400 Hz	400 Hz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
IP 68 per BWN Pr. 20	IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE
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	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



DC 2-wire Inductive Sensors

Cylinder design, M30x1.5

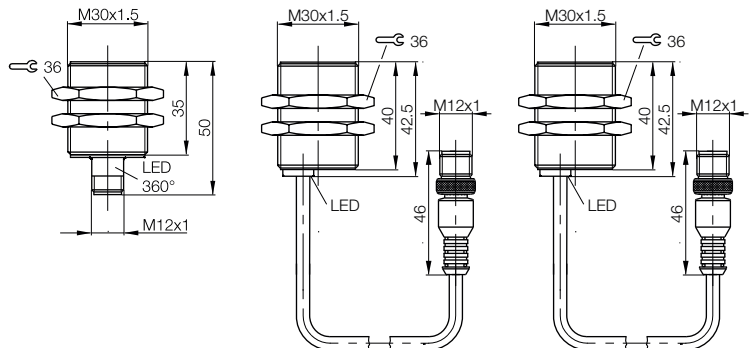


Global

Series	M30x1.5	M30x1.5	M30x1.5	
Installation type (observe instructions in 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 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	BES0094		
	Part number	BES M30MF-USC15B-S04K		
Non-polarized, NC	Ordering code	BES027H		
	Part number	BES M30MF-UOC15B-S04K		
Supply voltage U_B	10...36 V DC	10...55 V DC	10...36 V DC	
Voltage drop U_d at I_e max.	5 V	4 V	4 V	
Rated insulation voltage U_i (protection class)	75 V DC	75 V DC	75 V DC	
Rated operating current I_e	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.	400 Hz	400 Hz	400 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, cULus	
Material	Housing Sensing surface	Brass-coated PA 12	Brass-coated PA 12	With ceramic coating
Connection	M12 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin	

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



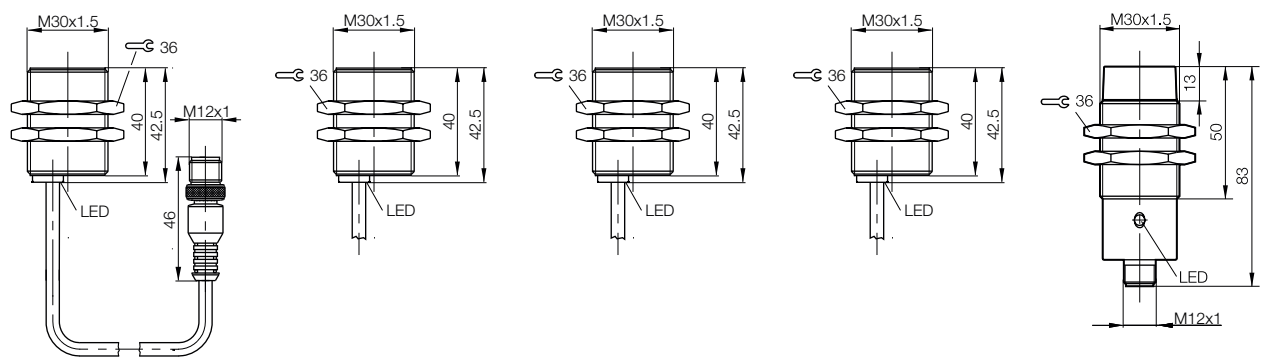
DC 2-wire Inductive Sensors

Cylinder design, M30x1.5



M30x1.5	M30x1.5	M30x1.5	M30x1.5	M30x1.5
Flush	Flush	Flush	Flush	Not flush
15 mm	15 mm	15 mm	15 mm	15 mm
0...12 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...36 V DC	10...55 V DC	10...55 V DC
4 V	4 V	5 V	5 V	5 V
75 V DC	75 V DC	75 V DC	75 V DC	250 V AC (□)
100 mA	100 mA	100 mA	100 mA	200 mA
5 mA	5 mA	5 mA	5 mA	5 mA
600 μA	600 μA	600 μA	600 μA	500 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
400 Hz	400 Hz	400 Hz	400 Hz	100 Hz
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	CE, cULus
Brass-coated	Brass-coated	Brass-coated	Brass-coated	Brass-coated
PA 12	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	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



DC 2-wire Inductive Sensors

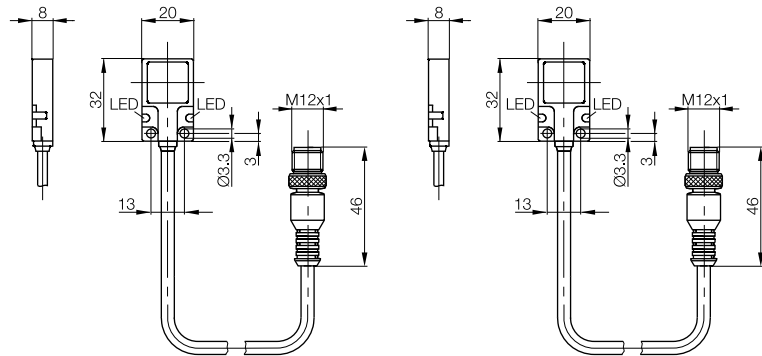
Block designs, 20×32×8 mm



Series		20×32×8 mm R01	20×32×8 mm R01
Installation type (observe instructions in Basic Information chapter)		Flush	Flush
Rated switching distance s_n		5 mm	5 mm
Assured switching distance s_a		0...4 mm	0...3.9 mm
Switching distance marking		■	■
Non-polarized, NO	Ordering code	BES032C	BES03TM
	Part number	BES R01ZC-USC50B-BP00.2-GS04	BES R01ZC-USC50B-BP00.2-GS04-101
Supply voltage U_B		10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.		5 V	5 V
Rated insulation voltage U_i		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.		300 Hz	300 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	Cast zinc	Cast zinc
	Sensing surface	PA 12	With ceramic coating
Connection		0.2 m PUR cable with M12 connector, 4-pin	0.2 m PUR cable with M12 connector, 4-pin

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

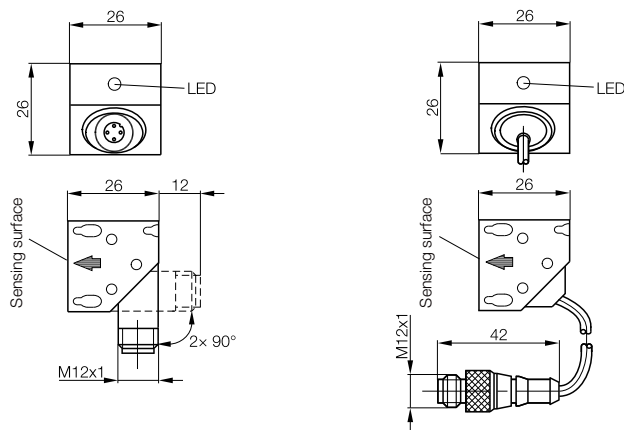
Additional cable lengths and PUR cable jacket material available on request.





Series	26×26×26 mm Z03		26×26×26 mm Z03	Inductive sensors
Installation type (observe instructions in 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	DC 3-/4-wire
Switching distance marking	■		■	
Polarized, NO	Ordering code	BES030H	BES030E	DC 2-wire
	Part number	BES Z03K-GSS10B-S04U-006	BES Z03K-GSS10B-EP00,15-GS04-006	
Supply voltage U_B	10...36 V DC		10...36 V DC	Cylinder designs
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 (□)	Block designs
Rated operating current I_e	100 mA		100 mA	
Minimum operating current I_m	2 mA		2 mA	AC/DC 2-wire
Residual current I_r max.	600 μ A		600 μ A	
Permissible load capacitance max.	0.1 μ F		0.1 μ F	AC 2-wire
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes		Yes/Yes/Yes	
Ambient temperature T_a	-25...+70 °C		-25...+70 °C	Special properties
Switching frequency f max.	250 Hz		250 Hz	
Output function indicator	Yellow LED		Yellow LED	Analog distance measurement
Degree of protection as per IEC 60529	IP 67		IP 67	
Approvals	CE		CE	Accessories
Material	Housing	PA	PA	
	Sensing surface	PA	PA	
Connection	M12 connector, 4-pin		0.15 m PUR cable with M12 connector, 4-pin	

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

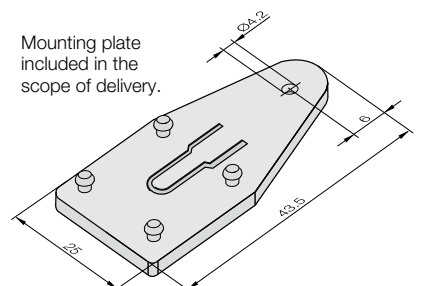
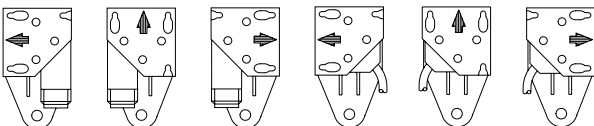


Small, compact block sensor with increased switching distance for quick installation

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
- Easy to install



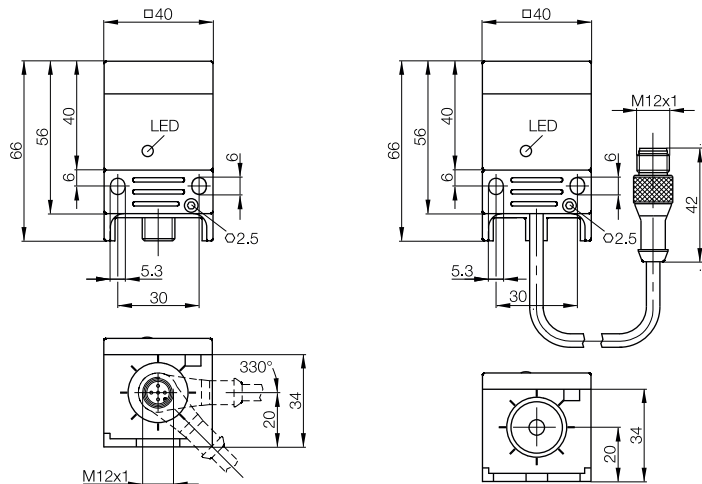
DC 2-wire Inductive Sensors

Block designs, 40×66×40 mm



Series		40×66×40 mm Unicomcompact	40×66×40 mm Unicomcompact
Installation type (observe instructions in 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_B		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

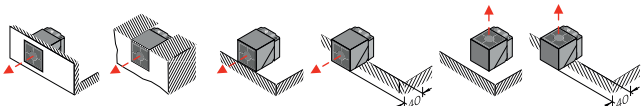
Connection-Switching diagram, see page 906
 The meaning of switching distance markings can be found on page 911



Unicomcompact

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 Unicomcompact

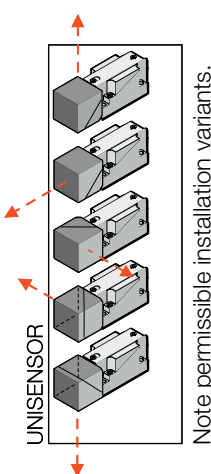


DC 2-wire Inductive Sensors

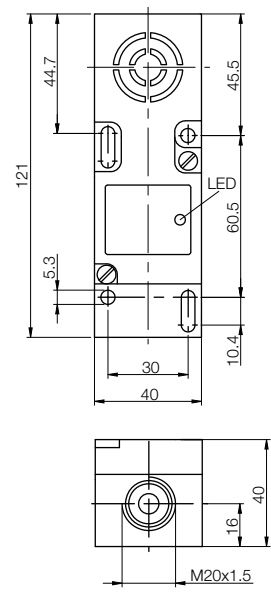
Block designs, 40×121×40 mm



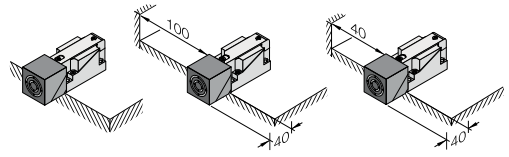
Series	40×121×40 mm Unisensor		Inductive sensors
Installation type (observe instructions in Basic Information chapter)	Not flush		
Rated switching distance s_n	20 mm		Global DC 3-wire
Assured switching distance s_a	0...16 mm		
Switching distance marking	■		DC 3-/4-wire
Polarized, complementary	Ordering code	BES0309	
	Part number	BES Q40KU-GPH20F-KM21	DC 2-wire
Supply voltage U_B	10...55 V DC		Cylinder designs
Voltage drop U_d at I_e max.	4.6 V		
Rated insulation voltage U_i (protection class)	250 V AC (II)		Block designs
Rated operating current I_e	400 mA		
Minimum operating current I_m	4 mA		AC/DC 2-wire
Residual current I_r max.	1 mA		
Permissible load capacitance max.	1 μ F		AC 2-wire
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes		
Ambient temperature T_a	-25...+80 °C		Special properties
Switching frequency f max.	300 Hz		
Output function indicator	Red LED		Analog distance measurement
Degree of protection as per IEC 60529	IP 65		
Approvals	CE		Accessories
Material	Housing	PPE	
	Sensing surface	PPE	
Connection	Screw terminal		



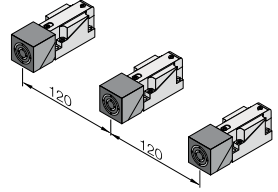
Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911



Mounting options



Row mounting



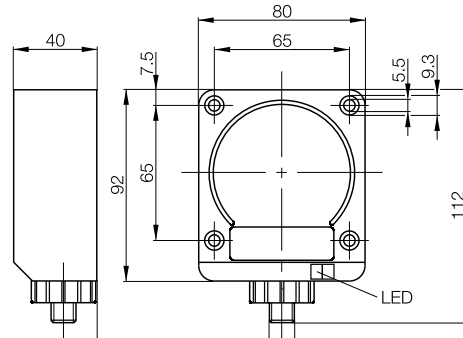
DC 2-wire Inductive Sensors

Block designs, 80×92×40 mm



Series	80×92×40 mm Maxisensor	
Installation type (observe instructions in 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_B	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 (II)	
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	

Connection-Switching diagram, see page 906
 The meaning of switching distance markings can be found on page 911

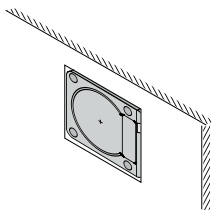


Maxisensor

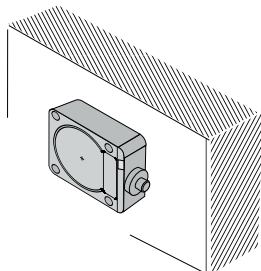
Long switching distance with low installation height in the detection direction. Ideal for equipment manufacturing and conveyor technology.

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.

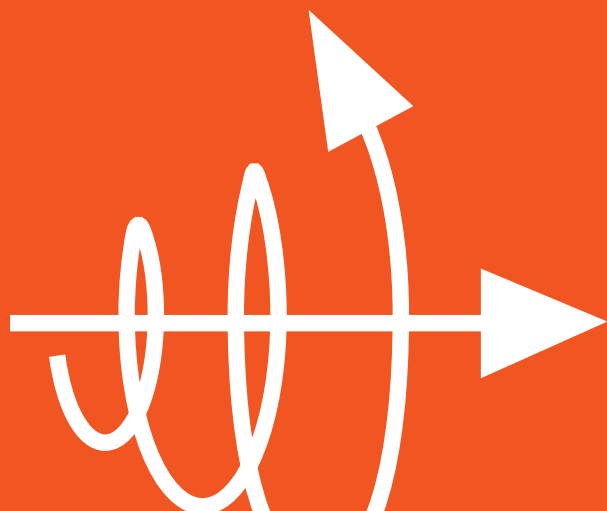


DC 2-wire Inductive Sensors

Block designs, 80×92×40 mm



			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



Inductive Sensors

AC/DC 2-wire inductive sensors

Our standard product line in 2-wire using AC/DC technology:

Balluff offers something for practically any application in automation with this comprehensive product line of sensors from M12 to 80x80 mm. 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	554
M18×1	556
M30×1.5	559

Block designs

26×40×12 mm (R05)	563
40×73×40 mm (Unicomact)	564
40×120×40 mm (Unisensor)	566
80×80×40 mm (Maxisensor)	570

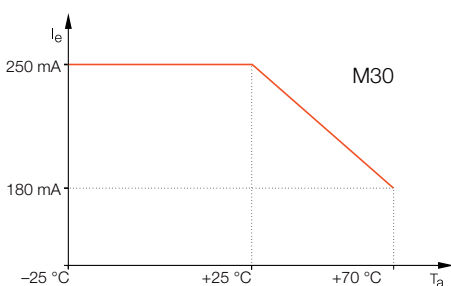
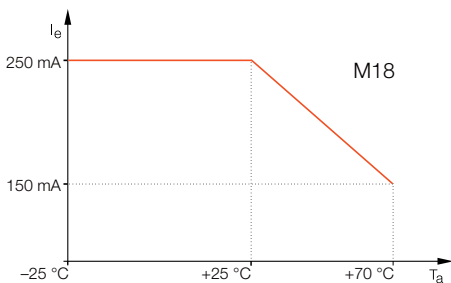
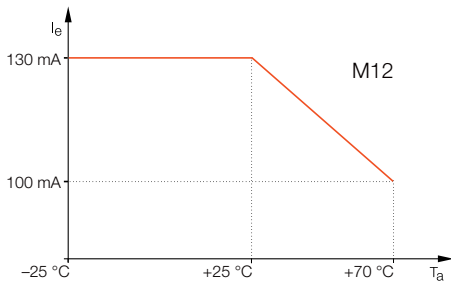


Basic information
and definitions
can be found
on **page 884**.





Current reduction as a function of ambient temperature range



Series	
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	
NO	Ordering code
	Part number
NC	Ordering code
	Part number
Rated operating voltage U_e	
Supply voltage U_B	
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	

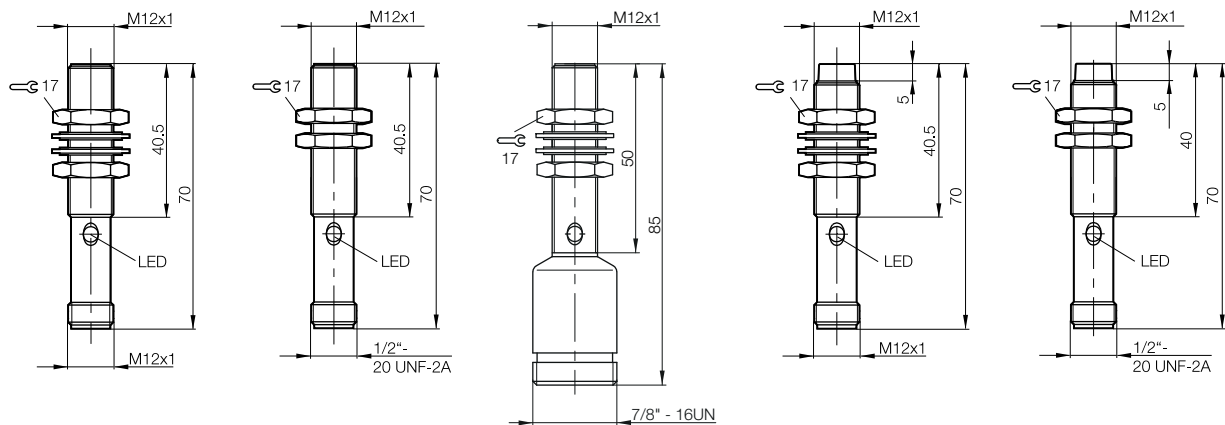
Connection-Switching diagram, see page 906
 The meaning of switching distance markings can be found on page 911

Cable versions (Insulation class 2) 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
■	■	■	■	■
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

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

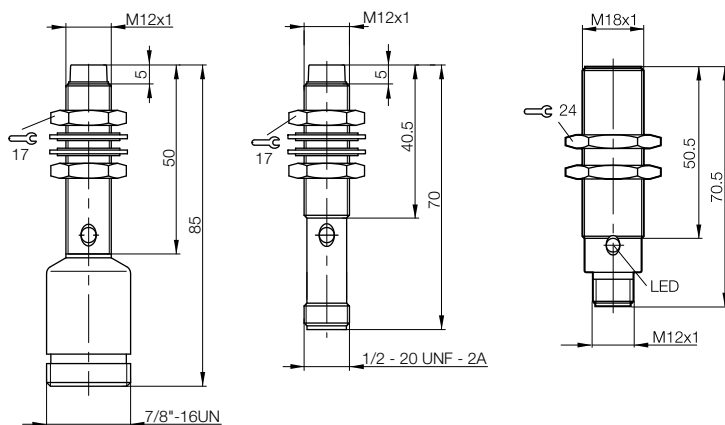
Cylinder design, M12x1, M18x1



Series	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	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 516-211-E5-E-S27
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_B	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	Stainless steel	Brass-coated
	Sensing surface: PA 12	PA 12	PA 12
Connection	7/8" 16UN plug connector, 3-pin	1/2"-20UNF-2A plug connector, 3-pin	M12 connector, 3-pin

Connection-Switching diagram, see page 906
 The meaning of switching distance markings can be found on page 911

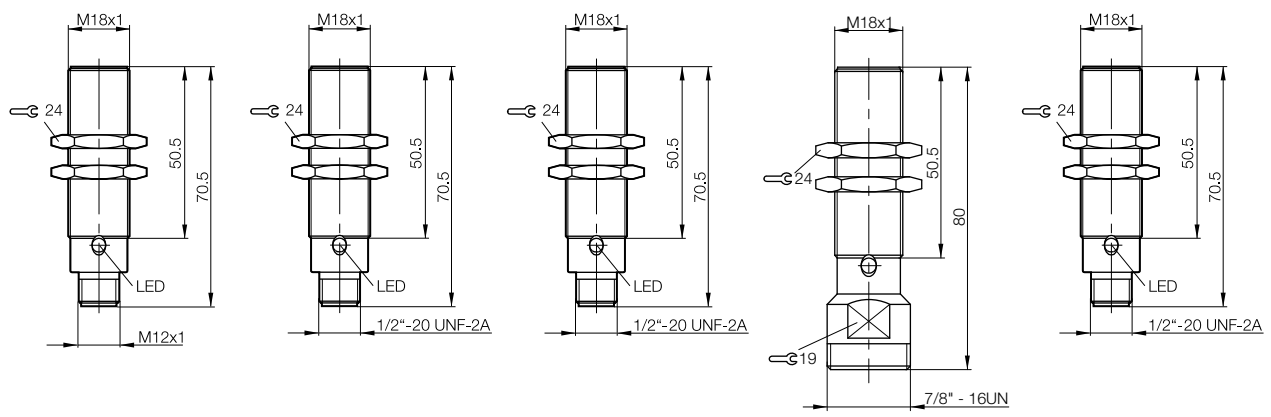
Cable versions (protection class 2) on request.





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

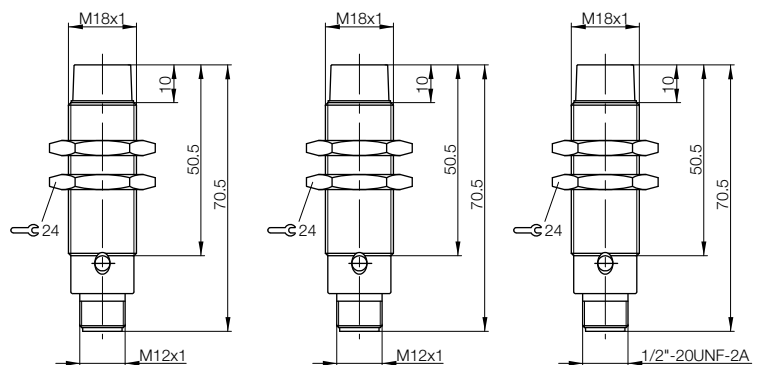
Cylinder design, M18x1



Series	M18x1	M18x1	M18x1
Installation type (pay attention to the note 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 Part number	BES0297 BES 516-213-E5-E-S27	BES02E8 BES 515-213-E5-E-S27
NC	Ordering code Part number	BES029J BES 516-214-E5-E-S27	BES0296 BES 516-213-E5-E-S21
Rated operating voltage U_e	110 V AC	110 V AC	110 V AC
Supply voltage U_B	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	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 Sensing surface: PA 12	Stainless steel PA 12	Brass-coated PA 12
Connection	M12 connector, 3-pin	M12 connector, 3-pin	1/2"-20UNF-2A plug connector, 3-pin

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

Cable versions (protection class 2) on request.

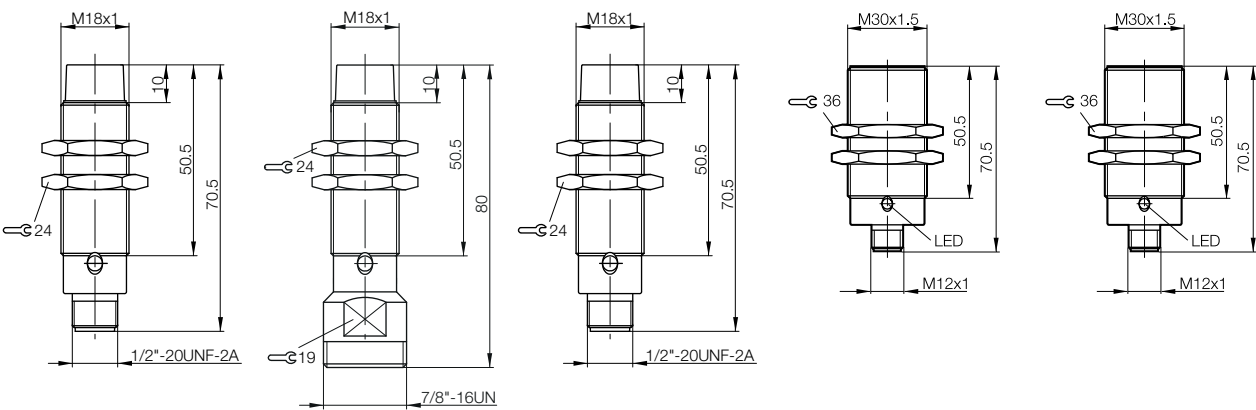




Inductive sensors
Global DC 3-wire
DC 3-/4-wire
DC 2-wire
AC/DC 2-wire
Cylinder designs
Block designs
AC 2-wire
Special properties
Analog distance measurement
Accessories



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



AC/DC 2-wire Inductive Sensors

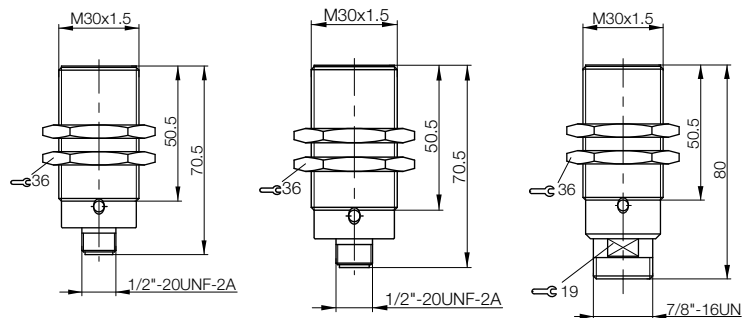
Cylinder design, M30x1.5



Series	M30x1.5	M30x1.5	M30x1.5
Installation type (pay attention to the note 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	BES029W
	Part number	BES 516-215-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_B	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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

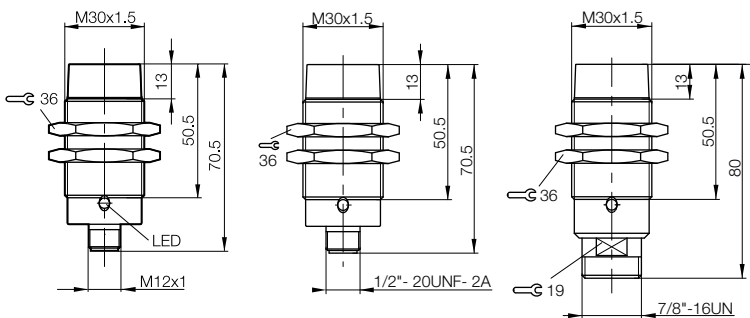
Cable versions (protection class 2) on request.





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		

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 Sensors in use

Position detection with inductive sensors BES – for the most possible safety: In foundry work, exact position detection is absolutely essential for pouring metal with exact precision. 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.



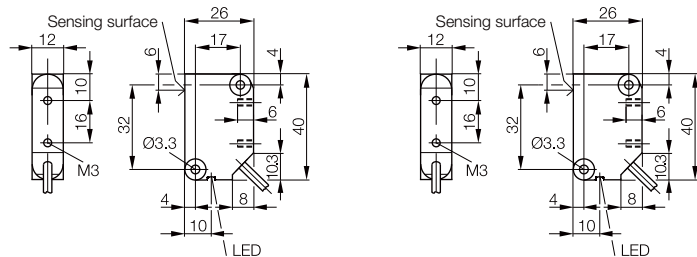


Series	26×40×12 mm R05	26×40×12 mm R05
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush
Rated switching distance s_n	2 mm	4 mm
Assured switching distance s_a	0...1.6 mm	0...3.2 mm
Switching distance marking	■	■■
NO	Ordering code	BES02CT
	Part number	BES R05KB-USU20B-EV02
Rated operating voltage U_o	110 V AC	110 V AC
Supply voltage U_B	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

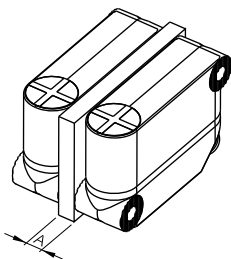
Inductive sensors
Global DC 3-wire
DC 3-/4-wire
DC 2-wire
AC/DC 2-wire
Cylinder designs
Block designs
AC 2-wire
Special properties
Analog distance measurement
Accessories

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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



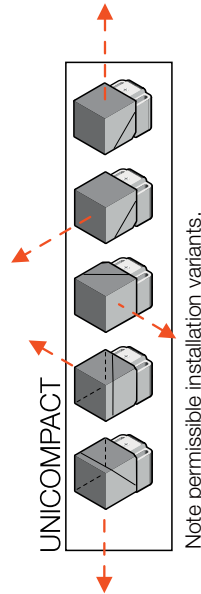
Row mounting



- 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

AC/DC 2-wire Inductive Sensors

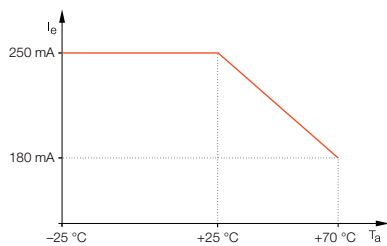
Block designs, 40x73x40 mm



Note permissible installation variants.

Series		
Installation type (observe instructions in 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_B		
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		

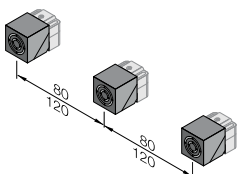
Current reduction as a function of ambient temperature range



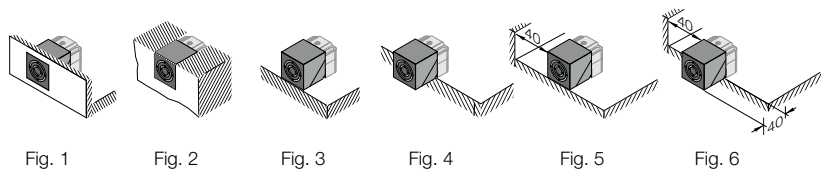
Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

Row mounting

Flush 80 mm, not flush 120 mm



Mounting options

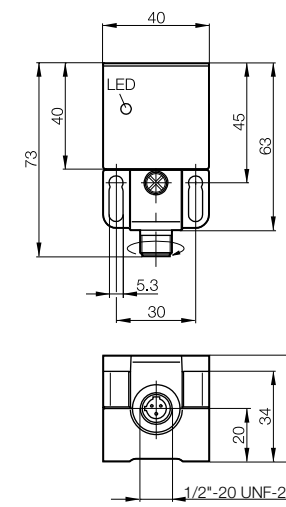
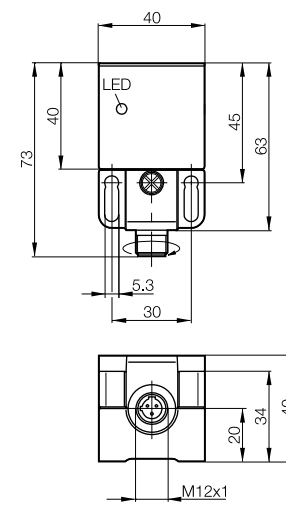
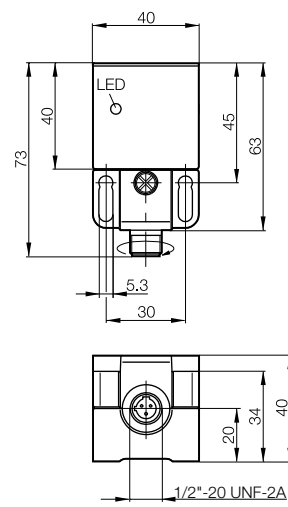
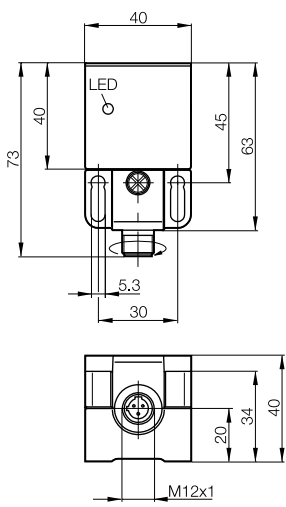




Inductive sensors
Global DC 3-wire
DC 3-/4-wire
DC 2-wire
AC/DC 2-wire
Cylinder designs
Block designs
AC 2-wire
Special properties
Analog distance measurement
Accessories



40×73×40 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

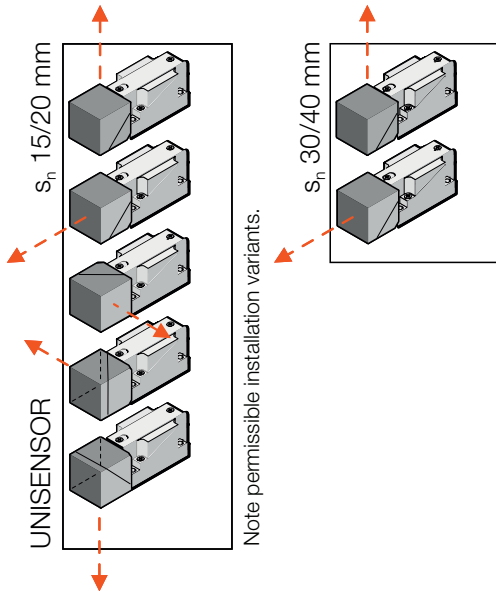


AC/DC 2-wire Inductive Sensors

Block designs, 40x120x40 mm

Programmable Unisensor

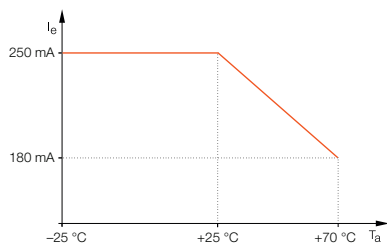
Unisensors can be switched between a normally open function- and a normally closed function. A wire jumper is used to change the setting.



Series	
Installation type (observe instructions in 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_B	
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	

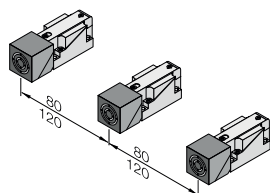
Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

Current reduction as a function of ambient temperature range

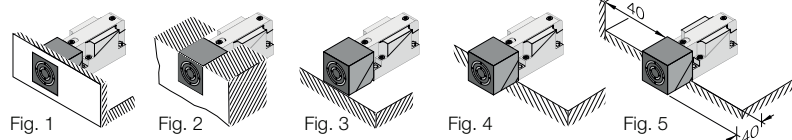


Row mounting

Flush 80 mm,
Not flush 120 mm



Mounting options

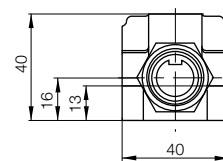
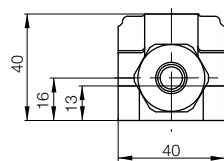
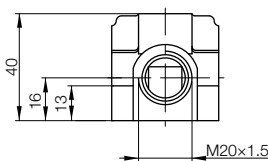
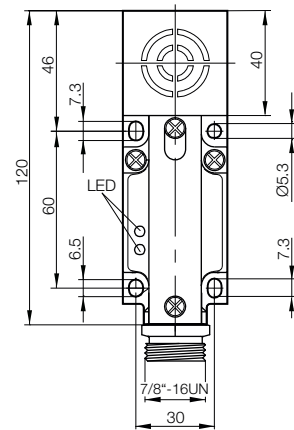
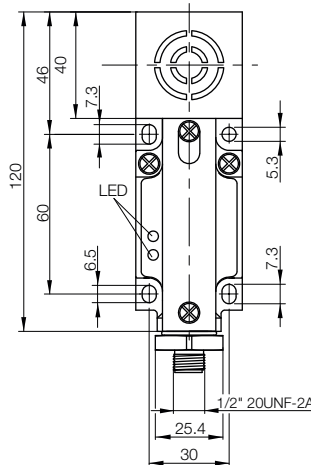
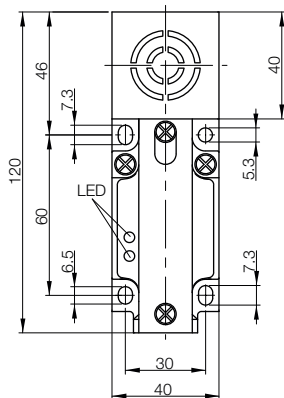


AC/DC 2-wire Inductive Sensors

Block designs, 40×120×40 mm



40×120×40 mm Unisensor	40×120×40 mm Unisensor	40×120×40 mm Unisensor	
Flush	Flush	Flush	Inductive sensors
15 mm	15 mm	15 mm	Global DC 3-wire
0...12 mm	0...12 mm	0...12 mm	
■	■	■	
BES020Y	BES0242	BES0243	DC 3-/4-wire
BES 517-223-M3-E	BES 517-223-U3-E-S21	BES 517-223-U3-E-S5	DC 2-wire
110 V AC	110 V AC	110 V AC	AC/DC 2-wire
20...250 V AC/DC	20...250 V AC/DC	20...250 V AC/DC	Cylinder designs
10.5 V	10.5 V	10.5 V	Block designs
250 V AC (□)	250 V AC	250 V AC	AC 2-wire
250 mA	250 mA	250 mA	Special properties
5 mA	5 mA	5 mA	Analog distance measurement
1.7 mA	1.7 mA	1.7 mA	Accessories
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	



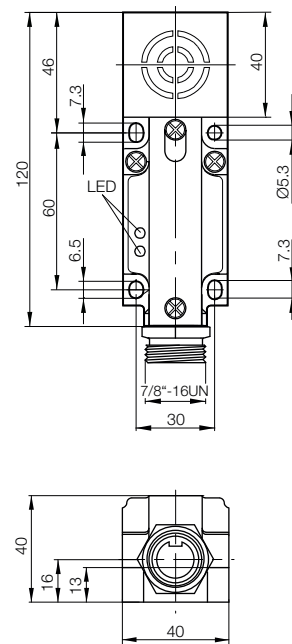
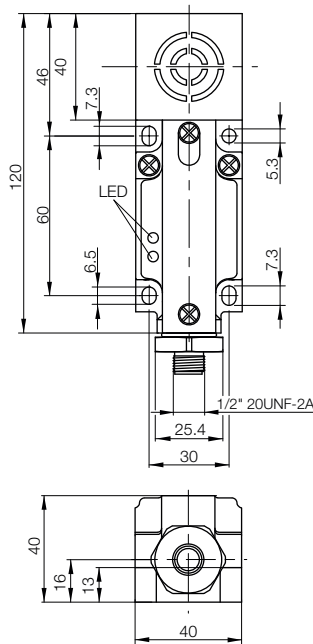
AC/DC 2-wire Inductive Sensors

Block designs, 40×120×40 mm



Series	40×120×40 mm Unisensor		40×120×40 mm Unisensor	
Installation type (observe instructions in 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_B	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	

Connection-Switching diagram, see page 906
 The meaning of switching distance markings can be found on page 911

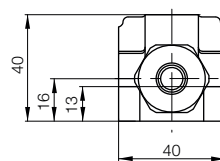
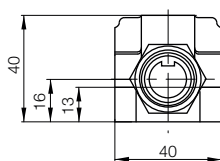
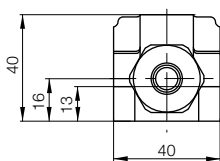
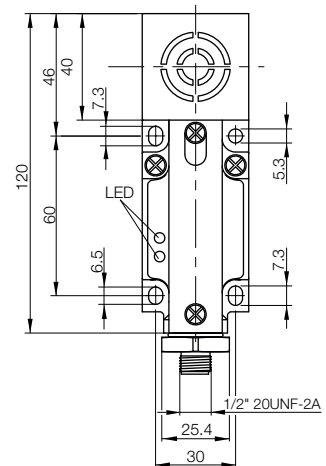
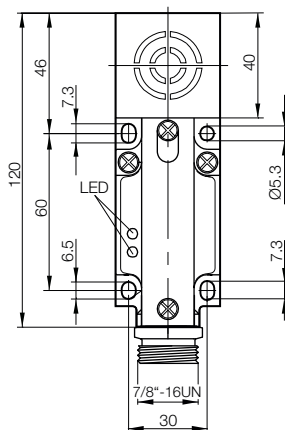
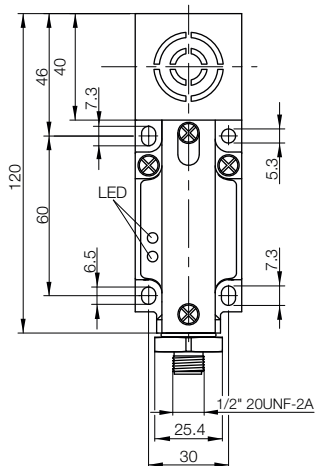


AC/DC 2-wire Inductive Sensors

Block designs, 40×120×40 mm



40×120×40 mm Unisensor	40×120×40 mm Unisensor	40×120×40 mm Unisensor	
Not flush	Not flush	Not flush	Inductive sensors
30 mm	30 mm	40 mm	Global DC 3-wire
0...24 mm	0...24 mm	0...32 mm	DC 3-/4-wire
■	■	■	DC 2-wire
BES0248	BES0249	BES024C	AC/DC 2-wire
BES 517-223-U5-E-S21	BES 517-223-U5-E-S5	BES 517-223-U7-EL-S21	Cylinder designs
110 V AC	110 V AC	110 V AC	Block designs
20...250 V AC/DC	20...250 V AC/DC	20...250 V	AC 2-wire
10.5 V	10.5 V	12.5 V	Special properties
250 V AC	250 V AC	250 V AC	Analog distance measurement
250 mA	250 mA	250 mA	Accessories
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	



AC/DC 2-wire Inductive Sensors

Block designs, 80×80×40 mm



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.

Series	
Installation type (observe instructions in 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_B	
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	

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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

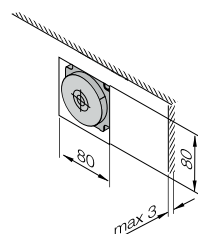


Fig. 1

Mounting in steel/non-ferrous metals

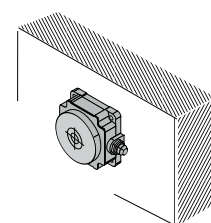


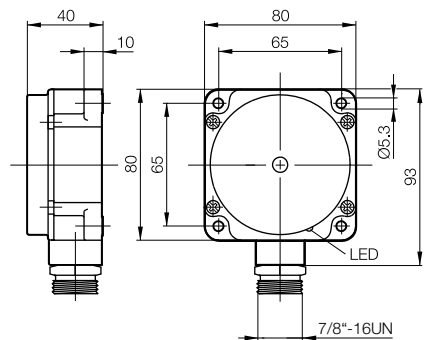
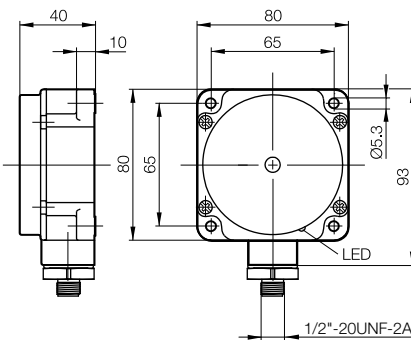
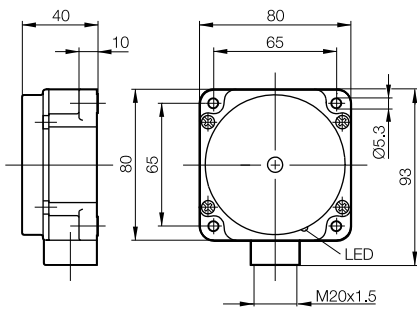
Fig. 2

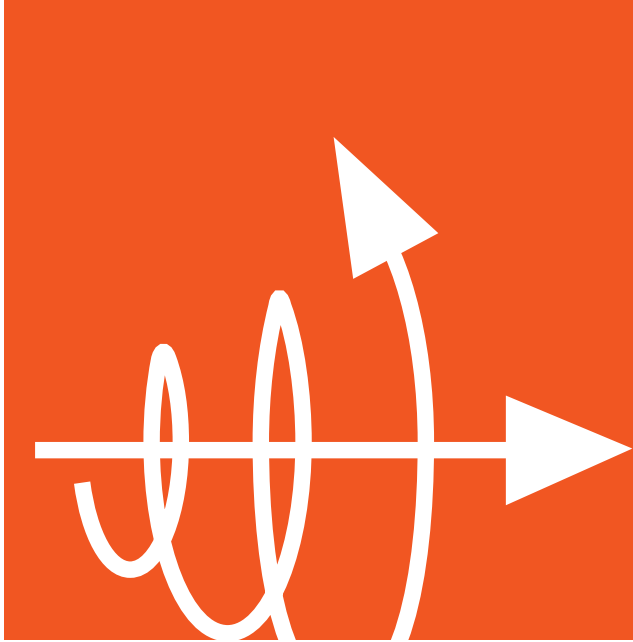
AC/DC 2-wire Inductive Sensors

Block designs, 80×80×40 mm



80×80×40 mm Maxisensor	80×80×40 mm Maxisensor	80×80×40 mm Maxisensor	
Not flush	Not flush	Not flush	Inductive sensors
50 mm	50 mm	50 mm	Global DC 3-wire
0...40.5 mm	0...40.5 mm	0...40.5 mm	DC 3-/4-wire
■	■	■	DC 2-wire
BES024F	BES023C	BES01ZJ	AC/DC 2-wire
BES 517-224-M5-E	BES 517-224-M5-E-S21	BES 517-224-U5-E-S5	Cylinder designs
110 V AC	110 V AC	110 V AC	Block designs
20...250 V AC/DC	20...250 V AC/DC	20...250 V AC/DC	AC 2-wire
11 V	11 V	11 V	Cylinder designs
250 V AC (□)	250 V AC (□)	250 V AC (□)	Block designs
250 mA	250 mA	250 mA	AC 2-wire
5 mA	5 mA	5 mA	Special properties
≤ 1.7 mA	1700 µA	1700 µA	Analog distance measurement
1 A/20 ms	1 A/20 ms	1 A/20 ms	Accessories
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

574

M18×1

576

M30×1.5

577

Block designs

80×80×40 mm (Maxisensor)

579



Basic information
and definitions
can be found
on **page 884**.



AC 2-wire Inductive Standard Sensors

Cylinder design, M12x1

AC-sensors are optimized for evaluation 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

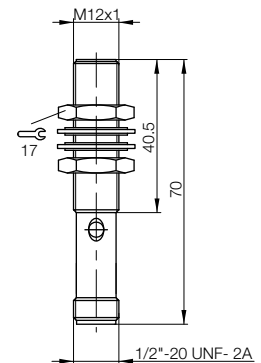
Short-circuit-protection equipment: Miniature fuse in accordance with IEC 60127-2 Sheet 1, ≤ 2 A (fast-acting). See attachment-Circuit diagrams. After a short-circuit, check the device for proper function.



Series	M12x1	
Installation type (observe instructions in Basic Information chapter)	Flush	
Rated switching distance s_n	2 mm	
Assured operating distance s_a	0...1.6 mm	
Switching distance marking	■	
NO	Ordering code	BES02CA
	Part number	BES 516-449-S21-L
Supply voltage U_B	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 range 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	

Connection-switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

Additional cable lengths on request.



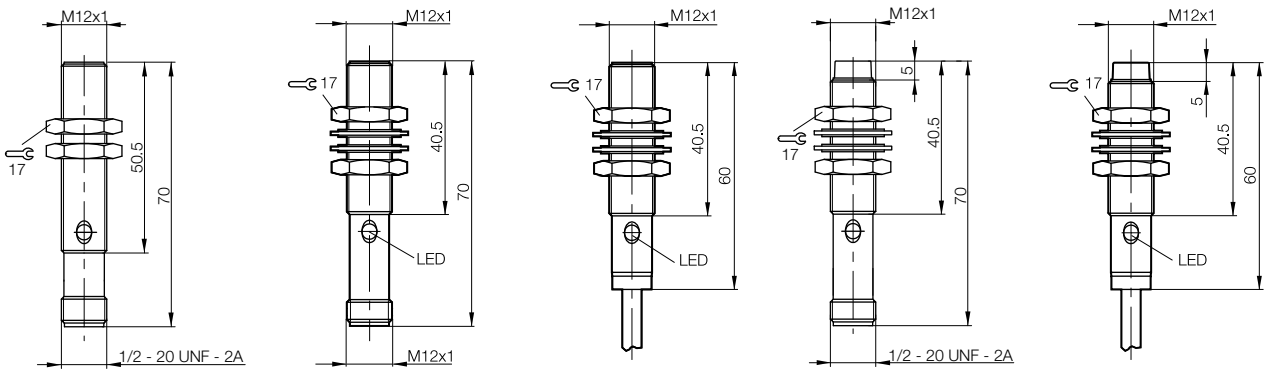
AC 2-wire Inductive Standard Sensors Cylinder designs, M12x1



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



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



AC 2-wire Inductive Standard Sensors

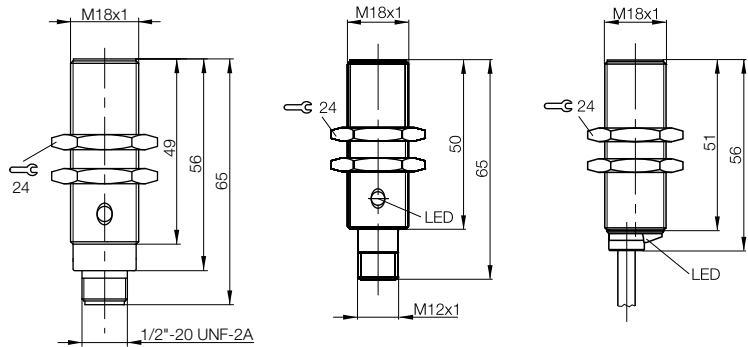
Cylinder designs, M18x1



Series	M18x1	M18x1	M18x1
Installation type (observe instructions in 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-S27	BES 516-420-E4-L-02
Rated operating voltage U_o	110 V	110 V	110 V
Supply voltage U_B	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 (II)	250 V AC	250 V AC (II)
Rated operating current I_o	500 mA	500 mA	500 mA
Polarity reversal/short-circuit protected	Yes/No	Yes/No	Yes/No
Ambient temperature range 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

Connection-switching diagram, see page 906
 The meaning of switching distance markings can be found on page 911

Additional cable lengths on request.



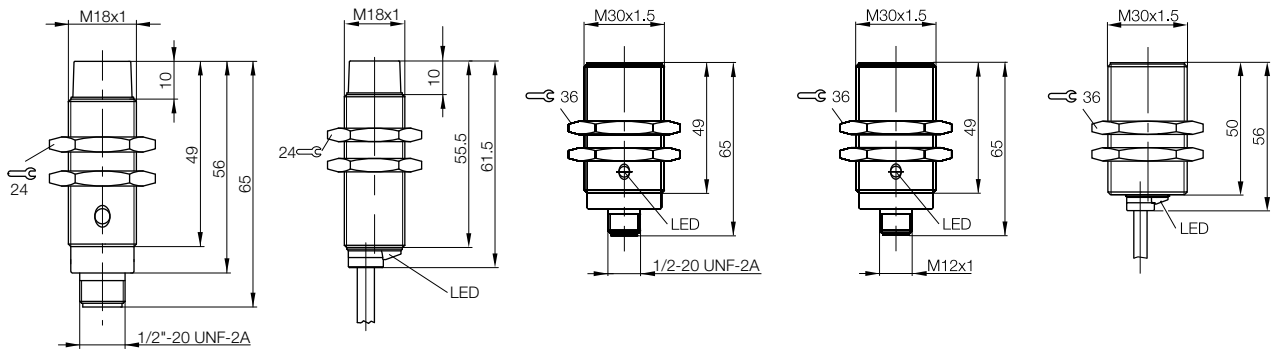
AC 2-wire Inductive Standard Sensors

Cylinder designs, M18x1, M30x1.5



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



AC 2-wire Inductive Standard Sensors

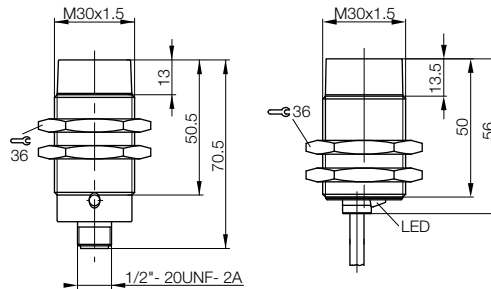
Cylinder designs, M30x1.5



Series		M30x1.5	M30x1.5	
Installation type (observe instructions in 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_B		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 range 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	

Connection-switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

Additional cable lengths on request.



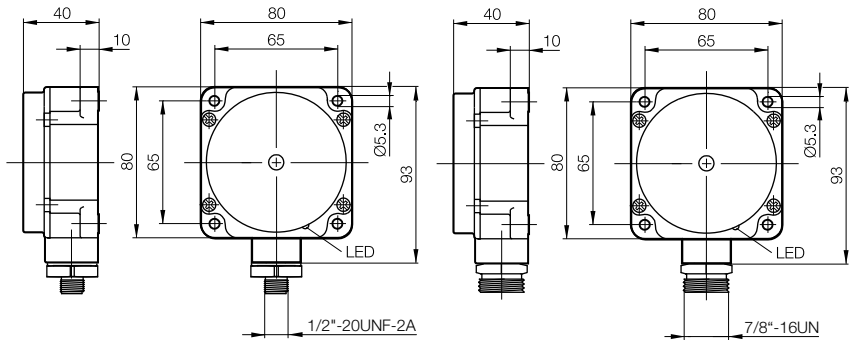
AC 2-wire Inductive Standard Sensors

Block designs, 80×80×40 mm



Series	80×80×40 mm Maxisensor		80×80×40 mm Maxisensor		
Installation type (observe instructions in Basic Information chapter)	Not flush		Not flush		Inductive sensors
Rated switching distance s_n	50 mm		50 mm		Global DC 3-wire
Assured switching distance s_a	0...40 mm		0...40 mm		DC 3-/4-wire
Switching distance marking	■		■		DC 2-wire
NO/NC; programmable	Ordering code	BES022T	BES022U		AC/DC 2-wire
	Part number	BES 517-460-U5-L-D-S21	BES 517-460-U5-L-D-S5		AC 2-wire
Supply voltage U_B	20...250 V AC		20...250 V AC		AC/DC 2-wire
Voltage drop U_d at I_e max.	7 V		7 V		AC 2-wire
Rated insulation voltage U_i (protection class)	250 V AC (□)		250 V AC (□)		Cylinder designs
Rated operating current I_e	500 mA		500 mA		Block designs
Polarity reversal/short-circuit protected	Yes/No		Yes/No		Special properties
Ambient temperature range T_a	-25...+70 °C		-25...+70 °C		Analog distance measurement
Switching frequency f max.	10 Hz		10 Hz		Accessories
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		

Connection-switching diagram, see page 906
The meaning of switching distance markings can be found on page 911



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

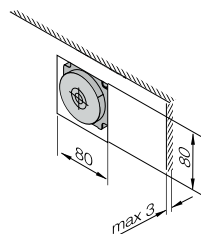


Fig. 1

Mounting in steel/non-ferrous metals

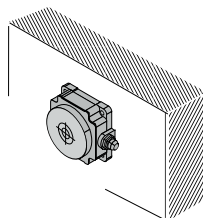
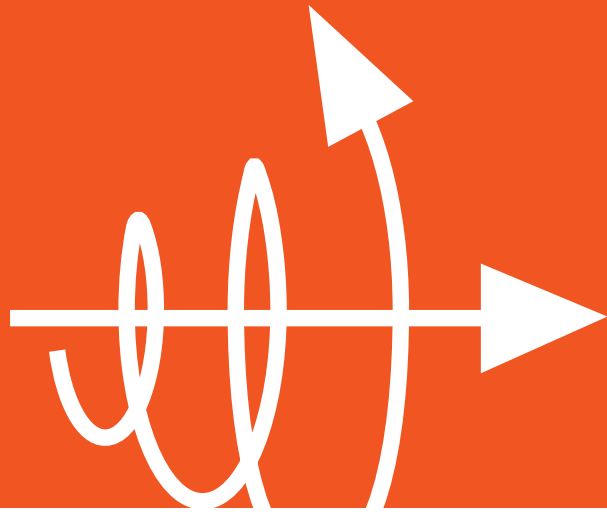


Fig. 2

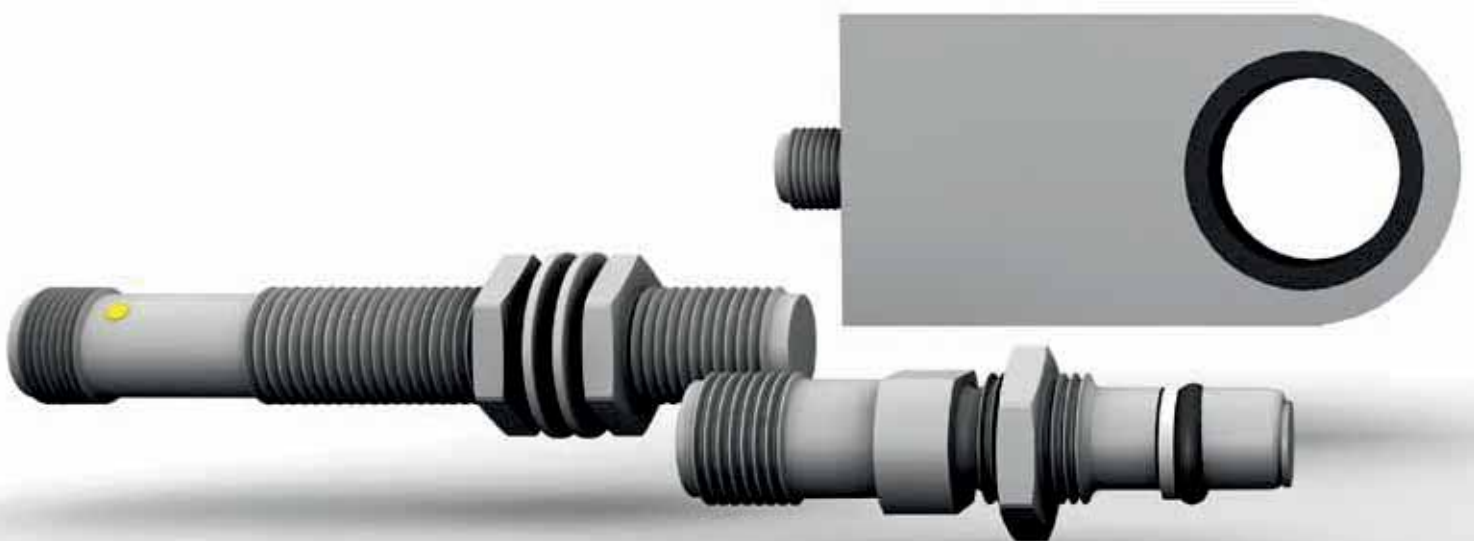


Inductive Sensors

Inductive sensors with special properties

Securely and reliably, our inductive sensors provide 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

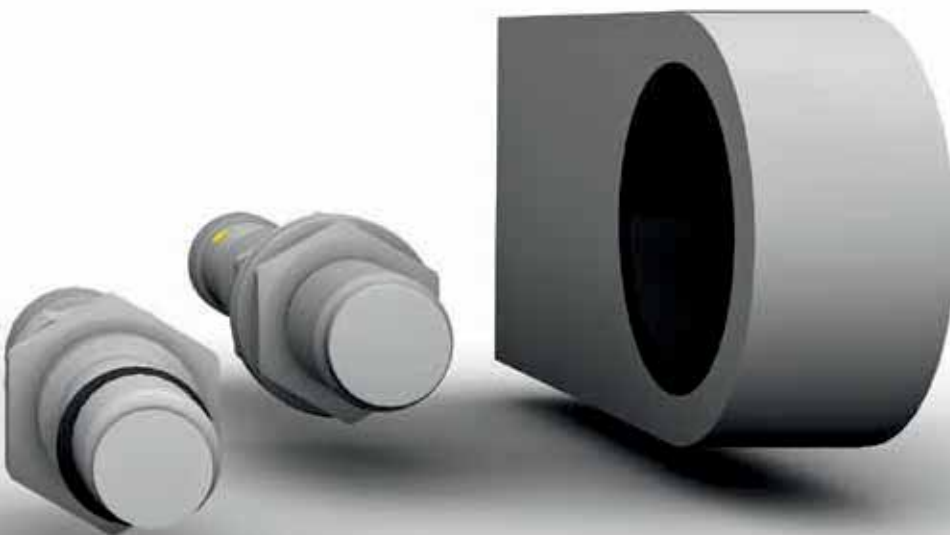
Contents

Inductive sensors with special properties

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Factor 1 sensors	626
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Basic information and definitions can be found on **page 884**.



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.

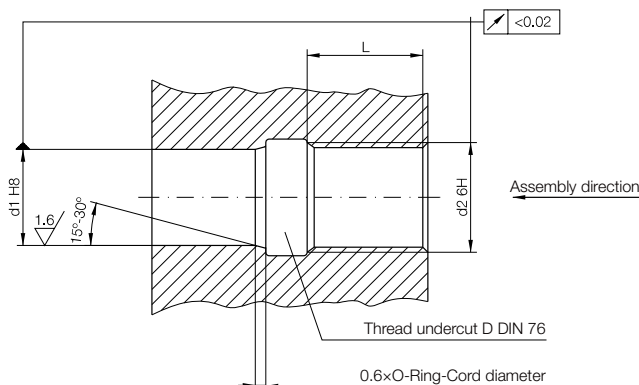


Size		
Installation type (pay attention to the note in the Basic Information chapter)		
Rated switching distance s_n		
Assured switching distance s_a		
Pressure range		
PNP, NO	Ordering code	
	Part number	
PNP, NC	Ordering code	
	Part number	
NPN, NO	Ordering code	
	Part number	
NPN, NC	Ordering code	
	Part number	
Supply voltage U_B		
Voltage drop U_d at I_e max.		
Rated insulation voltage U_i		
Rated operating current I_e		
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		

Connection-Switching diagram, see page 906

Additional cable lengths on request.

Installation instruction for high pressure rated sensors with O-ring



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

d_1 : \varnothing of the positioning hole for the switch head $\varnothing 10^{H8} = \varnothing 10^{+0.022}$

d_2 : 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

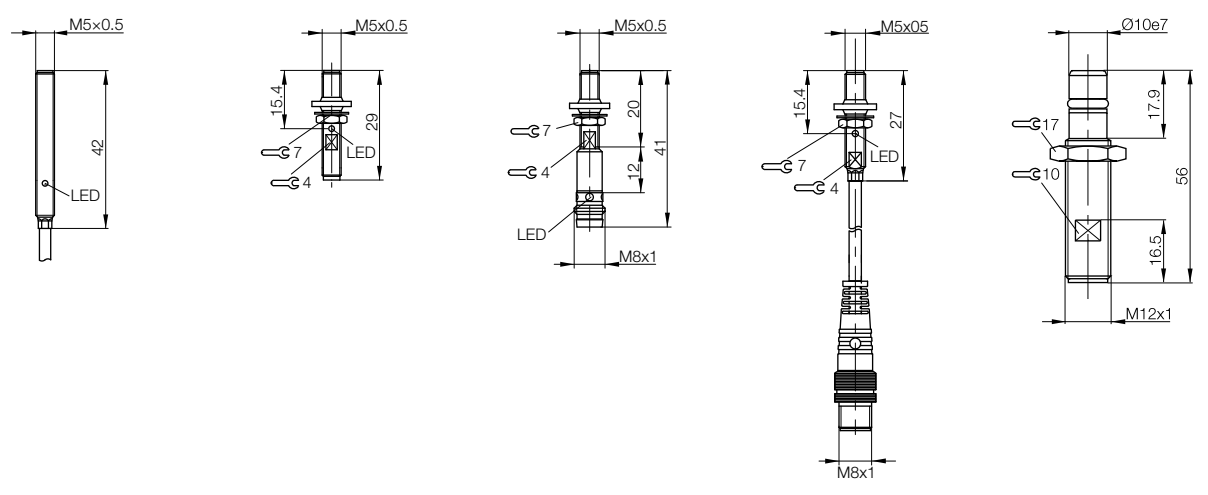
M5×0.5, M12×1



- Inductive sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special properties
- High pressure rated sensors**
- Ex sensors
- Steelface sensors
- High temperature rated sensors
- 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



M5×0.5	M5×0.5	M5×0.5	M5×0.5	M12×1
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
Oil pressure resistant up to 10 bar	Oil pressure resistant up to 20 bar	Oil pressure resistant up to 20 bar	Oil pressure resistant up to 20 bar	Oil pressure resistant up to 50 bar
BES03H6	BES03JN	BES03LT	BES03K8	BHS003A
BES M05EG-PSC08B-BP02	BES M05EC-PSC08B-S26G-R01	BES M05EC-PSC08B-S49G-R01	BES M05ED-PSC08B-BP00,3-GS49-R01	BES 516-300-S291-S4-D
	BES03JP	BES03LU	BES03K9	
	BES M05EC-POC08B-S26G-R01	BES M05EC-POC08B-S49G-R01	BES M05ED-POC08B-BP00,3-GS49-R01	
	BES03JP	BES03LW	BES03KA	
	BES M05EC-NSC08B-S26G-R01	BES M05EC-NSC08B-S49G-R01	BES M05ED-NSC08B-BP00,3-GS49-R01	
	BES03JT	BES03LY	BES03KC	
	BES M05EC-NOC08B-S26G-R01	BES M05EC-NOC08B-S49G-R01	BES M05ED-NOC08B-BP00,3-GS49-R01	
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	2 V
75 V DC	75 V DC	75 V DC	75 V DC	75 V DC
100 mA	100 mA	100 mA	100 mA	200 mA
Open collector	Open collector	Open collector	Open collector	150 kΩ
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...+80 °C
3 kHz	3 kHz	3 kHz	3 kHz	2 kHz
Yellow LED	Yellow LED	Yellow LED	Yellow LED	no
IP 67	IP 67	IP 67	IP 67	IP 68 per BWN Pr. 20
CE	CE	CE	CE	CE
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Ceramic	PBT	PBT	PBT	EP
	PA/10.4×3.5/178173	PA/10.4×3.5/178173	PA/10.4×3.5/178173	N70B200V/5.3×2.4 NBR/631753
				PTFE/5.3×2.4/705918
2 m PUR cable, 3×0.14 mm ²	M5 connector, 4-pin	M8 connector, 3-pin	0.3 m PUR cable with M8 connector, 3-pin	M12 connector, 3-pin





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_B		
Voltage drop U_d at I_e max.		
Rated insulation voltage U_i		
Rated operating current I_e		
Output resistance R_a		
Polarity reversal protected/transposition protected/short-circuit protected		
Ambient temperature T_a		
Switching frequency f max.		
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		

Connection-Switching diagram, see page 906

Additional cable lengths on request.

Inductive Sensors with Special Properties

High pressure rated sensors

M5×0.5, M12×1

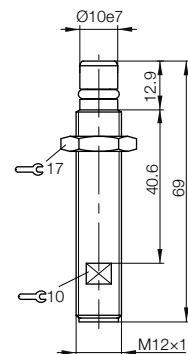
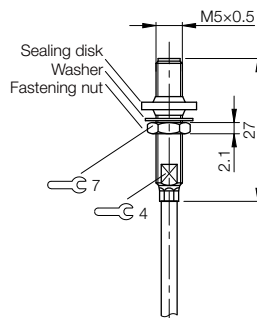
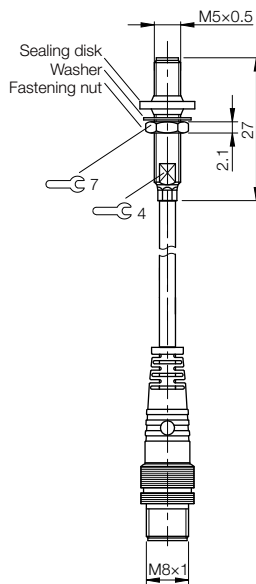


- Inductive sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special properties
- High pressure rated sensors
- Ex sensors
- Steelface sensors
- High temperature rated sensors
- Sensors for the food industry
- Factor 1 sensors
- Weld and magnetic field immune sensors
- Diagnostics sensors
- Large designs
- Ring sensors
- Hose sensors

- Analog distance measurement
- Accessories



M5×0.5	M5×0.5	M12×1
Flush	Flush	Flush
0.8 mm	0.8 mm	1.5 mm
0...0.65 mm	0...0.65 mm	0...1.2 mm
Oil pressure resistant up to 100 bar	Oil pressure resistant up to 100 bar	Oil pressure resistant up to 100 bar
BES03LC	BES03L7	BHS0035
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
3 V	3 V	2.5 V
75 V DC	75 V DC	75 V DC
100 mA	100 mA	200 mA
Open collector	Open collector	150 kΩ
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+70 °C	-25...+70 °C	-25...+80 °C
3 kHz	3 kHz	2 kHz
IP 67	IP 67	IP 68 per BWN Pr. 20
CE, cULus	CE, cULus	CE
Stainless steel	Stainless steel	Stainless steel
Ceramic	Ceramic	EP
N70B200V/5.3×2.4/178173	N70B200V/5.3×2.4/178173	N70B200V/5.3×2.4/631753
0.3 m PUR cable with M8 connector, 3-pin	2 m PUR cable, 3×0.14 mm ²	PTFE/5.3×2.4 M12 connector, 3-pin



Inductive Sensors with Special Properties

High pressure rated sensors

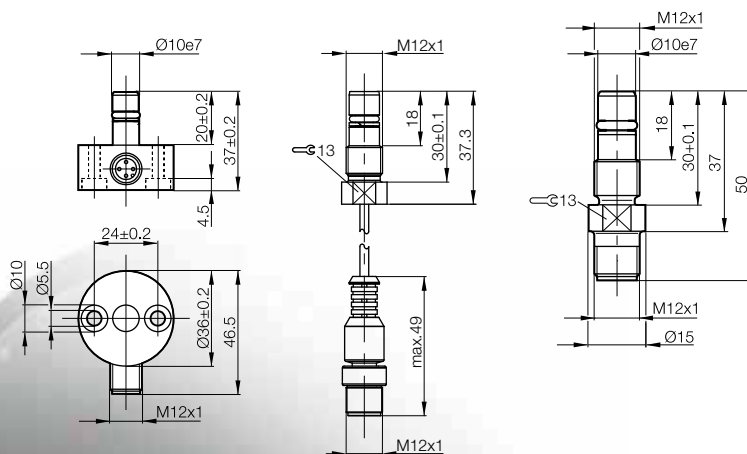
Ø 10 mm, M12x1

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	BHS007E	BHS004T
	Part number	BES 516-300-S205-D-S4-00,3	BES 516-300-S324-S4-D
Supply voltage U_B	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	2 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	Stainless steel
	Sensing surface EP	EP	EP
Sealing ring material/size/replacement part number	FPM 70/5.85x2.4/636594	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, 3-pin	0.3 m PUR cable with M12 connector, 3-pin	M12 connector, 4-pin

Connection-Switching diagram, see page 906



Inductive Sensors with Special Properties

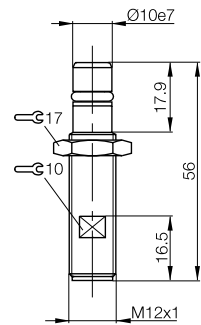
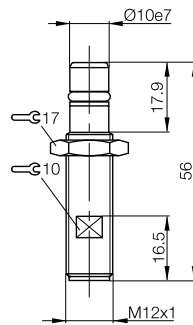
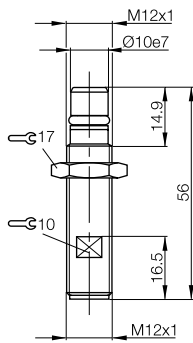
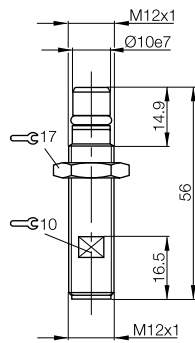
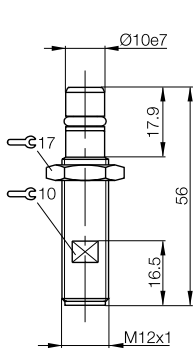
High pressure rated sensors

M12x1



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 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
BHS004P	BHS004R	BES042L	BES042M	BHS007C
BES 516-300-S322-S4-D	BES 516-300-S323-S4-D	BES 516-300-S338-S4-D	BES 516-300-S337-S4-D	BES 516-300-S341-S4-D
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	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	200 mA	200 mA
150 kΩ	150 kΩ	150 kΩ	150 kΩ	150 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	0...+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	FPM 70/5.85x2.4/636594	FPM 70/5.85x2.4/636594	FPM 70/5.85x2.4/636594
PTFE/5.3x2.4/705918	PTFE/5.3x2.4/705918	PTFE/5.3x2.4/705918	PTFE/5.3x2.4/705918	PTFE/5.3x2.4/705918
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

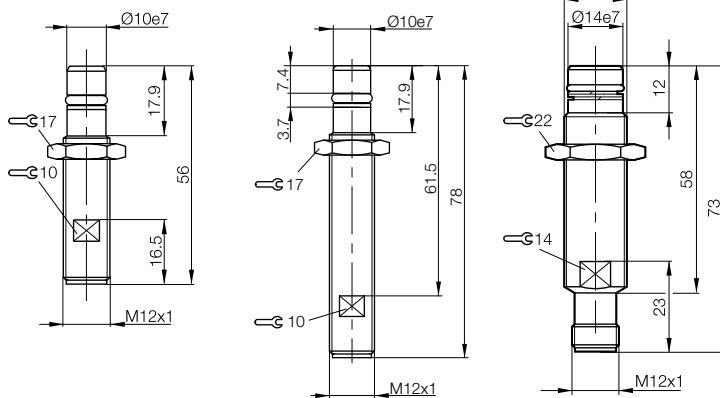
- Inductive sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special properties
- High pressure rated sensors**
- Ex sensors
- Steelface sensors
- High temperature rated sensors
- Sensors for the food industry
- Factor 1 sensors
- Weld and magnetic field immune sensors
- Diagnostics sensors
- Large designs
- Ring sensors
- Hose sensors
- Analog distance measurement
- Accessories





Size	M12x1	M12x1	M16x1
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	BHS007F	BHS004N
	Part number	BES 516-300-S322-E1-S4-D	BES 516-300-S321-S4-D
PNP, NC	Ordering code		BHS001T
	Part number		BES 516-300-S149-S4-D
Supply voltage U_B	10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.	3 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	FPM 70/5.85x2.4/636594	FPM 70/5.85x2.4/636594	NBR 60-80/11.0x1.5/709137
Supporting ring material/size/replacement part number	PTFE/5.3x2.4/705918	PTFE/5.3x2.4/705918	PTFE/14x11.6x1.5/709136
Connection	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

Connection-Switching diagram, see page 906



Inductive Sensors with Special Properties

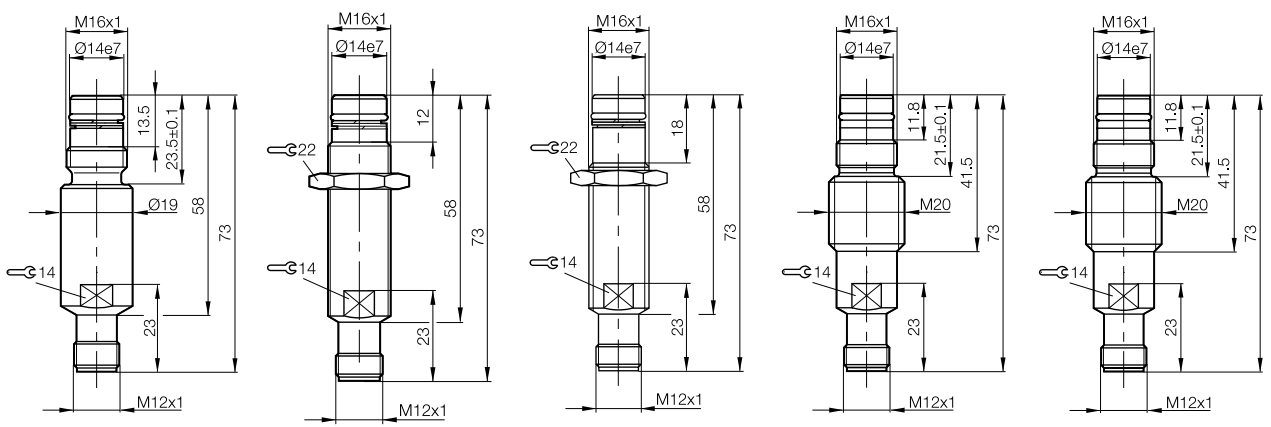
High pressure rated sensors

M16x1



M16x1	M16x1	M16x1	M16x1	M16x1
Flush	Flush	Flush	Flush	Flush
1.5 mm	1.5 mm	1.5 mm	1.5 mm	2.5 mm
0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm	0...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
BHS001E	BHS001W		BHS001C	
BES 516-300-S129-S4-D	BES 516-300-S152-S4-D		BES 516-300-S128-S4-D	
		BHS001Y		BHS004U
		BES 516-300-S156-S4-D		BES 516-300-S328-S4-D
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
1.5 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
33 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	-10...+80 °C
1 kHz	1 kHz	1 kHz	1 kHz	500 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	EP	EP	EP
NBR 60-80/11.0x1.5/709137	NBR 60-80/11.0x1.5/709137	NBR 60-80/11.0x1.5/709137	NBR 60-80/11.0x1.5/709137	NBR 60-80/11.0x1.5/709137
PTFE/14x11.1x0.7/505953	PTFE/14x11.1x0.7/505953	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

- Inductive sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special properties
- High pressure rated sensors**
- Ex sensors
- Steelface sensors
- High temperature rated sensors
- 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

High pressure rated sensors

M18x1, M22x1.5, M5x0.5

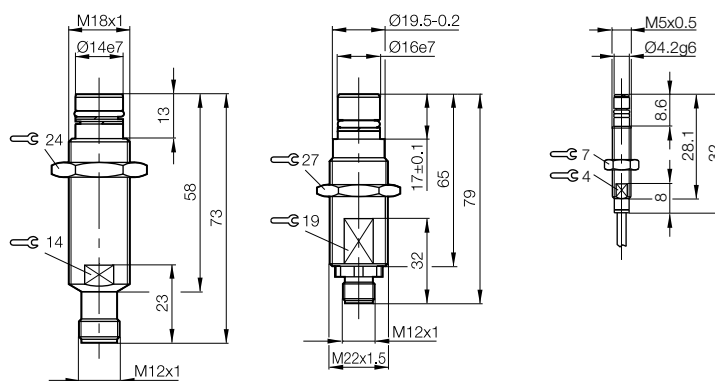
350 bar up to 500 bar



Size	M18x1	M22x1.5	M5x0.5
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush	Flush
Rated switching distance s_n	1.5 mm	3 mm	1 mm
Assured switching distance s_a	0...1.2 mm	0...2.1 mm	0...0.8 mm
Pressure range	Oil pressure resistant up to 350 bar	Oil pressure resistant up to 350 bar	Oil pressure resistant up to 500 bar
PNP, NO	Ordering code Part number	BHS0036 BES 516-300-S271-S4	BHS006U BHS G409N-PSD10-EP02
PNP, NC	Ordering code Part number		BHS006W BHS G409N-POD10-EP02
NPN, NO	Ordering code Part number		BHS006Y BHS G409N-NSD10-EP02
Supply voltage U_B	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	75 V DC	75 V DC	75 V DC
Rated operating current I_e	200 mA	200 mA	100 mA
Output resistance R_a	33 k Ω	4.7 k Ω	Open collector
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/No/No	Yes/No/Yes
Ambient temperature T_a	-25...+80 °C	0...+85 °C	-25...+80 °C
Switching frequency f max.	1 kHz	500 Hz	3 kHz
Output function indicator		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	CE	CE
Material	Housing: Stainless steel Sensing surface: EP	Housing: Stainless steel Sensing surface: POM	Housing: Stainless steel Sensing surface: ZrO ₂
Sealing ring material/size/replacement part number	NBR 60-80/11.0x1.5/709137	FPM 70/10.77x2.62/712143	NBR 70/2.35x1/154783
Supporting ring material/size/replacement part number	PTFE/14x11.1x0.7/505953	PTFE, 16x11.5x1.4/619072	PTFE/4.2x0.65x1/154782
Connection	M12 connector, 4-pin	M12 connector, 4-pin	2 m PUR cable, 3x0.1 mm ²

Connection-Switching diagram, see page 906

Additional cable lengths on request.



Inductive Sensors with Special Properties

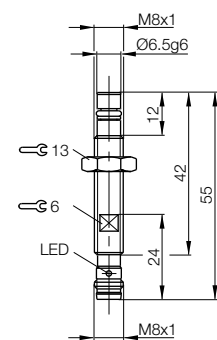
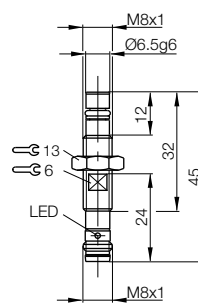
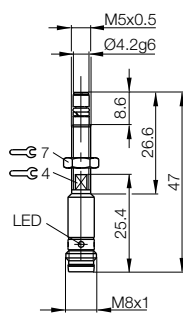
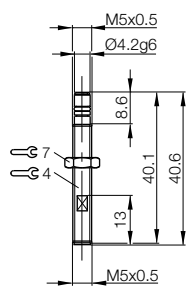
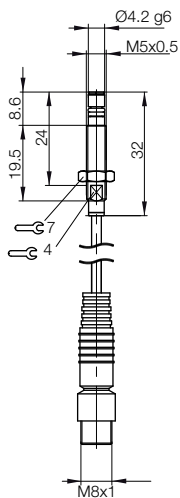
High pressure rated sensors

M5x0.5, M8x1



M5x0.5	M5x0.5	M5x0.5	M8 x 1	M8 x 1
Flush	Flush	Flush	Flush	Flush
1 mm	1 mm	1 mm	1.5 mm	1.5 mm
0...0.8 mm	0...0.8 mm	0...0.8 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
BHS007J	BHS006N	BHS005H	BHS0054	BHS0050
BHS G409N-PSD10-EP00,3-GS49	BHS G403N-PSD10-S26	BHS G408N-PSC10-S49	BHS A404N-PSC15-S49	BHS A402N-PSC15-S49
	BHS006P	BHS005F	BHS0053	BHS004Y
	BHS G403N-POD10-S26	BHS G408N-POC10-S49	BHS A404N-POC15-S49	BHS A402N-NSC15-S49
	BHS006R	BHS005E	BHS0052	BHS004Z
	BHS G403N-NSD10-S26	BHS G408N-NSC10-S49	BHS A404N-NSC15-S49	BHS A402N-POC15-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
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
Open collector	Open collector	Open collector	Open collector	Open collector
Yes/No/Yes	Yes/No/Yes	Yes/No/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-25...+80 °C	-25...+80 °C	-25...+80 °C	0...+80 °C	-25...+80 °C
3 kHz	3 kHz	3 kHz	4 kHz	4 kHz
		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 68 per BWN Pr. 20
CE	CE	CE	CE	CE
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
ZrO ₂	ZrO ₂	ZrO ₂	ZrO ₂	ZrO ₂
NBR 70/2.35x1/154783	NBR 70/2.35x1/154783	NBR 70/2.35x1/154783	NBR 70/4x1.5/154149	NBR 70/4x1.5/154149
PTFE/4.2x0.65x1/154782	PTFE/4.2x0.65x1/154782	PTFE/4.2x0.65x1/154782	PTFE/5.3x2.4/154150	PTFE/5.3x2.4/154150
0.3 m PUR cable with M8 connector, 3-pin	M5 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 rated sensors**
- Ex sensors
- Steelface sensors
- High temperature rated sensors
- Sensors for the food industry
- Factor 1 sensors
- Weld and magnetic field immune sensors
- Diagnostics sensors
- Large designs
- Ring sensors
- Hose sensors

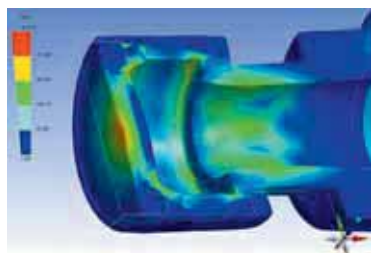
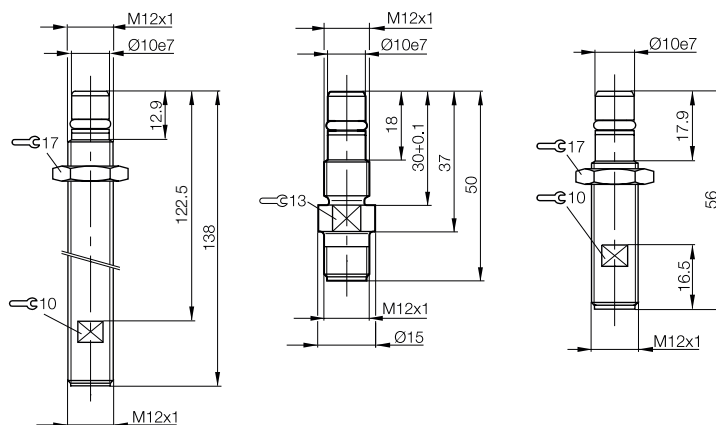


- Analog distance measurement
- Accessories

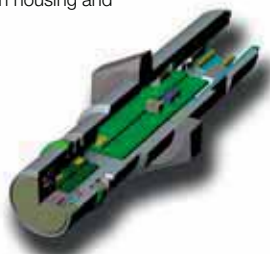


Size	M12x1	M12x1	M12x1
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush	Flush
Rated switching distance s_n	1.5 mm	1.5 mm	1.5 mm
Assured switching distance s_a	0...1.2 mm	0...1.2 mm	0...1.2 mm
Pressure range	Oil pressure resistant up to 500 bar	Oil pressure resistant 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_B	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
	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

Connection-Switching diagram, see page 906



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



Inductive Sensors with Special Properties

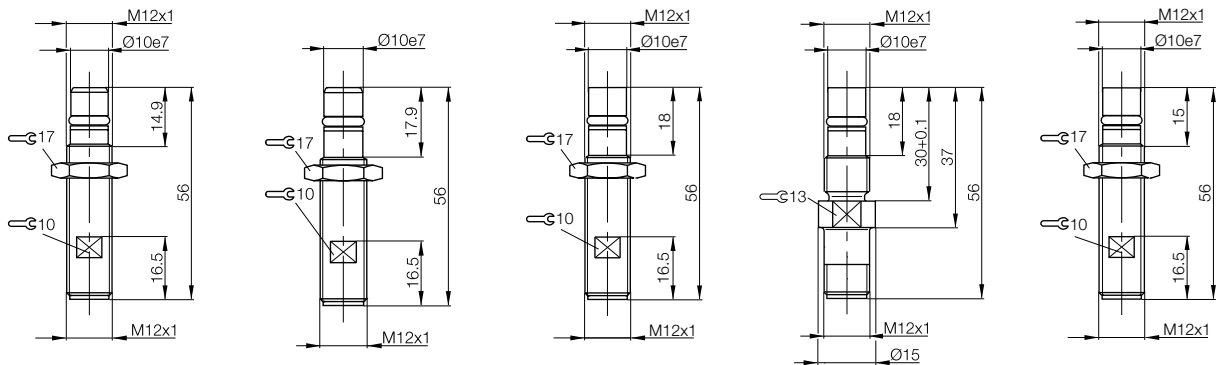
High-pressure resistant sensors

M12x1

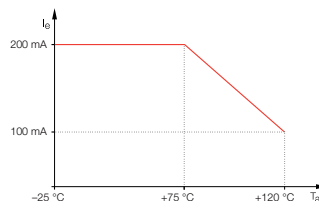


M12x1	M12x1	M12x1	M12x1	M12x1	M12x1
Flush	Flush	Flush	Flush	Flush	Flush
1.5 mm	1.5 mm	1.5 mm	1.5 mm	1.5 mm	1.5 mm
0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm
Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	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	

- Inductive sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special properties
- High pressure rated sensors**
- Ex sensors
- Steelface sensors
- High temperature rated sensors
- Sensors for the food industry
- Factor 1 sensors
- Weld and magnetic field immune sensors
- Diagnostics sensors
- Large design
- Ring sensors
- Hose sensors
- Analog distance measurement
- Accessories



*Current reduction as a function of ambient temperature range



Inductive Sensors with Special Properties

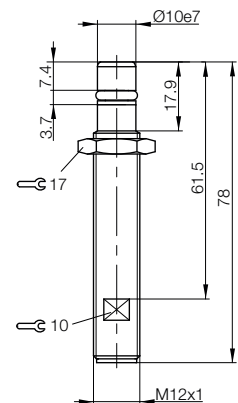
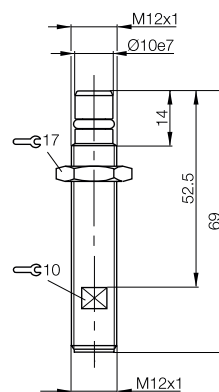
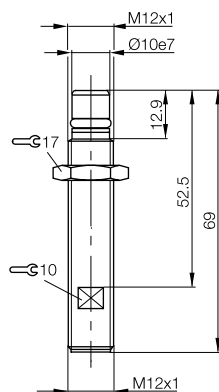
High-pressure resistant sensors M12x1

up to 500 bar



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_B	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 according to BWN PR. 20	IP 68 according to BWN PR. 20	IP 68 according to 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

Connection-Switching diagram, see page 906



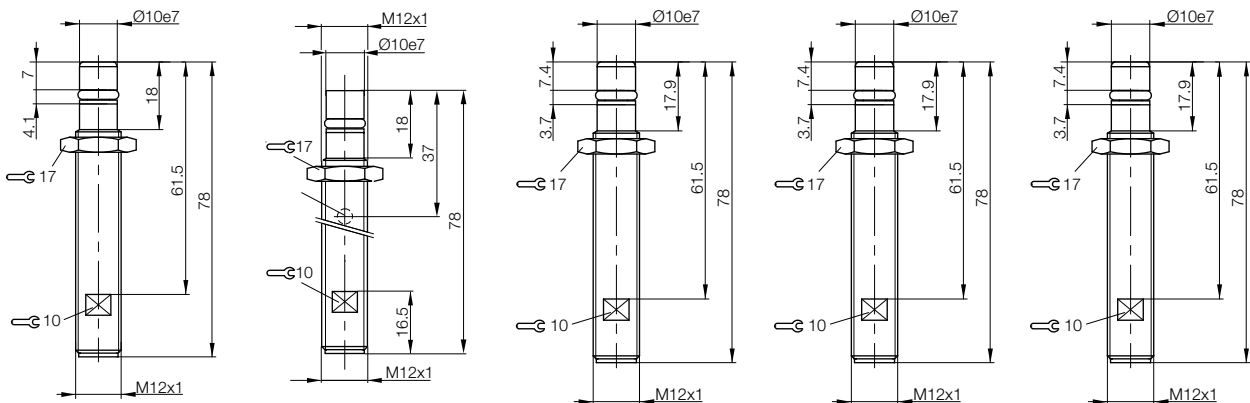
Inductive Sensors with Special Properties

High-pressure resistant sensors M12x1



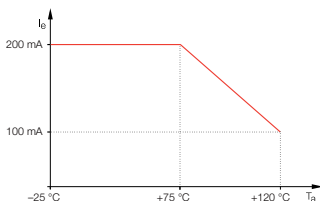
M12x1	M12x1	M12x1	M12x1	M12x1	M12x1
Flush	Flush	Flush	Flush	Flush	Flush
1.5 mm	1.5 mm	1.5 mm	1.5 mm	1.5 mm	1.5 mm
0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm
Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	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
		BHS0002	BHS0001		
		BES 516-100-S46-S4-D	BES 516-100-S45-S4-D		
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	2.5 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	75 V DC
200 mA	200 mA	200 mA	200 mA	200 mA	200 mA
33 kΩ	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	Yes/Yes/Yes
-25...+120 °C*	-25...+120 °C*	-25...+80 °C	-25...+80 °C	-25...+80 °C	-25...+80 °C
400 Hz	400 Hz	1 kHz	1 kHz	1 kHz	1 kHz
IP 68 according to BWN PR. 20 CE	IP 68 according to BWN PR. 20 CE	IP 68 according to BWN PR. 20 CE	IP 68 according to BWN PR. 20 CE	IP 68 according to BWN PR. 20 CE	IP 68 according to BWN PR. 20 CE
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Ceramic	Ceramic	EP	EP	EP	EP
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 70/5.85x2.4/636594	FPM 70/5.85x2.4/636594
PTFE/10x7.0x1.8/150229	PTFE/10x7.0x1.8/150229	PTFE/5.3x2.4/705918	PTFE/5.3x2.4/705918	PTFE/5.3x2.4/705918	PTFE/5.3x2.4/705918
M12 connector, 4-pin	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 rated sensors**
- Ex sensors
- Steelface sensors
- High temperature rated sensors
- Sensors for the food industry
- Factor 1 sensors
- Weld and magnetic field immune sensors
- Diagnostics sensors
- Large design
- Ring sensors
- Hose sensors



- Analog distance measurement
- Accessories

***Current reduction as a function of ambient temperature range**



Inductive Sensors with Special Properties

High-pressure resistant sensors

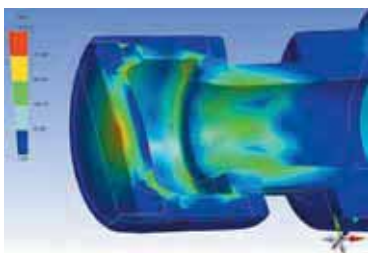
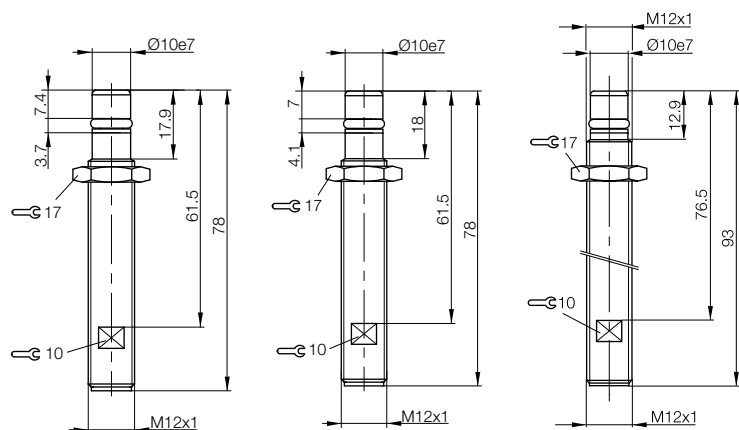
M12x1

up to 500 bar

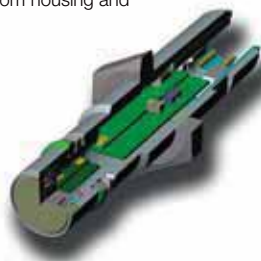


Size	M12x1	M12x1	M12x1
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush	Flush
Rated switching distance s_n	1.5 mm	1.5 mm	1.5 mm
Assured switching distance s_a	0...1.2 mm	0...1.2 mm	0...1.2 mm
Pressure range	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar
PNP, NO	Ordering code Part number		BHS0022 BES 516-300-S163-S4-D
PNP, complementary		BHS0076 BHS B135V-PAD15-S04-007	
NPN, NO	Ordering code Part number		
Supply voltage U_B	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	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...+85 °C	-25...+80 °C
Switching frequency f max.	1 kHz	1.5 kHz	1 kHz
Degree of protection as per IEC 60529	IP 68 according to BWN PR. 20	IP 68 according to BWN PR. 20	IP 68 according to BWN PR. 20
Approvals	CE	CE	CE
Material	Housing: Stainless steel Sensing surface: EP	Housing: Stainless steel Sensing surface: Ceramic	Housing: Stainless steel Sensing surface: EP
Sealing ring material/size/replacement part number	FPM 70/5.85x2.4/636594	FPM 80/6.75x1.78/149621	N70B200V/5.3x2.4/631753
Supporting ring material/size/replacement part number	PTFE/5.3x2.4/705918	PTFE/10x7.0x1.8/150229	PTFE/5.3x2.4/705918
Connection	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

Connection-Switching diagram, see page 906



Simulation (FEM-methods) of the voltage distribution under high pressure from housing and ceramic cap



Inductive Sensors with Special Properties

High-pressure resistant sensors

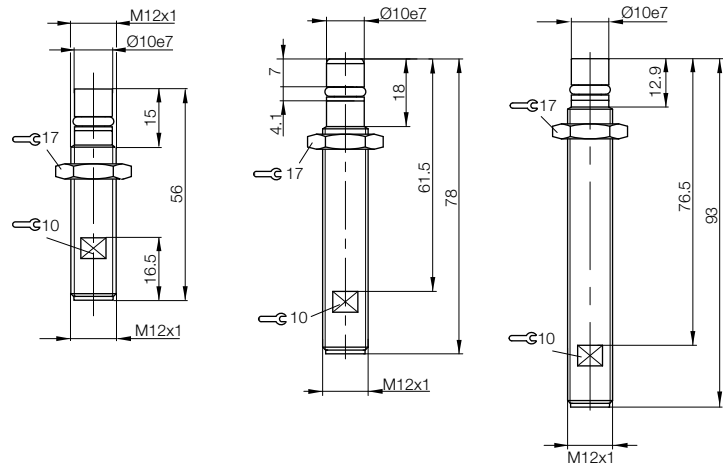
M12x1

up to 500 bar



Size	M12x1	M12x1	M12x1
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush	Flush
Rated switching distance s_n	2.5 mm	2.5 mm	2.5 mm
Assured switching distance s_a	0...2 mm	0...2 mm	0...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	BHS005U	BHS005W
	Part number	BHS B265V-PSD25-S04-003	BHS B135V-PSD25-S04-003
Supply voltage U_B	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	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...+90 °C	-25...+90 °C	-25...+90 °C
Switching frequency f max.	400 Hz	400 Hz	400 Hz
Degree of protection as per IEC 60529	IP 68 according to BWN PR. 20	IP 68 according to BWN PR. 20	IP 68 according to BWN PR. 20
Approvals	CE	CE	CE
Material	Housing: Stainless steel Sensing surface: Ceramic	Housing: Stainless steel Sensing surface: Ceramic	Housing: Stainless steel Sensing surface: Ceramic
Sealing ring material/size/replacement part number	FPM 80/6.75x1.78/149621	FPM 80/6.75x1.78/149621	FPM 80/6.75x1.78/149621
Supporting ring material/size/replacement part number	PTFE/10x7.0x1.8/150229	PTFE/10x7.0x1.8/150229	PTFE/10x7.0x1.8/150229
Connection	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

Connection-Switching diagram, see page 906



Inductive Sensors with Special Properties

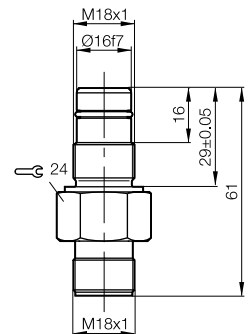
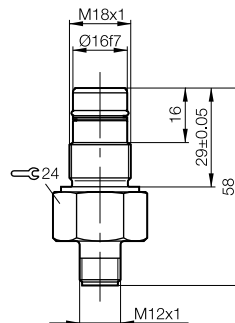
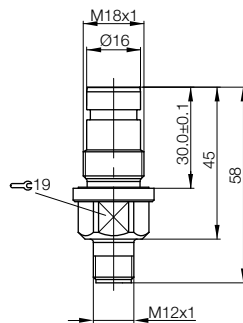
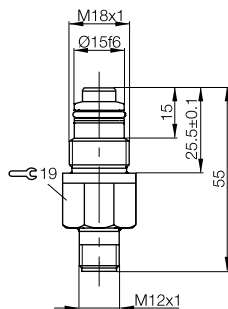
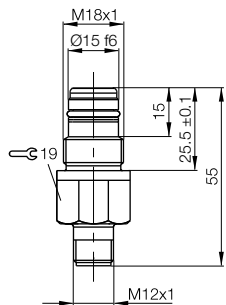
High pressure resistant sensors

M18x1



M18x1	M18x1	M18x1	M18x1	M18x1
Flush	Flush	Flush	Flush	Flush
1.5 mm	1.5 mm	3 mm	3 mm	3 mm
0...1.2 mm	0...1.2 mm	0...2.1 mm	0...2.1 mm	0...2.1 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
BHS004A	BHS004J	BHS0071	BHS0026	BHS0027
BES 516-300-S299-S4-D	BES 516-300-S308-S4-D	BES 516-300-S334-S4	BES 516-300-S190-S4	BES 516-300-S203
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
2 V	2 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
200 mA	200 mA	130 mA	130 mA	130 mA
150 kΩ	150 kΩ	2 kΩ	2 kΩ	4.7 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
2 kHz	2 kHz	400 Hz	400 Hz	1 kHz
IP 68 according to BWN PR. 20	IP 68 according to BWN PR. 20	IP 68 according to BWN PR. 20	IP 68 according to BWN PR. 20	IP 68 according to BWN PR. 20
CE	CE	CE	CE	CE
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
EP	EP	PEEK	PEEK	PEEK
NBR 60-80/12.42x1.78/642828	NBR 60-80/12.42x1.78/642828	NBR 85/15.7x20.9x1.5/179002	NBR 90/13.0x1.5/619531	NBR 90/13.0x1.5/619531
PTFE/15x12.2x0.7/642827	PTFE/15x12.2x0.7/642827		PTFE/16x13.8x0.5/635431	
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	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 rated sensors**
- Ex sensors
- Steelface sensors
- High temperature rated sensors
- Sensors for the food industry
- Factor 1 sensors
- Weld and magnetic field immune sensors
- Diagnostics sensors
- Large design
- Ring sensors
- Hose sensors
- Analog distance measurement
- Accessories



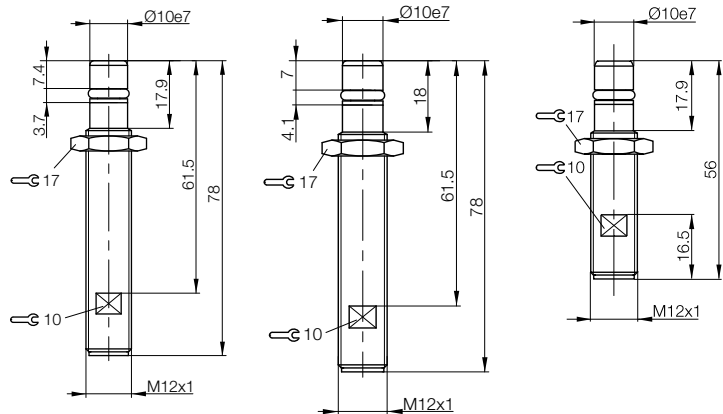
Inductive Sensors with Special Properties
High pressure rated sensors, EX protected
M12x1

up to 500 bar
EX



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 350 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar
PNP, NO	Ordering code	BHS0031	BHS002W
	Part number	BES 516-300-S321-NEX-S4-D	BES 516-300-S249-NEX-S4-D
Supply voltage U_B	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 according to BWN PR. 20	IP 68 according to BWN PR. 20	IP 68 according to 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	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

Connection-Switching diagram, see page 906



Sensors with ATEX approval Category 3G

Devices in this category are designed for use in areas where explosive atmospheres occur infrequently.

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

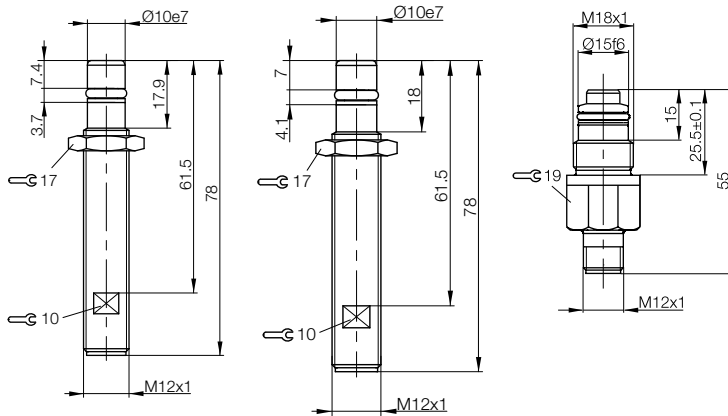
Inductive Sensors with Special Properties

High pressure rated sensors, Ex protected

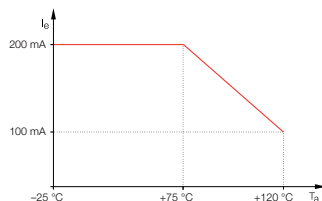
M12x1, M18x1



M12x1	M12x1	M18x1		
Flush	Flush	Flush		Inductive sensors
1.5 mm	1.5 mm	1.5 mm		Global DC 3-wire
0...1.2 mm	0...1.2 mm	0...1.2 mm		DC 3-/4-wire
Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar	Oil pressure resistant up to 500 bar		DC 2-wire
BHS001K	BHS005P	BHS004H		AC/DC 2-wire
BES 516-300-S135-NEX-S4-D	BHS B135V-PSD15-NEX-S04	BES 516-300-S308-NEX-S4-D		AC 2-wire
10...30 V DC	10...30 V DC	10...30 V DC		Special properties
1.5 V	2.5 V	2 V		High pressure rated sensors
75 V DC	75 V DC	75 V DC		Ex sensors
200 mA	200 mA	200 mA		Steelface sensors
33 kΩ	33 kΩ	150 kΩ		High temperature rated sensors
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes		Sensors for the food industry
-25...+80 °C	-25...+120 °C*	-25...+80 °C		Factor 1 sensors
1 kHz	400 Hz	2 kHz		Weld and magnetic field immune sensors
IP 68 according to BWN PR. 20	IP 68 according to BWN PR. 20	IP 68 according to BWN PR. 20		Diagnostics sensors
CE	CE	CE		Large design
Stainless steel	Stainless steel	Stainless steel		Ring sensors
EP	Ceramic	EP		Hose sensors
FPM 70/5.85x2.4/636594	FPM 80/6.75x1.78/149621	NBR 60-80/12.42x1.78/642828		Analog distance measurement
PTFE/5.3x2.4/705918	PTFE/10x7.0x1.8/150229	PTFE/15x12.2x0.7/642827		Accessories
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin		



*Current reduction as a function of ambient temperature range



Inductive Sensors with Special Properties

NAMUR, high pressure rated sensors, EX protected M12x1

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"

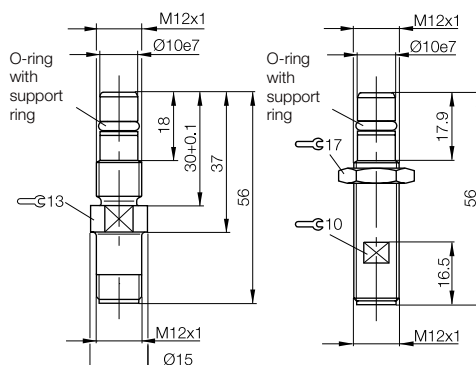


Size	M12x1	M12x1
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush
Rated switching distance s_n	1.5 mm	1.5 mm
Assured switching distance s_a	0...1.2 mm	0...1.2 mm
NAMUR	Ordering code	BHS004L
	Part number	BES 516-300-S318-S4-N
		BHS004K
		BES 516-300-S315-S4-N
Rated operating voltage U_o	8.2 V DC	8.2 V DC
Supply voltage U_B	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	Stainless steel
	Sensing surface POM	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-range

Conformity	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.



Inductive Sensors with Special Properties

NAMUR, isolating amplifiers

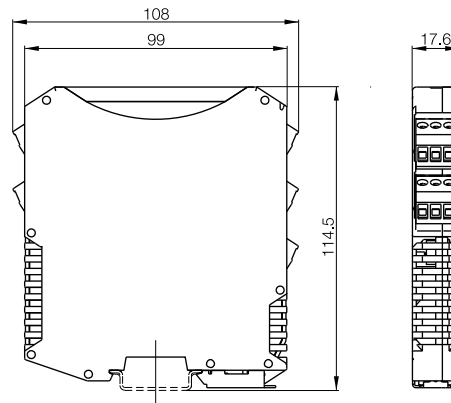


Size	99x17.6x114.5 mm	99x17.6x114.5 mm
Ordering code	FHW004P	FHW004R
Part number	STAHL 9170/20-12-11S	STAHL 9170/20-12-21S
Input	NAMUR-specification	NAMUR-specification
Output relay	2-channel, 1 converter Switching voltage 250 V AC Switching current 4 A AC Switching capacity 50 W/1000 VA	2-channel, 1 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_B	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

- Inductive sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special properties
- High pressure rated sensors
- Ex sensors
- Steelface sensors
- High temperature rated sensors
- Sensors for the food industry
- Factor 1 sensors
- Weld and magnetic field immune sensors
- Diagnostics sensors
- Large design
- Ring sensors
- Hose sensors
- Analog distance measurement
- Accessories

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).

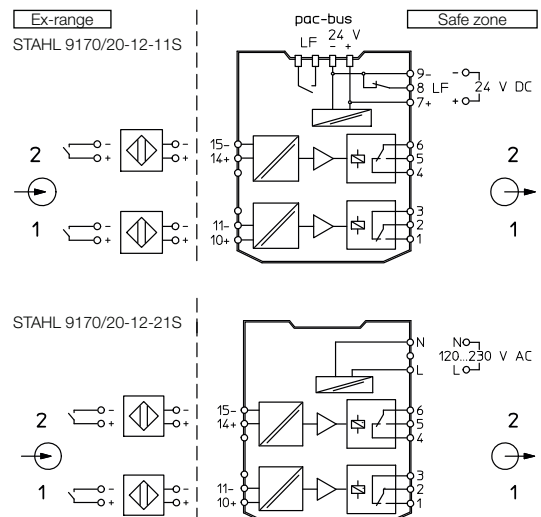
The input signals from NAMUR-sensors are converted using relay switching contacts-at the outputs. Input, output and auxiliary power circuits are galvanically isolated.

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.

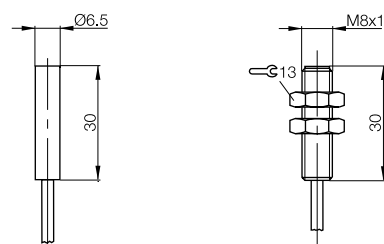
Ignition protection type  



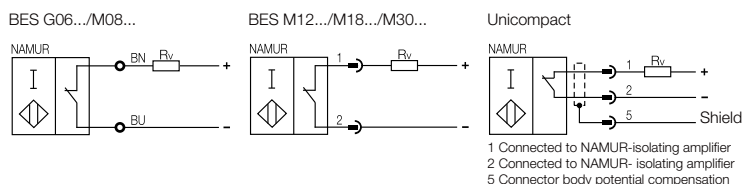
Size	Ø 6.5 mm	M8 x 1
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush
Rated switching distance s_n	1 mm	1 mm
Assured switching distance s_a	0.8 mm	0...0.8 mm
NAMUR	Ordering code	BES02ZR
	Part number	BES G06MD-GNX10B-EV02-EEX
		BES02ZT
		BES M08MD-GNX10B-EV02-EEX
Rated operating voltage U_e	8.2 V DC	8.2 V DC
Supply voltage U_B	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) ≤ 1 mA	self-locking (undamped) ≤ 1 mA
	conductive (damped) ≥ 2.1 mA	conductive (damped) ≥ 2.1 mA
Rated series resistance R_V	1 kΩ	1 kΩ
Polarity reversal protected	No*	no*
Ambient temperature T_a	-25...+70 °C	-25...+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: Brass-coated	Brass-coated
	Sensing surface: PBT	PBT
Possible installation variations		
Connection	2 m PVC cable, 2x0.14 mm ²	2 m PVC cable, 2x0.14 mm ²

Ex-range		
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



Wiring diagrams



Inductive Sensors with Special Properties

NAMUR, EX-protected

M12x1, M18x1, M30x1.5, 40x40 mm

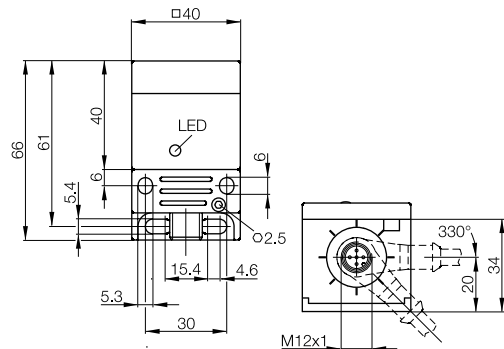
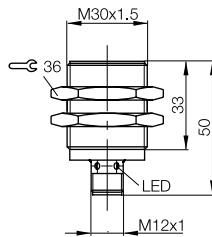
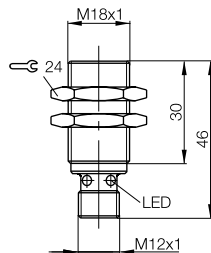
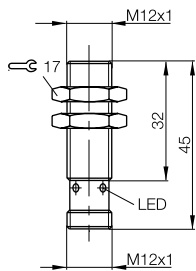


M12x1 mm	M18x1 mm	M30x1.5 mm	40x40x66 mm Unicomact	40x40x66 mm Unicomact
Flush	Flush	Flush	Flush	Not flush
4 mm	8 mm	15 mm	20 mm	35 mm
0...3.2 mm	0...6.5 mm	0...12.2 mm	0...16.2 mm	0...28.4 mm
BES02ZU	BES02ZW	BES02ZY	BES02ZZ	BES0300
BES M12ME-GNX40B-S04G-EEEX	BES M18ME1-GNX80B-S04G-EEEX	BES M30ME1-GNX15B-S04G-EEEX	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) ≤ 1 mA ≥ 2.1 mA	Current change (no trigger response) ≤ 1 mA ≥ 2.1 mA	Current change (no trigger response) ≤ 1 mA ≥ 2.1 mA	Current change (no trigger response) ≤ 1 mA ≥ 2.1 mA	Current change (no trigger response) ≤ 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

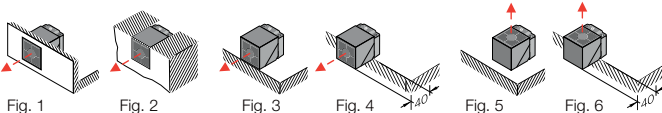
Inductive sensors
Global DC 3-wire
DC 3-/4-wire
DC 2-wire
AC/DC 2-wire
AC 2-wire
Special properties
High pressure rated sensors
Ex sensors
Steelface sensors
High temperature rated sensors
Sensors for the food industry
Factor 1 sensors
Weld and magnetic field immune sensors

EN 50014:1997+A1+A2 EN 50020	EN 50014:1997+A1+A2 EN 50020	EN 50014:1997+A1+A2 EN 50020	EN 50014:1997+A1+A2 EN 50020	EN 50014:1997+A1+A2 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 1D Ex iaD 20 T90°C	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	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
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 I = 50 mA P = 120 mW	U = 15 V I = 50 mA P = 120 mW	U = 15 V I = 50 mA P = 120 mW	U = 15 V I = 50 mA P = 120 mW	U = 15 V I = 50 mA P = 120 mW

Diagnostics sensors
Large design
Ring sensors
Hose sensors
Analog distance measurement
Accessories



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 x correction factor

Ferrous: Detection of ferromagnetic steels and irons.

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



Inductive Sensors with Special Properties

Steelface sensors

M8x1

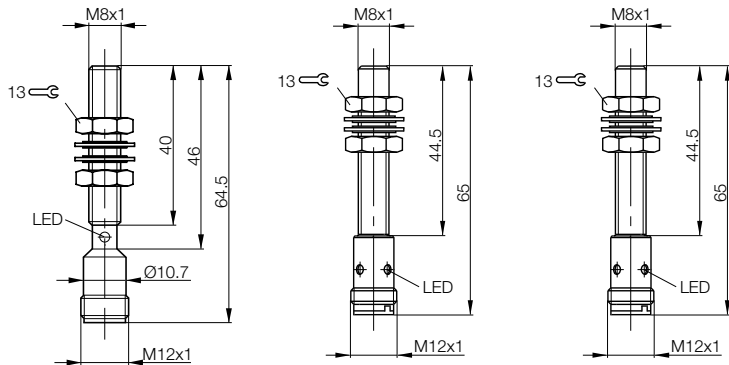


Size	M8 x 1	M8 x 1	M8 x 1
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush	Flush
Rated switching distance s_n	1.5 mm	2 mm	2 mm
Assured switching distance s_a	0...1.2 mm	0...1.6 mm	0...1.6 mm
Switching distance marking	■	■■	■■■
PNP, NO	Ordering code Part number	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_B	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 rated sensors
- Ex sensors
- Steelface sensors**
- High temperature rated sensors
- 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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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.



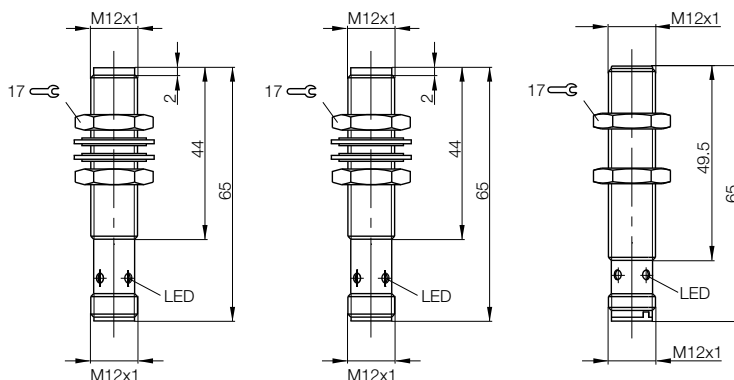


Size		M12x1	M12x1	M12x1
Installation type (pay attention to the note in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		2 mm	2 mm	4 mm
Assured switching distance s_a		0...1.6 mm	0...1.6 mm	0...3.2 mm
Switching distance marking		■	■	■■
PNP, NO	Ordering code	BES02Z2	BES02Z3	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_B		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

Connection-Switching diagram, see page 906

The meaning of switching distance markings can be found on page 911

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

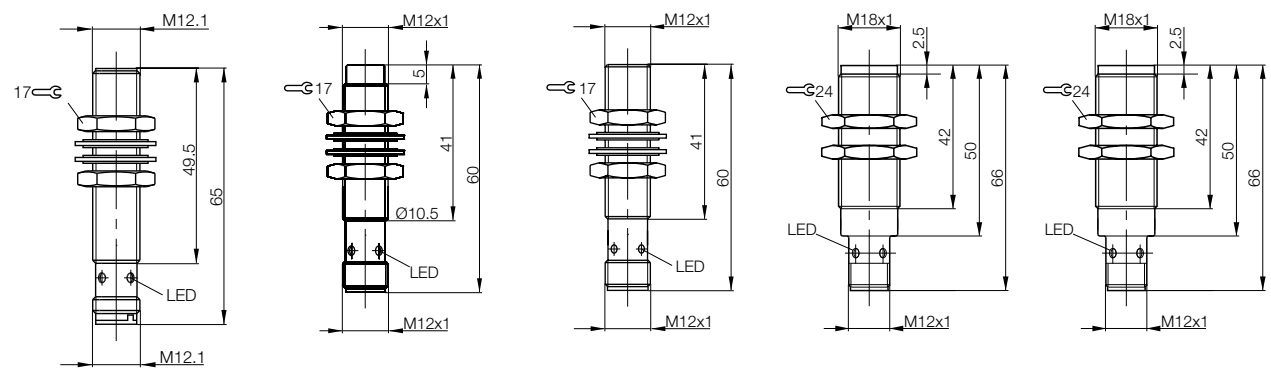


- Inductive sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special properties
- High pressure rated sensors
- Ex sensors
- Steelface sensors**
- High temperature rated sensors
- Sensors for the food industry
- Factor 1 sensors
- Weld and magnetic field immune sensors
- Diagnostics sensors
- Large designs
- Ring sensors
- Hose sensors

- Analog distance measurement
- Accessories



M12x1	M12x1	M12x1	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



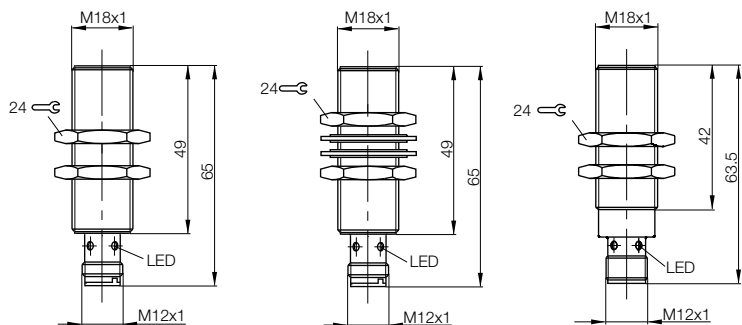


Size		M18x1	M18x1	M18x1
Installation type (pay attention to the note in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		7.2 mm	7.2 mm	10 mm
Assured switching distance s_a		0...5.2 mm	0...5.2 mm	0...8.1 mm
Switching distance marking		■ ■	■ ■	■ ■
PNP, NO	Ordering code	BES02NJ	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_B		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

Connection-Switching diagram, see page 906

The meaning of switching distance markings can be found on page 911

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

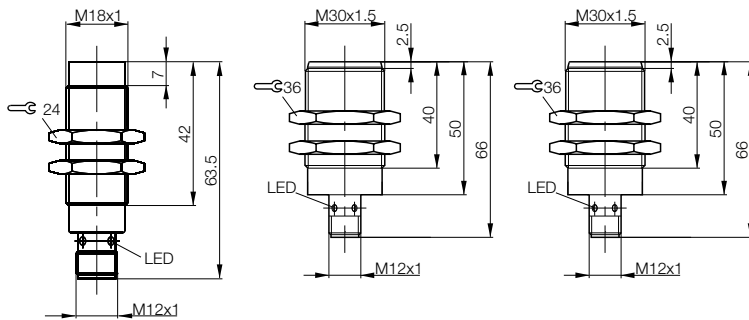
Steelface sensors

M18x1, M30x1.5



M18x1	M30x1.5	M30x1.5		
Not flush	Flush	Flush		
20 mm	8 mm	8 mm		
0...16.2 mm	0...6.5 mm	0...6.5 mm		
■ ■	■	■		
BES02Y1	BES02ZH	BES02ZJ		
BES M18EF1-PSC20F-S04G-S	BES M30EG1-PSC80N-S04G-S	BES M30EG1-PSC80S-S04G-S		
		BES02ZF		
		BES M30EG1-NSC80S-S04G-S		
10...30 V DC	10...30 V DC	10...30 V DC		
2 V	2 V	2 V		
75 V DC	75 V DC	75 V DC		
200 mA	100 mA	100 mA		
Yes/Yes/Yes	Yes/No/Yes	Yes/No/Yes		
-25...+70 °C	-25...+70 °C	-25...+70 °C		
200 Hz	15 Hz	15 Hz		
Yellow LED	Yellow LED	Yellow LED		
IP 67	IP 67	IP 67		
CE	CE	CE		
Pressure rated to 60 bar	Selective non-ferrous	Selective ferrous		
Stainless steel	Stainless steel	Stainless steel		
Stainless steel	Stainless steel	Stainless steel		
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 rated sensors
- Ex sensors
- Steelface sensors**
- High temperature rated sensors
- 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

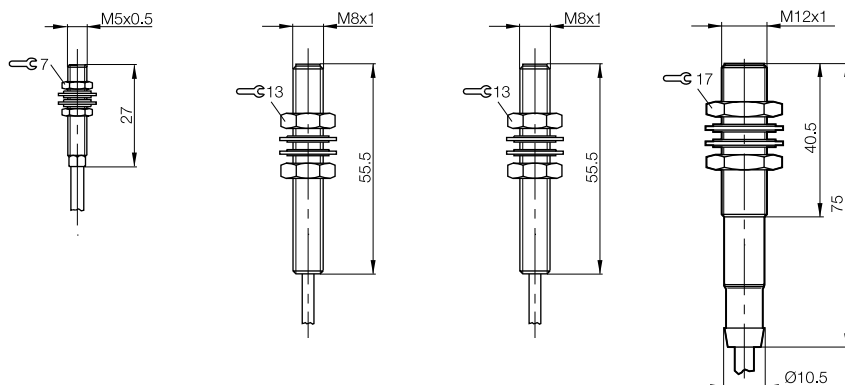




Size	M5x0.5	M8 x 1	M8 x 1	M12x1
Installation type	Flush	Flush	Flush	Flush
Rated switching distance s_n	0.5 mm	1 mm	2 mm	2 mm
Assured switching distance s_a	0...0.4 mm	0...0.8 mm	0...1.6 mm	0...1.6 mm
Switching distance marking	■	■	■ ■	■
PNP, Ordering code	BES02J2	BES02HP	BES02HK	BES02HU
NO Part number	BES M05ED-PSD05B-ES02-T01	BES 516-324-SA8-02	BES 516-324-SA26-02	BES 516-325-SA19-03
NPN, NO Ordering code				BES0361
NPN, NO Part number				BES 516-329-SA14-AO-X-03
NPN, complementary Ordering code				
NPN, complementary Part number				
Supply voltage U_B	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
Material 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

Connection-Switching diagram, see page 906
Switching distance markings can be found
on page 911

Other cable lengths on request.

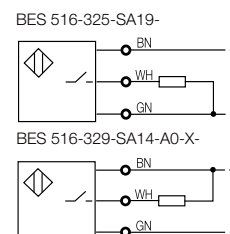


Temperature rated sensors to +120 °C

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

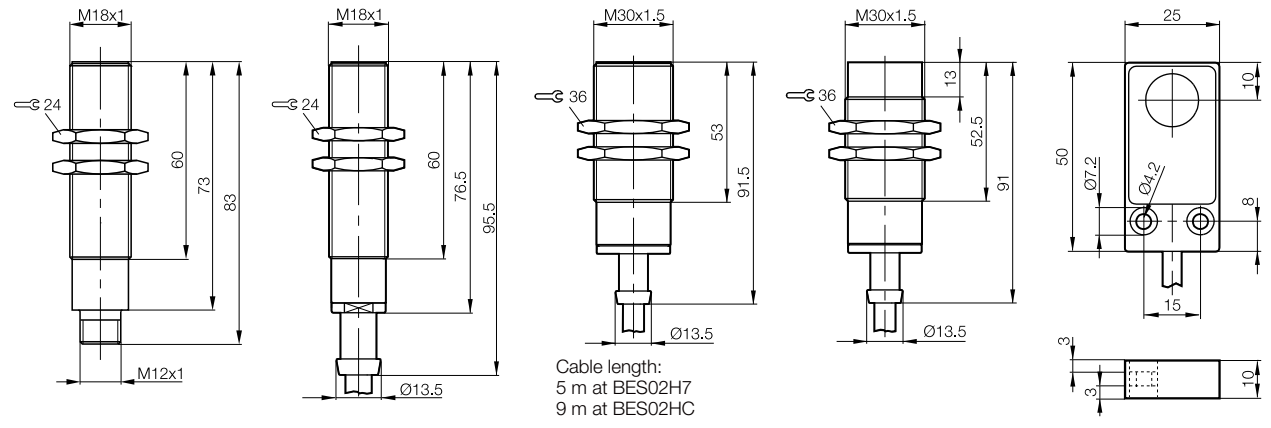
M18x1, M30x1.5, 25x50x10 mm



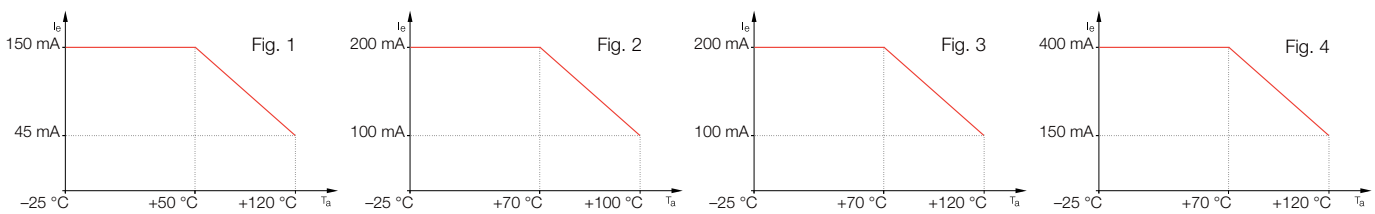
- Inductive sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special properties
- High pressure rated sensors
- Ex sensors
- Steelface sensors
- High temperature rated sensors
- Sensors for the food industry
- Factor 1 sensors
- Weld and magnetic field immune sensors
- Diagnostics sensors
- Large designs
- Ring sensors
- Hose sensors
- Analog distance measurement
- Accessories



M18x1	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
■	■	■	■	■
BES02H6	BES02H5	BES02H7	BES02HE	BES02J0
BES 516-105-SA5	BES 516-105-SA2-05	BES 516-114-SA1-05	BES 516-125-SA1-05	BES 516-347-SA2-03
		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
12 plug connector, 4-pin	5 m silicon cable, 4x0.75 mm ²	Silicon cable, 4x0.75 mm ² ,	5 m silicon cable, 4x0.75 mm ²	3 m silicon cable, 4x0.75 mm ²



Current reduction as a function of ambient temperature range



Inductive Sensors with Special Properties

Temperature resistant sensors

Temperature resistant sensors

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



Size		
Installation type		
Rated switching distance s_n		
Assured switching distance s_a		
Switching distance marking		
PNP, NO	Ordering code	
	Part number	
Supply voltage U_B		
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.		
Degree of protection as per IEC 60529		
Approvals		
Material	Housing	
	Sensing surface	
Connection		

Connection-Switching diagram, see page 906
 The meaning of switching distance markings can be found on page 911



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

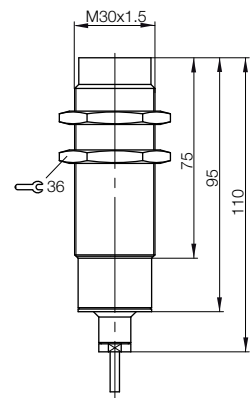
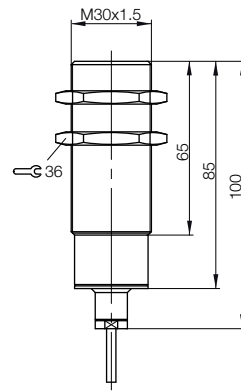
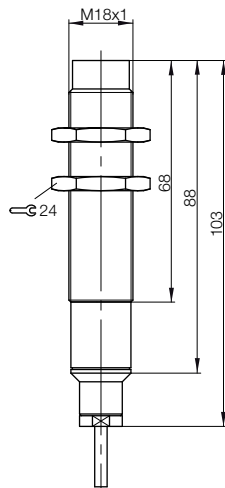
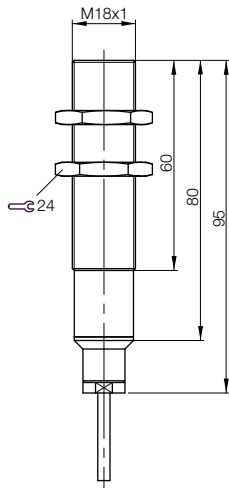


160 °C
High temperature range



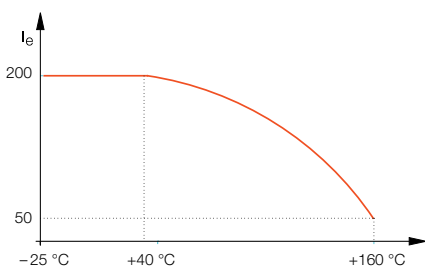
M18x1	M18x1	M30x1.5	M30x1.5
Flush	Not flush	Flush	Not flush
5 mm	8 mm	10 mm	15 mm
0...4 mm	0...6.4 mm	0...8 mm	0...12 mm
■	■	■	■
BES043T	BES043U	BES043W	BES043Y
BES 515-326-SA49-D-TF-02	BES 515-360-SA13-D-TF-02	BES 515-327-SA22-D-TF-02	BES 515-362-SA4-D-TF-02
10...30 V DC	10...30 V DC	10...30 V DC	10...30 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 cable FEP, 3x0.34 mm ²	2 m cable FEP, 3x0.34 mm ²	2 m cable FEP, 3x0.34 mm ²	2 m cable FEP, 3x0.34 mm ²

- Inductive sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special properties
- High pressure rated sensors
- Ex sensors
- Steelface sensors
- High temperature rated sensors**
- 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

Rated operating current



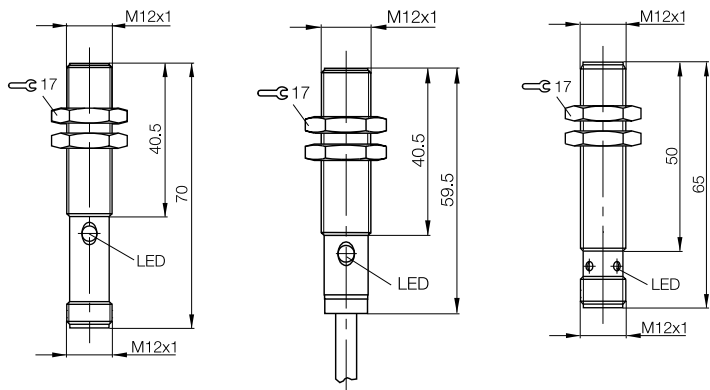


Increased temperature range

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_B	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		3 m PUR cable, 3x0.34 mm ²	M12 connector, 4-pin	M12 connector, 4-pin

Connection-Switching diagram, see page 906
 The meaning of switching distance markings can be found on page 911

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 also used more and more in aggressive environments: in machine tools, in the chemical industry, in packaging machines- 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

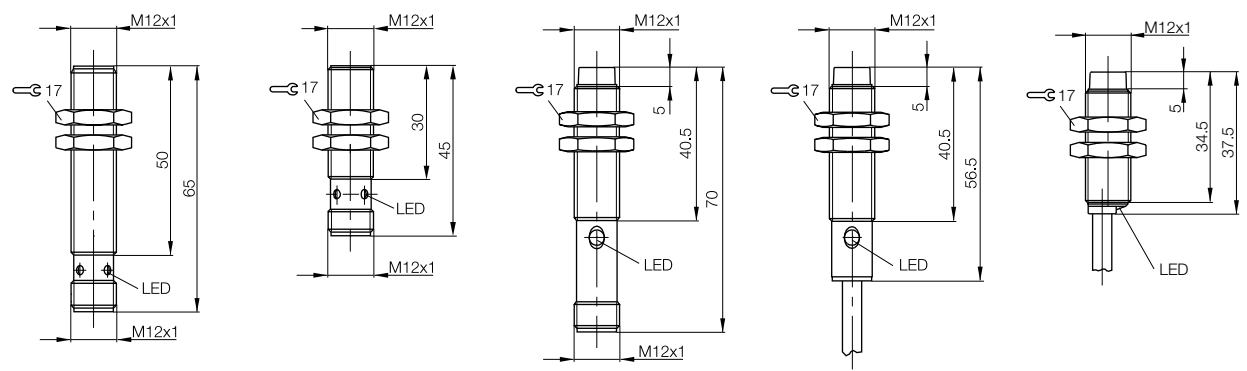
Sensors for the food industry – M12x1 standard



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	10...30 V DC
2.5 V	2 V	1.5 V	1.5 V	2 V	2 V
250 V AC (□)	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	200 mA
Yes/Yes/Yes	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	-25...+70 °C
≤ 2 kHz	≤ 2 kHz	≤ 1.5 kHz	≤ 1.5 kHz	≤ 2 kHz	≤ 2 kHz
Yellow LED	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	IP 68 per BWN Pr. 20
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
LCP	LCP	PA 12	PA 12	PBT	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	3 m PVC cable, 3x0.34 mm ²

- Inductive sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special properties
- High pressure rated sensors
- Ex sensors
- Steelface sensors
- High temperature rated sensors
- 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

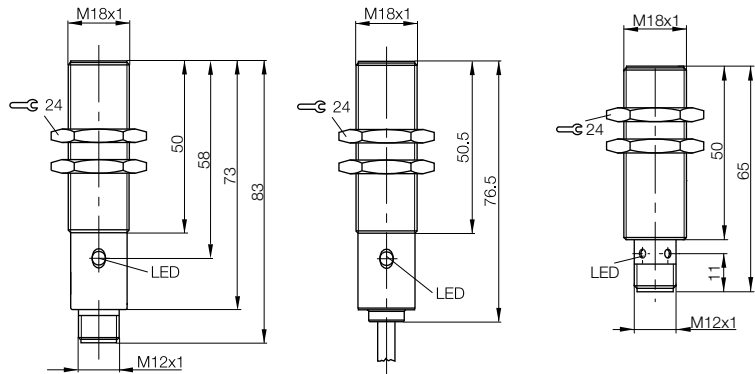




Size		M18x1	M18x1	M18x1
Installation type (pay attention to the note in the Basic Information chapter)		Flush	Flush	Flush
Rated switching distance s_n		5 mm	5 mm	8 mm
Assured switching distance s_a		0...4.1 mm	0...4.1 mm	0...6.5 mm
Switching distance marking		■	■	■■
PNP, NO	Ordering code	BES02EU	BES02EN	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_B		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, 3×0.34 mm ²	M12 connector, 4-pin

Connection-Switching diagram, see page 906
 The meaning of switching distance markings can be found on page 911

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

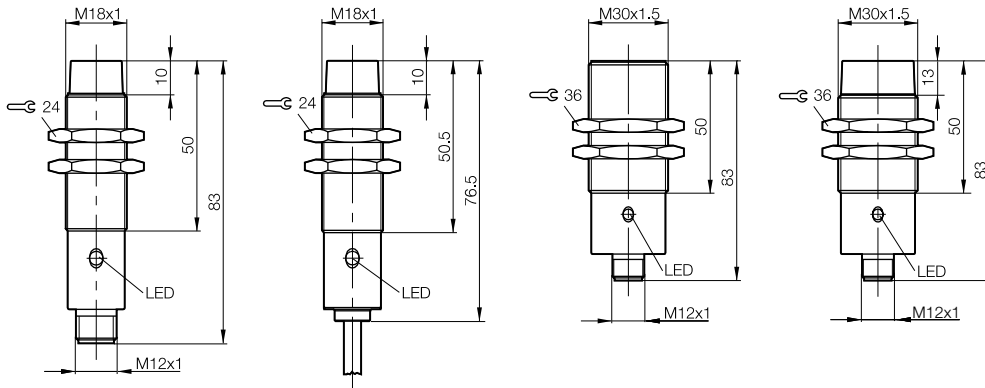


Inductive Sensors with Special Properties

Sensors for the food industry – standard M18x1, M30x1.5



M18x1	M18x1	M30x1.5	M30x1.5	
Not flush	Not flush	Flush	Not flush	Inductive sensors
8 mm	8 mm	10 mm	15 mm	Global DC 3-wire
0...6.5 mm	0...6.5 mm	0...8.1 mm	0...12.2 mm	DC 3-/4-wire
■	■	■	■	DC 2-wire
BES02FL	BES02FH	BES02F1	BES02FN	AC/DC 2-wire
BES 515-360-S4-C	BES 515-360-BO-C-PU-03	BES 515-327-S4-C	BES 515-362-S4-C	AC 2-wire
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	Special properties
1.5 V	1.5 V	2.5 V	2.5 V	High pressure rated sensors
250 V AC (□)	250 V AC (□)	250 V AC (□)	250 V AC (□)	Ex sensors
200 mA	200 mA	200 mA	200 mA	Steelface sensors
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	High temperature rated sensors
-40...+85 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	Sensors for the food industry
≤ 600 Hz	≤ 600 Hz	≤ 300 Hz	≤ 100 Hz	Factor 1 sensors
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Weld and magnetic field immune sensors
IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	Diagnostics sensors
CE, cULus	CE, cULus	CE, cULus	CE, cULus	Large designs
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Ring sensors
PA 12	PA 12	PA 12	PA 12	Hose sensors
M12 connector, 4-pin	3 m PUR cable, 3x0.34 mm ²	M12 connector, 4-pin	M12 connector, 4-pin	Analog distance measurement



Accessories

Inductive Sensors with Special Properties

Sensors for the food industry – increased requirements

PROXINOX®

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 indicator directly on the sensor: The drill hole for the LED is a potential source of danger during cleaning processes and a possible means of entry for bacteria. The function display is completely wrapped in the transparent plastic of the connector.
- Housing made of stainless steel (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-coated contacts: The difficult installation relationships require gold-coated contacts, so that plug corrosion is prevented.
- Lasered or etched part number: Cleaning- and disinfection processes dissolve type plates. Lasered or etched part numbers are there to stay.
- Additional O-ring-seals for extreme requirements: temperature shocks – triggered by cleaning and disinfection – cause strong, different residual stress on steel housings and casting resin.

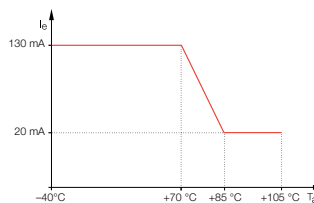


Size	
Installation type (pay attention to the note in the Basic Information chapter)	
Rated switching distance s_n	
Assured switching distance s_a	
Switching distance marking	
PNP, NO	Ordering code
	Part number
Supply voltage U_R	
Voltage drop U_d at I_o max.	
Rated insulation voltage U_i (protection 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	

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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

Current reduction as a function of ambient temperature range



Steam jet tested



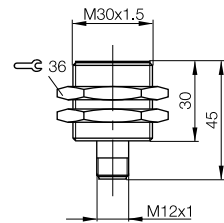
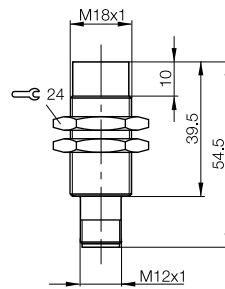
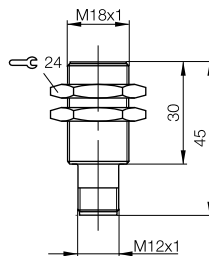
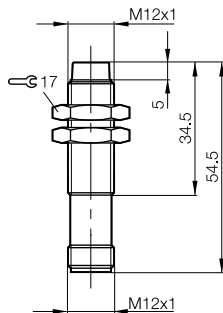
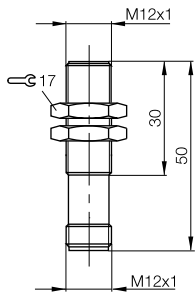
Inductive Sensors with Special Properties

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

- Inductive sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special properties
- High pressure rated sensors
- Ex sensors
- Steelface sensors
- High temperature rated sensors
- 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

Sensors for the food industry – the highest requirements

PROXINOX®

In the food industry and medical and pharmaceutical technology, special requirements are placed on sensors: 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

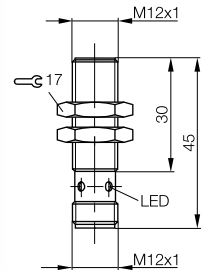
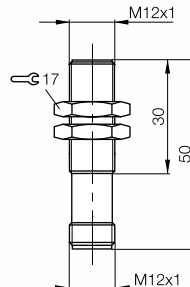
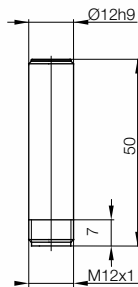
Sensors for the food industry – the highest requirements Ø 12 mm, M12x1



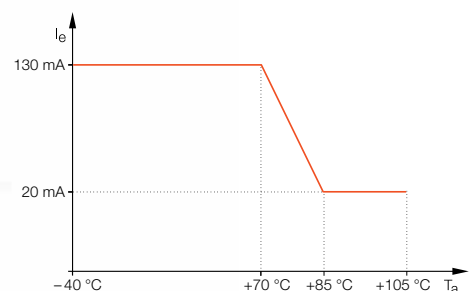
Size	Ø 12 mm	M12x1	M12x1
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush	Flush
Rated switching distance s_n	2 mm	2 mm	4 mm
Assured switching distance s_a	0...1.6 mm	0...1.6 mm	0...3.2 mm
Switching distance marking	■	■	■
PNP, NO	Ordering code Part number	BES0430 BES G12EE1-PSY20B-S04G-L02	BES0444 BES M12EE1-PSY20B-S04G-L01
PNP, NC	Ordering code Part number		BES0432 BES M12EE-POC40B-S04G-L01
Supply voltage U_B	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 68 as per BWN Pr. 20
Approvals	CE, cULus, Ecolab, FDA compliant	CE, cULus, Ecolab, FDA compliant	CE, cULus, Ecolab, FDA compliant
Material	Housing: Stainless steel 1.4571 Sensing surface: PEEK	Stainless steel 1.4571 PEEK	Stainless steel 1.4404 LCP
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 rated sensors
- Ex sensors
- Steelface sensors
- High temperature rated sensors
- 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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911
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®

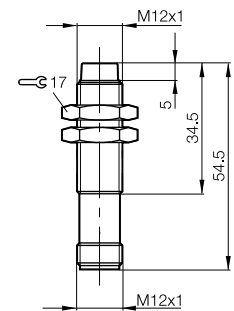
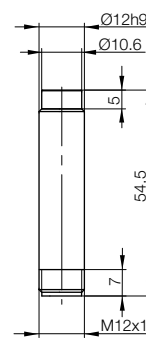
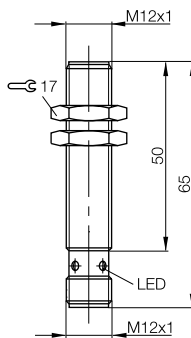
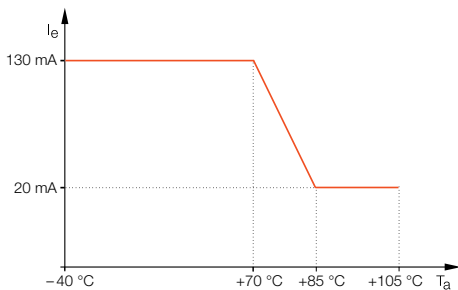


Size	M12x1	Ø 12 mm	M12x1
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Not flush	Not flush
Rated switching distance s_n	4 mm	4 mm	4 mm
Assured switching distance s_a	0...3.2 mm	0...3.2 mm	0...3.2 mm
Switching distance marking	■	■	■
PNP, NO	Ordering code Part number	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_B	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 (Ⓜ)	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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

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

***Current decrease curve**



Inductive Sensors with Special Properties

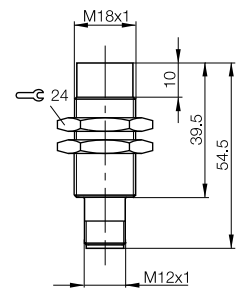
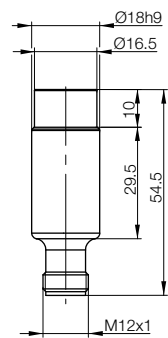
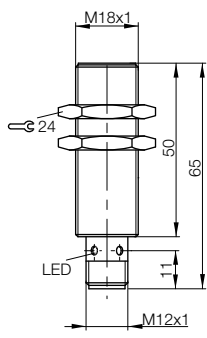
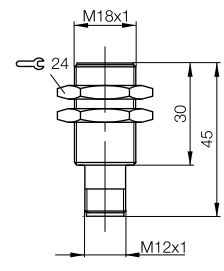
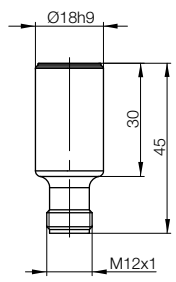
Sensors for the food industry – the highest requirements Ø 18 mm, M18x1



- Inductive sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special properties
- High pressure rated sensors
- Ex sensors
- Steelface sensors
- High temperature rated sensors
- 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



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



Inductive Sensors with Special Properties

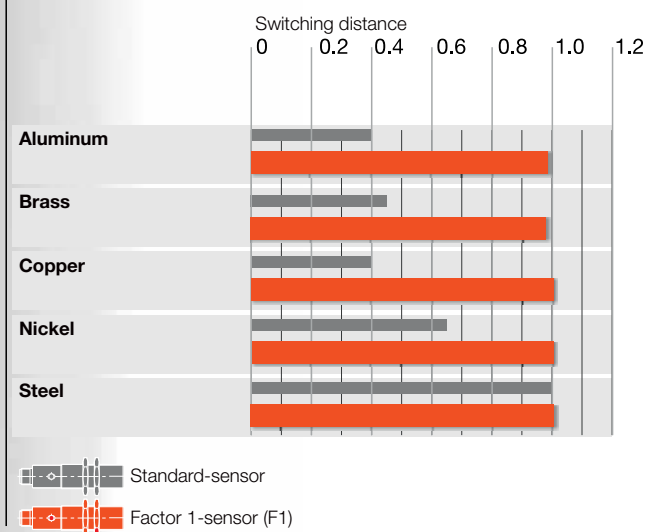
Factor 1

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





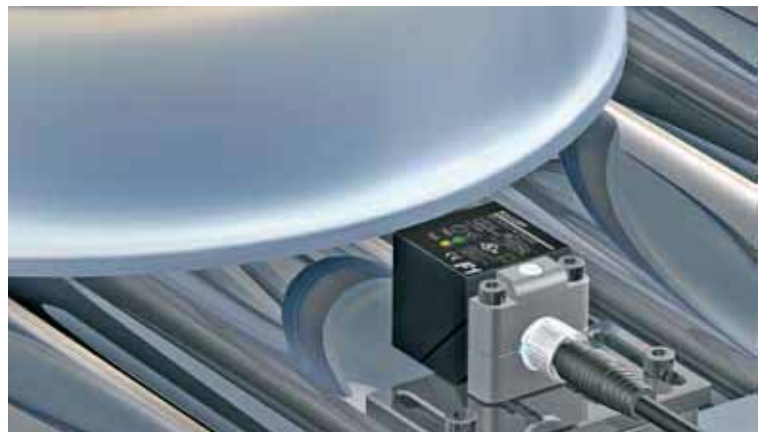
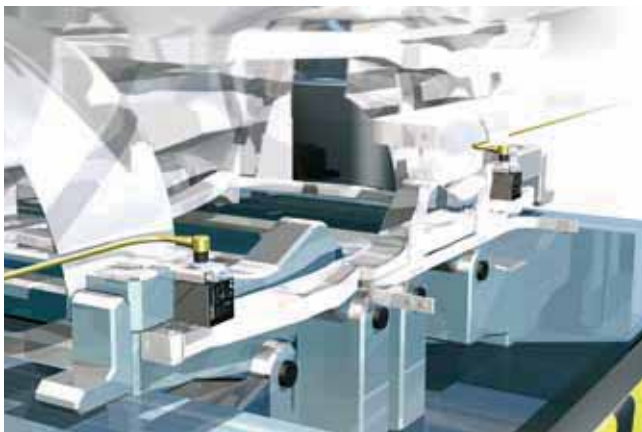
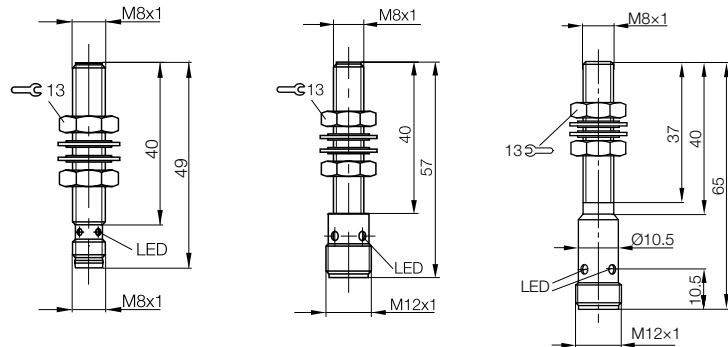
Inductive Sensors with Special Properties

Factor 1
M8 x 1



Size	M8 x 1	M8 x 1	M8 x 1		
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush	Flush	Inductive sensors	
Rated switching distance s_n	1.5 mm	1.5 mm	2 mm	Global DC 3-wire	
Assured switching distance s_a	0...1.2 mm	0...1.2 mm	0...1.6 mm	DC 3-/4-wire	
Switching distance marking	■	■	■	DC 2-wire	
PNP, NO	Ordering code	BES02YR	BES02YT	BES03YP	DC 2-wire
	Part number	BES M08EG-PSC15A-S49G-W	BES M08EG1-PSC15A-S04G-W	BES M08MG1-PSC20A-S04G-W	AC/DC 2-wire
Supply voltage U_B	10...30 V DC	10...30 V DC	10...30 V DC	AC 2-wire	
Voltage drop U_d at I_e max.	2.5 V	2.5 V	3 V	Special properties	
Rated insulation voltage U_i (protection class)	75 V DC	250 V AC (□)	75 V DC	High pressure rated sensors	
Rated operating current I_e	150 mA	150 mA	100 mA	Ex sensors	
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Steelface sensors	
Ambient temperature T_a	-25...+70 °C	-25...+70 °C	-25...+70 °C	High temperature rated sensors	
Switching frequency f max.	2 kHz	2 kHz	1 kHz	Sensors for the food industry	
Output function indicator	Yellow LED	Yellow LED	Yellow LED	Factor 1 sensors	
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67	Weld and magnetic field immune sensors	
Approvals	CE	CE	CE	Diagnostics sensors	
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	Large designs	
Material	Housing	Stainless steel, PTFE coated	Stainless steel, PTFE coated	Ring sensors	
	Sensing surface	PBT, PTFE coated	PBT, PTFE coated	Hose sensors	
Connection		M8 connector, 4-pin	M12 connector, 4-pin	Analog distance measurement	
				Accessories	

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911



Inductive Sensors with Special Properties

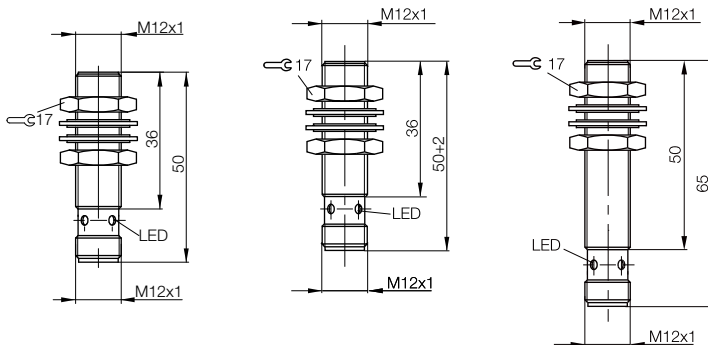
Factor 1

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_B		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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911





Inductive Sensors with Special Properties

Factor 1 M12x1

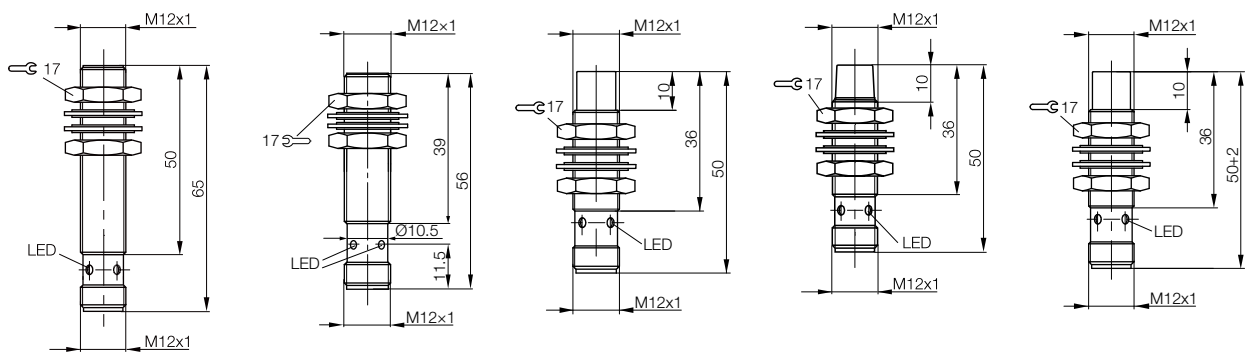


- Inductive sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special properties
- High pressure rated sensors
- Ex sensors
- Steelface sensors
- High temperature rated sensors
- Sensors for the food industry
- Factor 1 sensors**
- Weld and magnetic field immune sensors
- Diagnostics sensors
- Large designs
- Ring sensors
- Hose sensors

- Analog distance measurement
- Accessories



M12x1	M12x1	M12x1	M12x1	M12x1	M12x1
Flush	Flush	Not flush	Not flush	Not flush	Not flush
3 mm	4 mm	8 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	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	10...30 V DC
2.5 V	3 V	2.5 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 (□)	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	-25...+70 °C
2 kHz	2 kHz	2 kHz	2 kHz	2 kHz	2 kHz
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, coated	Brass, PTFE coated	Brass, coated	Brass, coated
Ceramic coating	PPS	LCP, PTFE coated	LCP, PTFE coated	PA 12	PA 12
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin



Inductive Sensors with Special Properties

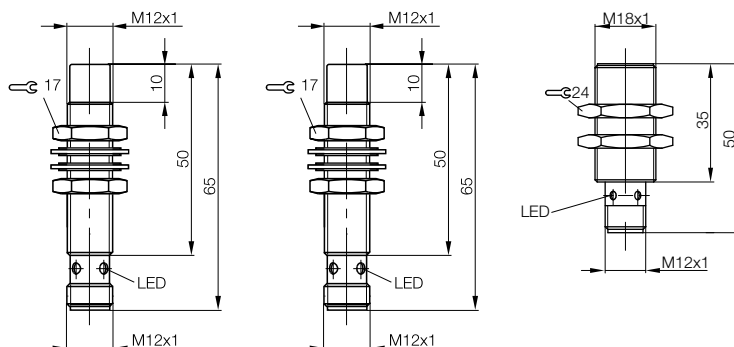
Factor 1

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	BES02K5	BES02K6	BES01R3
Ordering code			
Part number	BES M12ML-PSC80E-S04G-W	BES M12ML-PSC80E-S04G-W01	BES M18MF-PSC50A-S04G
Supply voltage U_B	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	2.5 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
	Sensing surface	LCP, PTFE coated	Ceramic coating
Connection	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911





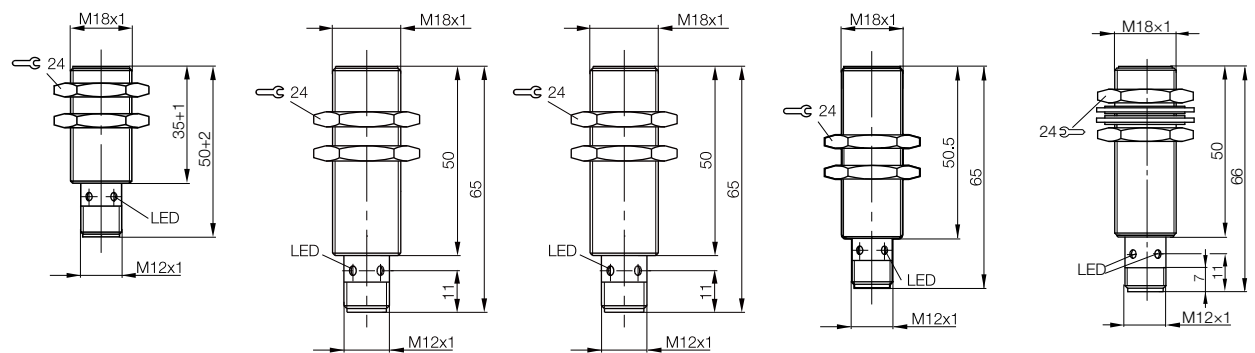
Inductive Sensors with Special Properties

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 rated sensors
- Ex sensors
- Steelface sensors
- High temperature rated sensors
- 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

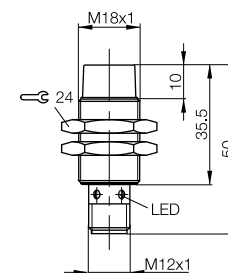
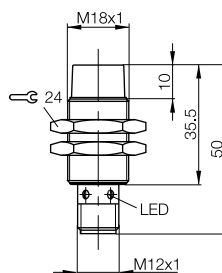
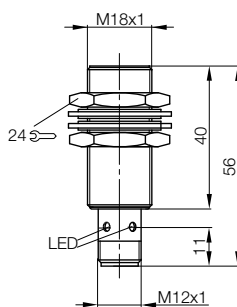
Factor 1

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_B		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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911



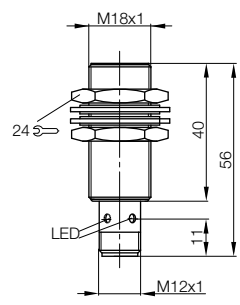
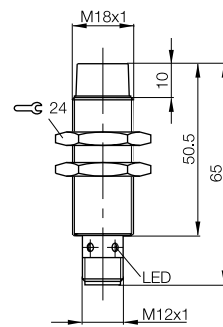
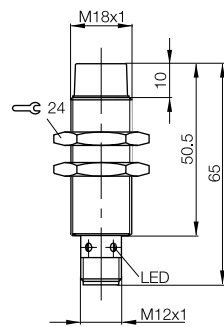
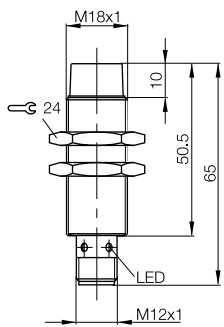


Inductive Sensors with Special Properties

Factor 1 M18x1



M18x1	M18x1	M18x1	M18x1	
Not flush	Not flush	Not flush	Quasi-flush	Inductive sensors
12 mm	12 mm	12 mm	12 mm	Global DC 3-wire
0...9.7 mm	0...9.5 mm	0...10.8 mm	0...9.7 mm	DC 3-/4-wire
■ ■	■ ■	■ ■	■ ■ ■	DC 2-wire
BES02KF	BES02KH		BES03YW	AC/DC 2-wire
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	AC 2-wire
2.5 V	2.5 V	2 V	3 V	
250 V AC (□)	250 V AC (□)	250 V AC (□)	60 V DC (□)	Special properties
200 mA	200 mA	200 mA	200 mA	High pressure rated sensors
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Ex sensors
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	Steelface sensors
2.5 kHz	2.5 kHz	300 Hz	600 Hz	High temperature rated sensors
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Sensors for the food industry
IP 67	IP 67	IP 67	IP 67	Factor 1 sensors
CE	CE	CE	CE	Weld and magnetic field immune sensors
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	Diagnostics sensors
Brass, PTFE coated	Brass, PTFE coated	Stainless steel	Brass, PTFE coated	Large designs
LCP, PTFE coated	Ceramic coating	LCP	PPS	Ring sensors
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	Hose sensors



Analog distance measurement
Accessories

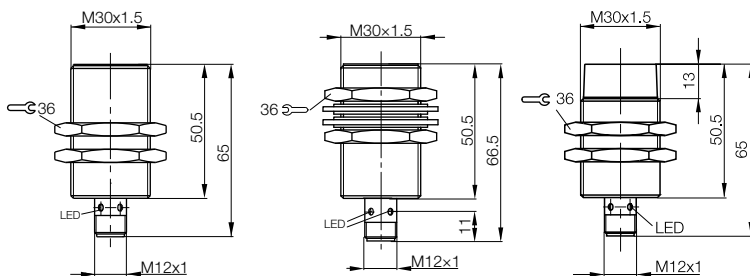
Inductive Sensors with Special Properties

Factor 1 M30x1.5



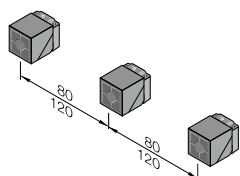
Size		M30x1.5	M30x1.5	M30x1.5
Installation type (pay attention to the note in the Basic Information chapter)		Flush	Flush	Not flush
Rated switching distance s_n		10 mm	15 mm	20 mm
Assured switching distance s_a		0...8.1 mm	0...12.1 mm	0...16 mm
Switching distance marking		■	■■	■
PNP, NO	Ordering code	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_B		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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911

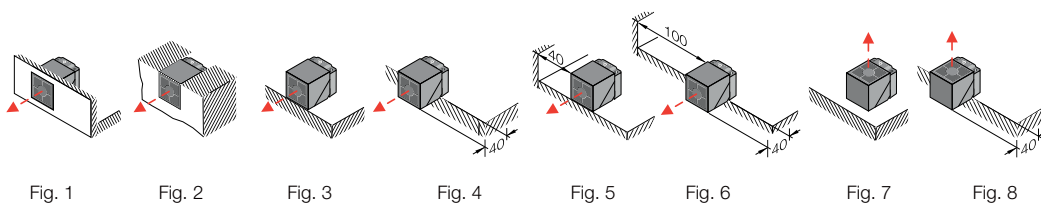


Row mounting

Flush 80 mm
Ø 120 mm non-flush



Permissible installation options





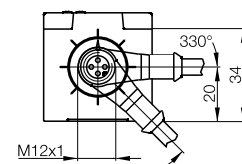
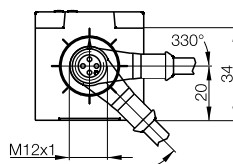
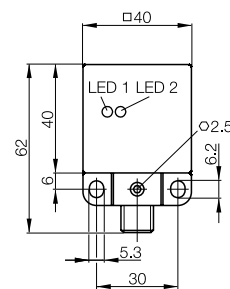
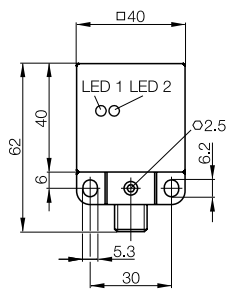
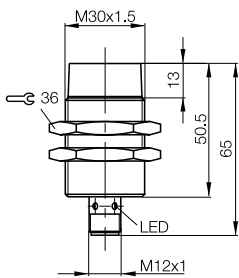
Inductive Sensors with Special Properties

Factor 1 M30x1.5, 40x40 mm Unicomact



M30x1.5	40x40 mm	40x40 mm	
Not flush	Flush	Flush	Inductive sensors
20 mm	15 mm	15 mm	Global DC 3-wire
0...16 mm	0...11.9 mm	0...11.9 mm	DC 3-/4-wire
■	■	■	DC 2-wire
BES03MZ	BES021P	BES021T	AC/DC 2-wire
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	AC 2-wire
2.5 V	2.5 V	2.5 V	AC 2-wire
250 V AC (□)	250 V AC (□)	250 V AC (□)	Special properties
200 mA	200 mA	200 mA	High pressure rated sensors
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Ex sensors
-25...+70 °C	-25...+70 °C	-25...+70 °C	Steelface sensors
1 kHz	400 Hz	400 Hz	High temperature rated sensors
Yellow LED/No	Green LED/Yellow LED	Green LED/Yellow LED	Sensors for the food industry
IP 67	IP 67	IP 67	Factor 1 sensors
CE	CE	CE	Weld and magnetic field immune sensors
Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Interference-proof against magnetic AC and DC fields	Diagnostics sensors
Brass, PTFE coated	PBT	PBT, ceramic coating	Large designs
Ceramic coating	PBT	PBT, ceramic coating	Ring sensors
	Image 1...8	Image 1...8	Hose sensors
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 rated sensors
- Ex sensors
- Steelface sensors
- High temperature rated sensors
- 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

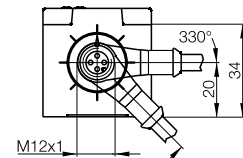
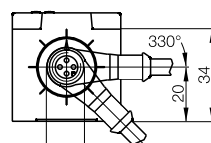
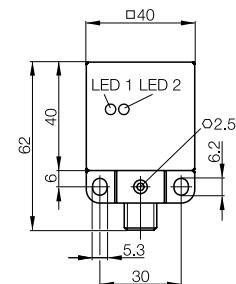
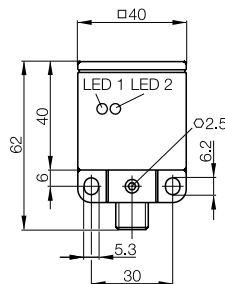
Factor 1

40×40 mm Unicomact



Size		40×40 mm	40×40 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_B		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

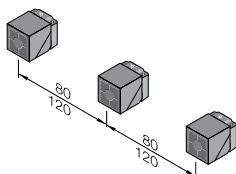
Connection-Switching diagram, see page 906
Switching distance markings can be found on page 911



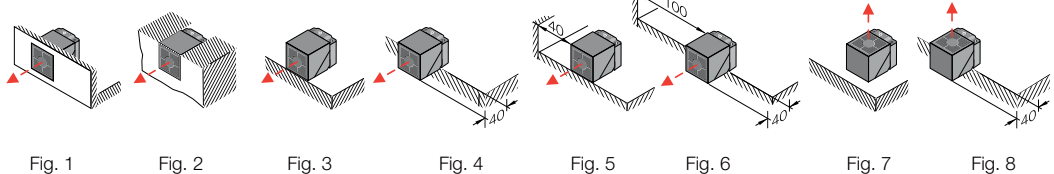
Row mounting

Flush 80 mm

Ø 120 mm non-flush



Permissible installation options





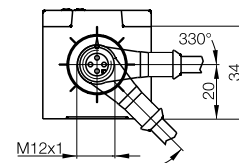
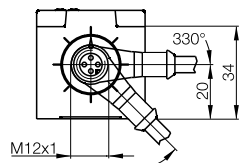
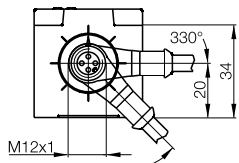
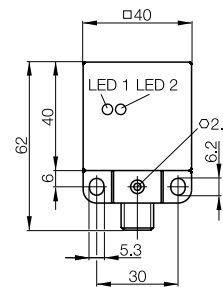
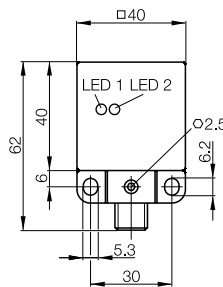
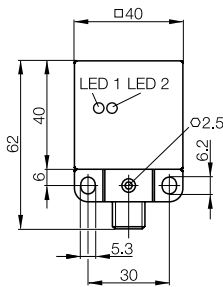
Inductive Sensors with Special Properties

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 rated sensors
- Ex sensors
- Steelface sensors
- High temperature rated sensors
- 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

Magnetic field immune sensors

Magnetic field immune, weld-immune

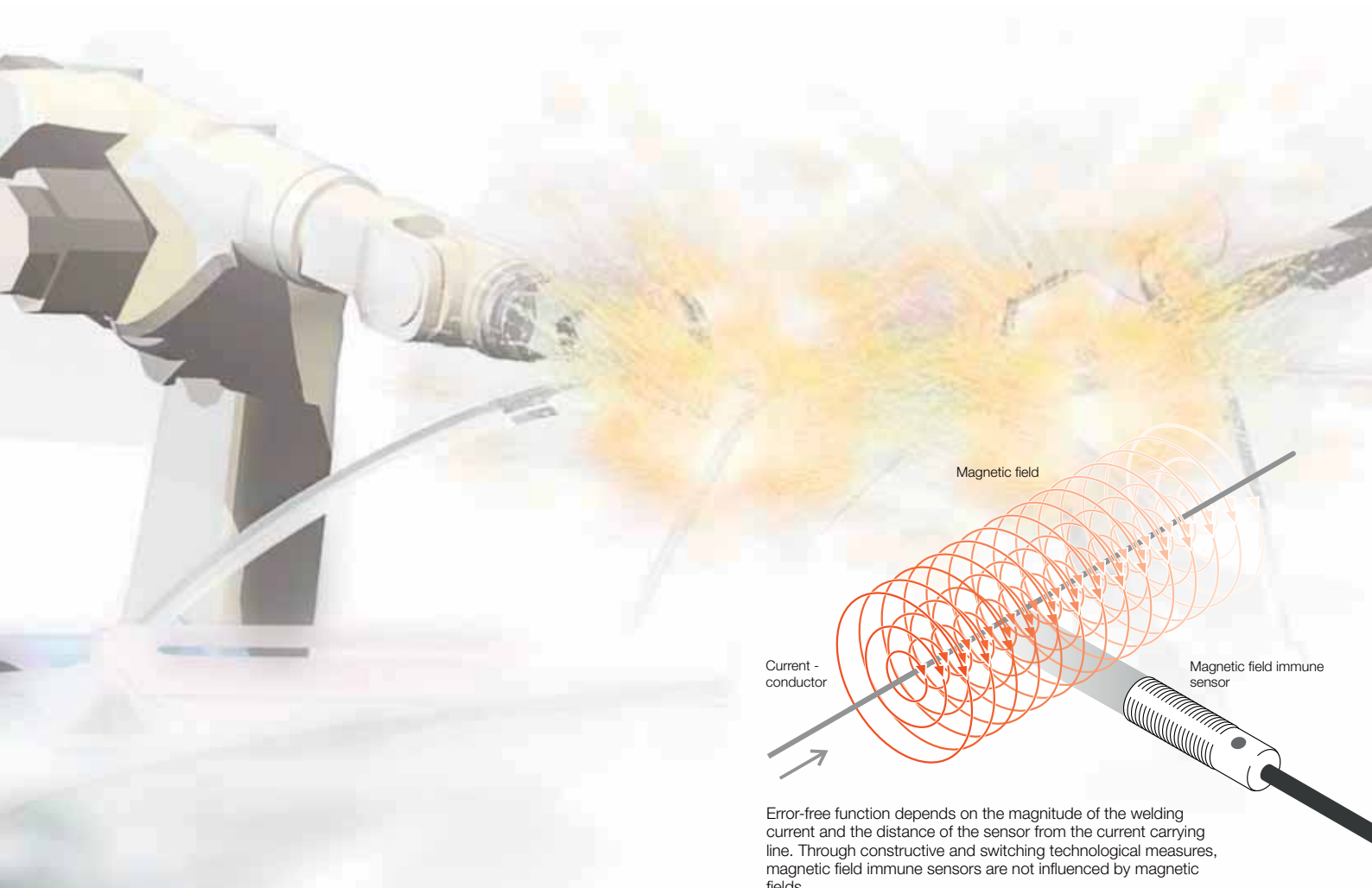
Weld-immune sensors – the all-rounder for rough industrial applications

Magnetic field immune: Insensitive to magnetic fields which are created from electrical weld currents up to 25 kA (at a distance to the current conductor of approx. 5 cm).

Weld spatter-resistant: Resistant to metal injectors, slag and combustion residue which is created during welding processes.

Factor 1: Identical switching distance with metals such as steel, stainless steel, aluminum or brass.

Note on 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 of the sensor from 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

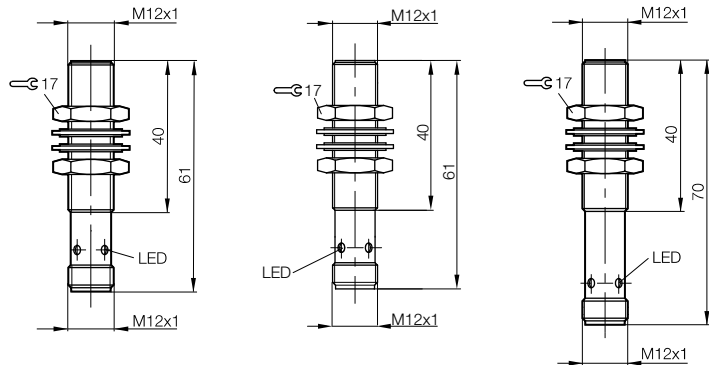
Magnetic field immune sensors

M12x1



Size	M12x1	M12x1	M12x1	
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush	Flush	Inductive sensors
Rated switching distance s_n	2 mm	2 mm	2 mm	Global DC 3-wire
Assured switching distance s_a	1.6 mm	1.6 mm	1.6 mm	DC 3-/4-wire
Switching distance marking	■	■	■	DC 2-wire
PNP, NO	Ordering code	BES02J6	BES02J5	DC 3-/4-wire
	Part number	BES 516-325-S4-W	BES 516-325-S4-CW	DC 2-wire
Supply voltage U_B	10...30 V DC	10...30 V DC	10...30 V DC	AC/DC 2-wire
Voltage drop U_d at I_e max.	2.5 V	2.5 V	2.5 V	AC 2-wire
Rated insulation voltage U_i (protection class)	250 V AC (II)	250 V AC (II)	75 V DC	Special properties
Rated operating current I_e	200 mA	200 mA	200 mA	High pressure rated sensors
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Ex sensors
Ambient temperature T_a	-25...+70 °C	-25...+70 °C	-25...+70 °C	Steelface sensors
Switching frequency f max.	1 kHz	1 kHz	1 kHz	High temperature rated sensors
Output function indicator	Yellow LED	Yellow LED	Yellow LED	Sensors for the food industry
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67	Factor 1 sensors
Approvals	CE	CE	CE	Weld and magnetic field immune sensors
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	Diagnostics sensors
Material	Housing	Brass, PTFE coated	Stainless steel, PTFE coated	Large designs
	Sensing surface	LCP, PTFE coated	PTFE	Ring sensors
Connection		M12 connector, 4-pin	M12 connector, 4-pin	Hose sensors
			M12 connector, 4-pin	Analog distance measurement
				Accessories

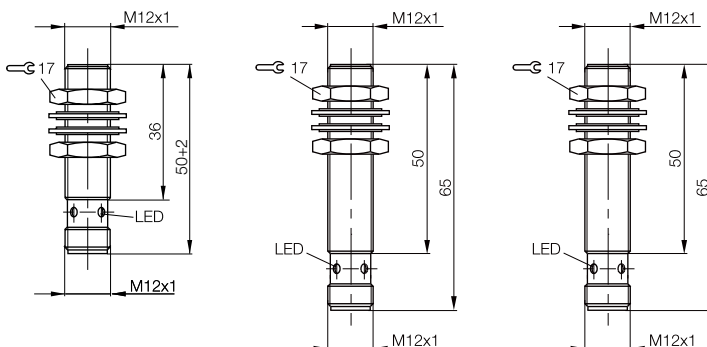
Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911





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 M12MI-PSC30A-S04G-W01	BES M12MI-PSC30B-S04G-W01
Supply voltage U_B	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	-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

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911



Inductive Sensors with Special Properties

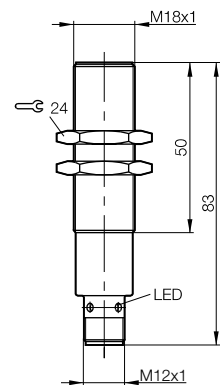
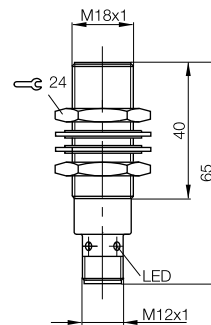
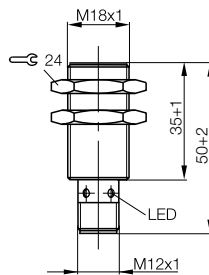
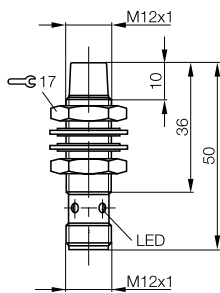
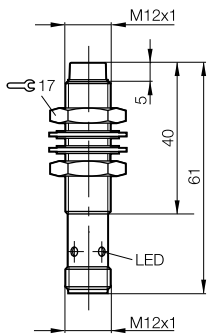
Magnetic field immune sensors

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

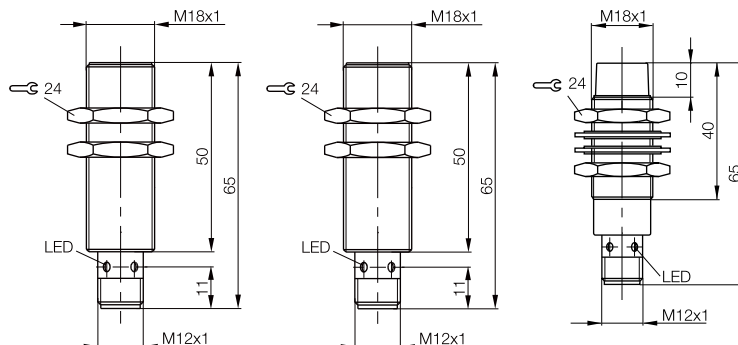
- Inductive sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special properties
- High pressure rated sensors
- Ex sensors
- Steelface sensors
- High temperature rated sensors
- Sensors for the food industry
- Factor 1 sensors
- Weld and magnetic field immune sensors**
- Diagnostics sensors
- Large designs
- Ring sensors
- Hose sensors
- Analog distance measurement
- Accessories





Size	M18x1	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
	Part number	BES M18MI-PSC70B-S04G-W	BES M18MI-PSC70B-S04G-W01
Supply voltage U_B	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 (□)	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
	Sensing surface	LCP, PTFE coated	Ceramic coating
Connection	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin

Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911



Inductive Sensors with Special Properties

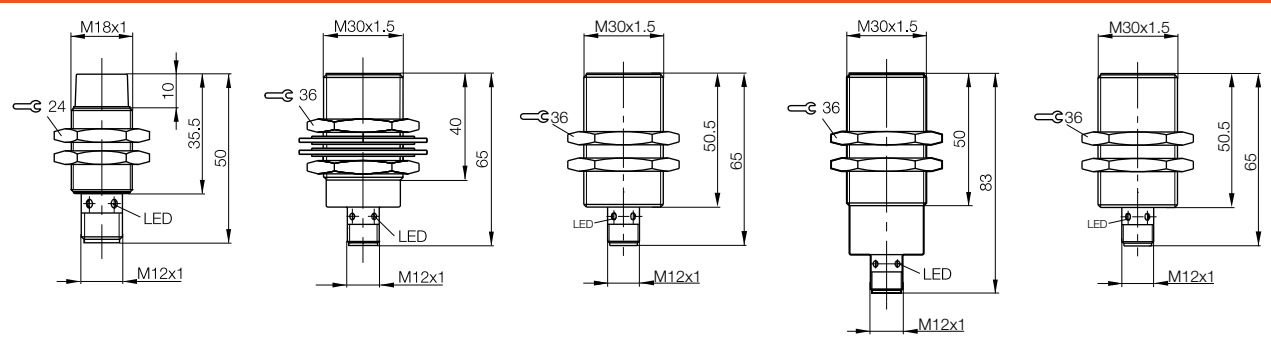
Magnetic field immune sensors

M18x1, M30x1.5



M18x1	M30x1.5	M30x1.5	M30x1.5	M30x1.5
Not flush	Flush	Flush	Flush	Flush
12 mm	10 mm	10 mm	10 mm	13 mm
9.5 mm	8.1 mm	7.9 mm	8.1 mm	10.5 mm
■ ■	■	■	■	■
BES02K8	BES02JJ	BES02KN	BES02JK	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
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
250 V AC (□)	250 V AC (□)	250 V AC (□)	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	-5...+60 °C
2.5 Hz	100 Hz	600 Hz	50 Hz	30 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	Brass, PTFE coated	Brass, PTFE coated
Ceramic coating	PTFE	Ceramic coating	Ceramic	LCP, PTFE coated
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 rated sensors
- Ex sensors
- Steelface sensors
- High temperature rated sensors
- 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

Magnetic field immune sensors

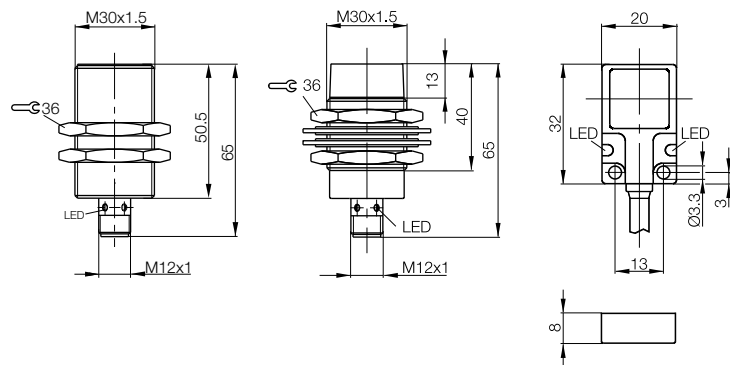
M30×1.5, 32×20×8 mm R01

Magnetic field immune, weld-immune



Size	M30×1.5	M30×1.5	32×20×8 mm R01
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Not flush	Flush
Rated switching distance s_n	13 mm	15 mm	5 mm
Assured switching distance s_a	10.3 mm	12.2 mm	4 mm
Switching distance marking	■	■	■
PNP, NO	Ordering code	BES02JU	BES02KW
	Part number	BES 516-362-S4-W	BES R01ZC-PSC50B-BX05-W01
Supply voltage U_B	10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d at I_e max.	2.5 V	1.5 V	2.5 V
Rated insulation voltage U_i (protection class)	250 V AC (□)	250 V AC (□)	75 V DC
Rated operating current I_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	-25...+70 °C	-25...+70 °C
Switching frequency f max.	30 Hz	100 Hz	100 Hz
Output function/power-on indicator	Yellow LED/No	Yellow LED/No	Green 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	Cast zinc
	Sensing surface	Ceramic coating	Ceramic coating
Connection	M12 connector, 4-pin	M12 connector, 4-pin	5 m PUR cable cross-linked, 3×0.25 mm ²

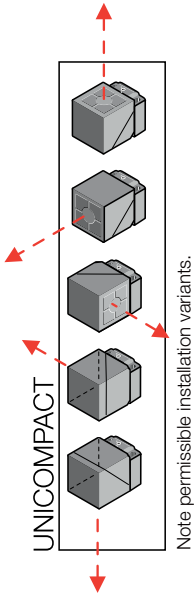
Connection-Switching diagram, see page 906
The meaning of switching distance markings can be found on page 911



Inductive Sensors with Special Properties

Magnetic field immune sensors

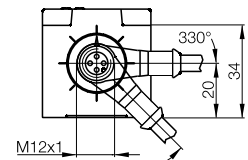
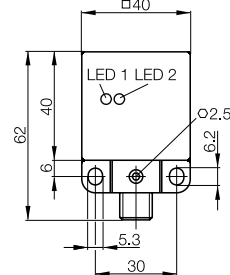
40x40 mm Unicomact



Size	40x40x62 mm	
Installation type (pay attention to the note in the Basic Information chapter)	Not flush	
Rated switching distance s_n	40 mm	
Assured switching distance s_a	32.4 mm	
Switching distance marking	■ ■	
PNP, complementary	Ordering code	BES02JR
	Part number	BES Q40KFU-PAC40E-S04G
Supply voltage U_B	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 (□)	
Rated operating current I_o	200 mA	
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	
Ambient temperature T_a	-10...+70 °C	
Switching frequency f max.	100 Hz	
Output function/power-on indicator	Green LED/Yellow LED	
Degree of protection as per IEC 60529	IP 67	
Approvals	CE	
Special properties	Interference-proof against magnetic AC and DC fields	
Material	Housing	PBT
	Sensing surface	PBT
Possible installation variations	Image 3...8	
Connection	M12 connector, 4-pin	

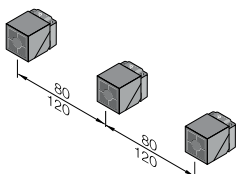
- Inductive sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special properties
- High pressure rated sensors
- Ex sensors
- Steelface sensors
- High temperature rated sensors
- Sensors for the food industry
- Factor 1 sensors
- Weld and magnetic field immune sensors**
- Diagnostics sensors
- Large designs
- Ring sensors
- Hose sensors
- Analog distance measurement
- Accessories

Connection-Switching diagram, see page 906
 The meaning of switching distance markings can be found on page 911

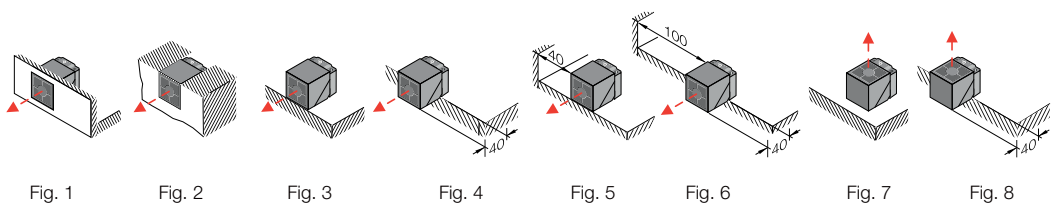


Row mounting

Flush 80 mm
 Ø 120 mm non-flush



Permissible installation options



Inductive Sensors with Special Properties

DESINA diagnostic sensors



DESINA sensors with diagnostic output

These inductive sensors are specially designed according to the DESINA specification 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 DESINA specification fulfill the requirements of the ISO 23570 part 1 standard: "Industrial automation systems and integration – Distributed installation in industrial applications – Part 1: Sensors and actuators".

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. 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 affected in their switching behavior by weld currents up to 25 kA.

Note on part numbering

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

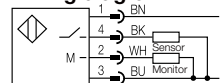
BES ...-**WM01**: Diagnostic function and Teflon coating (weld splatter resistant)



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_B	
Voltage drop U_d at I_o max.	
Rated insulation voltage U_i (protection class)	
Rated operating current I_o	
Monitor output load capacity	
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	

The meaning of switching distance markings can be found on page 911

Wiring diagram



Inductive Sensors with Special Properties

DESINA diagnostic sensors M12x1, M18x1, 40x40 Unicompact



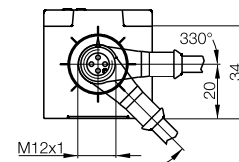
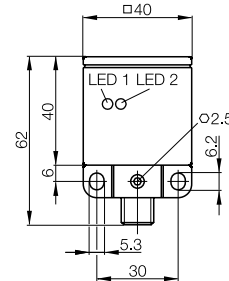
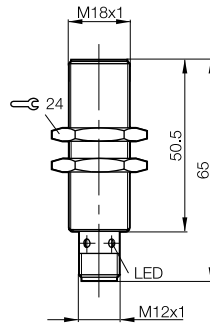
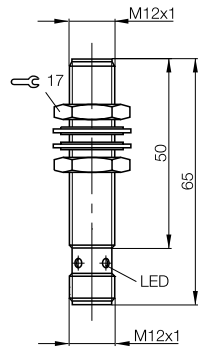
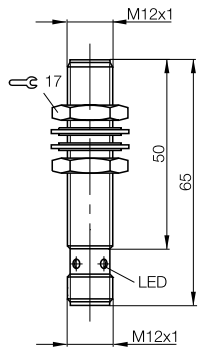
Weld immune
Magnetic field immune
Factor 1

Magnetic field immune
Factor 1



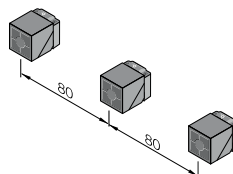
M12x1	M12x1	M18x1	40x40x62 mm Unicompact
Flush	Flush	Flush	Flush
2 mm	4 mm	5 mm	15 mm
0...1.6 mm	0...3.2 mm	0...4.1 mm	0...12.2 mm
■	■ ■	■	■
BES01ZL	BES01ZM	BES0200	BES021R
BES M12MI-PSC20B-S04G-M01	BES M12MI-PSC40B-S04G-M01	BES M18MI-PSC50A-S04G-WM01	BES Q40KFU-PSC15A-S04G-M01
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
≤ 2.5 V	≤ 2.5 V	≤ 3.5 V	≤ 3.5 V
250 V AC (□)	250 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
2 kHz	1 kHz	15 Hz	13 Hz
Yellow LED/No	Yellow LED/No	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	Brass-coated	Brass-coated	PBT
LCP	LCP	PTFE coated	PBT
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 rated sensors
Ex sensors
Steelface sensors
High temperature rated sensors
Sensors for the food industry
Factor 1 sensors
Weld and magnetic field immune sensors

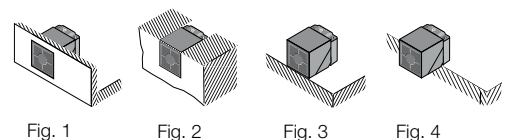


Diagnostics sensors
Large designs
Ring sensors
Hose sensors
Analog distance measurement
Accessories

Row mounting Flush 80 mm



Mounting options



Inductive Sensors with Special Properties

DESINA diagnostic sensors High pressure rated, M12x1



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. Here, the active surface is subjected to high pressure inside the cylinder. Balluff has developed a special manufacturing technique for making the sensing surface extremely resistant. This is because the coils are encased in a duromer material. 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. 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

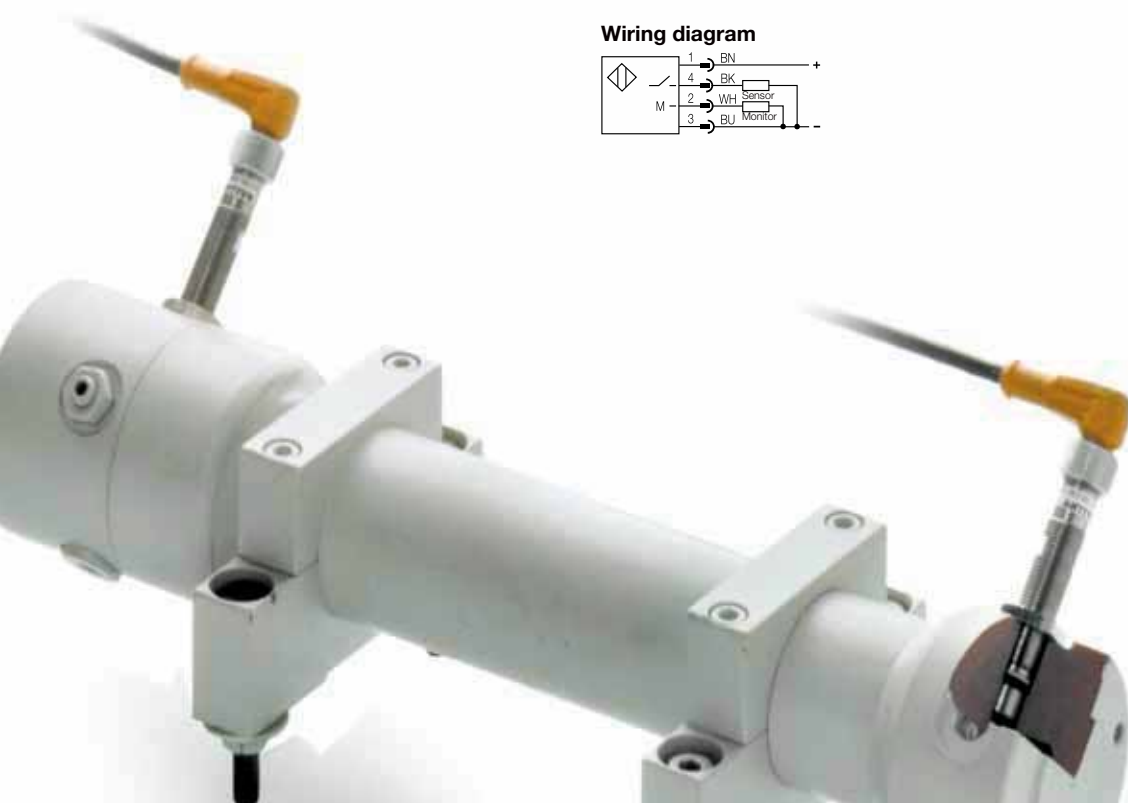
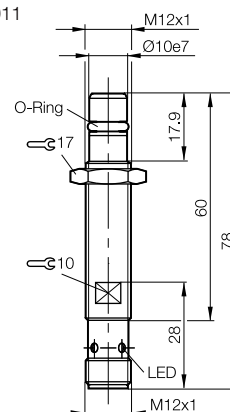
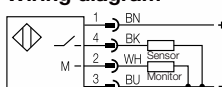
For reliable function monitoring, plug connectors without function indicators have to be used.



Size	M12x1	
Installation type (pay attention to the note in the Basic Information chapter)	Flush	
Rated switching distance s_n	1.5 mm	
Assured switching distance s_a	0...1.2 mm	
Switching distance marking	■	
PNP, NO	Ordering code	BHS006C
	Part number	BES M12EL-PSC15B-S04G-HM01
Supply voltage U_B	10...30 V DC	
Voltage drop U_d at I_o max.	3.7 V	
Rated insulation voltage U_i	75 V AC	
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.	300 Hz	
Output function indicator	Yellow LED	
Degree of protection as per IEC 60529	IP 68 per BWN Pr. 20	
Approvals	CE, cULus	
Material	Housing	Stainless steel
	Sensing surface	EP
O-ring/spare part number	5.3x2.4/631753	
Support ring/spare part number	10x5.9x1/705918	
Connection	M12 connector, 4-pin	
High pressure rated to	500 bar	

The meaning of switching distance markings can be found on page 911

Wiring diagram



Inductive Sensors with Special Properties

Desina diagnostic sensors

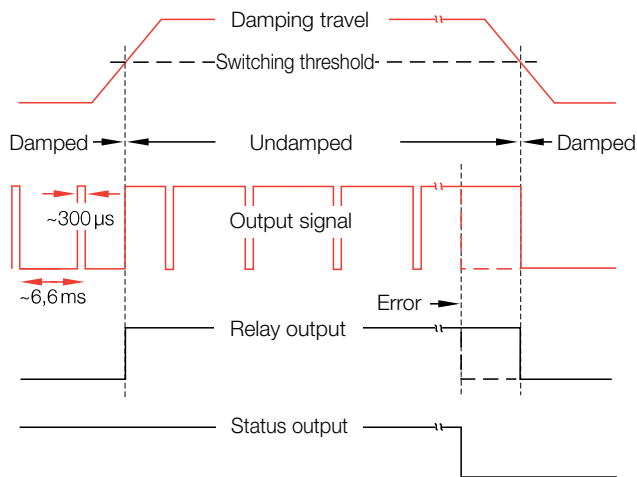
Function

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 $t \sim 300 \mu\text{s}$. 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.



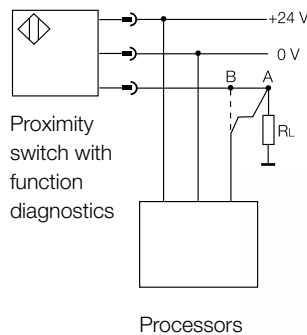
Pulse diagram of a proximity switch with function diagnostics (normally closed).

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)



Inductive sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

AC 2-wire

Special properties

High pressure rated sensors

Ex sensors

Steelface sensors

High temperature rated sensors

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

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 with Special Properties

Diagnostic sensors with Dynamic Sensor Control

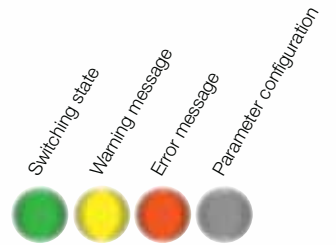
Dynamic Sensor Control increases the value of your machine concepts through

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

Knowledge



- Continuous signal
- Diagnostics
- Parameter configuration



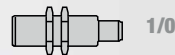
Information



- Switching signal
- Diagnostics
- Warning messages



- Switching signal
- Diagnostics



- Switching signal



Data

Increase in diagnostic accuracy and functionality

Inductive Sensors with Special Properties

Diagnostic sensors with Dynamic Sensor Control M12x1

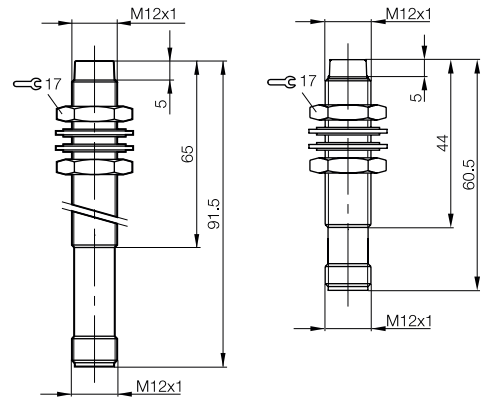


Size	M12x1	M12x1
Installation type (pay attention to the note in the Basic Information chapter)	Not flush	Not flush
Rated switching distance s_n	3.7 mm	4 mm
Assured switching distance s_a	0...3 mm	0...3 mm
Switching distance marking	■	■
PNP, NO	Ordering code Part number	BES02MC BES 113-356-SA6-S4
PNP, NC	Ordering code Part number	BES02M5 BES 113-3019-SA1-S4
Supply voltage U_B	20...30 V DC	20...30 V DC
Voltage drop U_d at I_e max.	Typ. 2.5 V	Typ. 3.5 V
Rated insulation voltage U_i (protection class)	75 V AC	75 V AC
Rated operating current I_e	130 mA	130 mA
Minimum operating current I_m	1 mA	5 mA
Output resistance R_a	Open collector	Open collector
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes
Actual switching distance s	3.7 mm +20 %/-10 %	4 mm +20 %/-10 %
Ambient temperature T_a	-25...+70 °C	0...+70 °C
Switching frequency f max.	300 Hz	300 Hz
Degree of protection as per IEC 60529	IP 67	IP 67
Approvals	CE	CE
Material	Housing: Brass-coated Sensing surface: PA 12	Brass-coated LCP
Connection	M12 connector, 4-pin, (cable length \leq 50 m to the controller)	M12 connector, 4-pin, (cable length \leq 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 rated sensors
- Ex sensors
- Steelface sensors
- High temperature rated sensors
- 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

Note

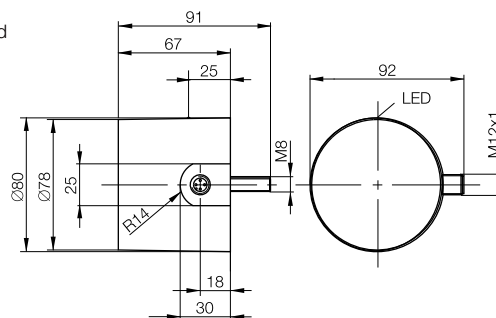
For function diagnostics switches with connector option, do not use connectors with integrated LED- function indicator, since the LED is parallel to the load R_L and cable break monitoring is then no longer assured. The switch function can however be monitored on the LEDs in the evaluation unit.





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_B	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	

Connection-Switching diagram, see page 906
 The meaning of switching distance markings can be found on page 911

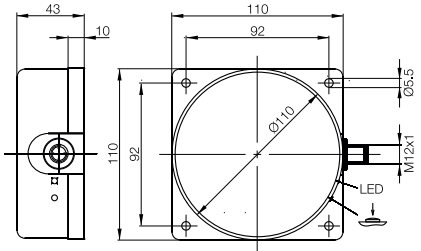
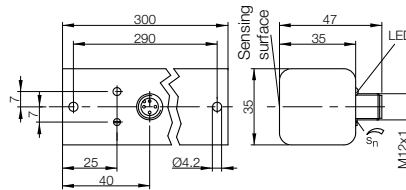
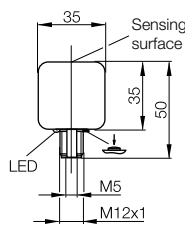
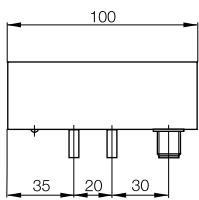


Inductive Sensors with Special Properties

Large designs



35x35x100 mm	35x35x300 mm	110x110x43 mm	
Not flush	Not flush	Not flush	Inductive sensors
30 mm (adjustable with teach-in key)	30 mm (adjustable)	70 mm (adjustable with teach-in key)	Global DC 3-wire
0...24.3 mm	0...24.3 mm	0...56.7 mm	DC 3-/4-wire
■	■	■	DC 2-wire
BES02TF	BES02TN	BES02RU	AC/DC 2-wire
BES IKU-011T.28-G-S4	BES IKU-031.28-S4	BES IKN-070T.38-G-S4	AC 2-wire
10...30 V DC	10...30 V DC	10...55 V DC	Special properties
2 V	2 V	2 V	High pressure rated sensors
75 V DC	75 V DC	75 V DC	Ex sensors
400 mA	200 mA	200 mA	Steelface sensors
Open collector	Open collector	Open collector	High temperature rated sensors
Yes/Yes/Yes	Yes/Yes/No	Yes/Yes/Yes	Sensors for the food industry
-25...+70 °C	-25...+70 °C	0...+70 °C	Factor 1 sensors
50 Hz	50 Hz	50 Hz	Weld and magnetic field immune sensors
Red LED/No	Red LED/No	Red LED/Green LED (1 LED with color change)	Diagnostics sensors
IP 65	IP 65	IP 67	Large designs
CE	CE	CE	Ring sensors
PVC	PVC	PBT	Hose sensors
PVC	PVC	PBT	Analog distance measurement
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin	Accessories





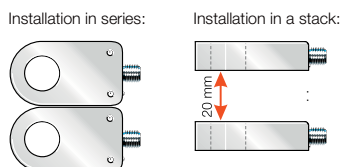
Size	
Installation type (pay attention to the note in the Basic Information chapter)	
Inside diameter d_w	
Minimum object size steel taper (St 37)	
Target velocity max.	
PNP, NO	Ordering code
	Part number
Supply voltage U_B	
Voltage drop U_d at I_o max.	
Rated insulation voltage U_i	
Rated operating 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

Connection-Switching diagram, see page 906



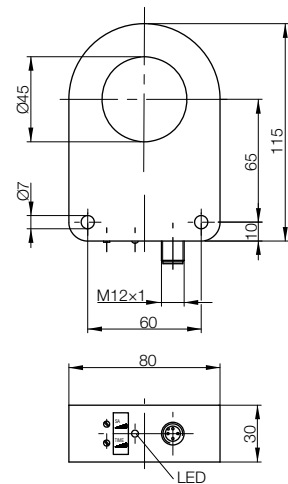
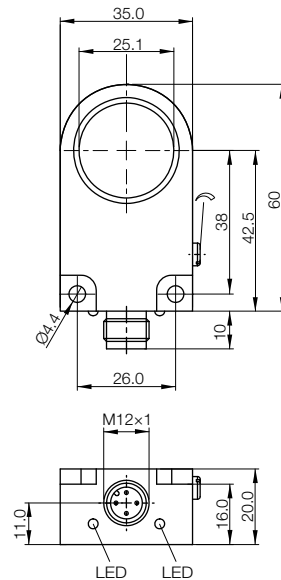
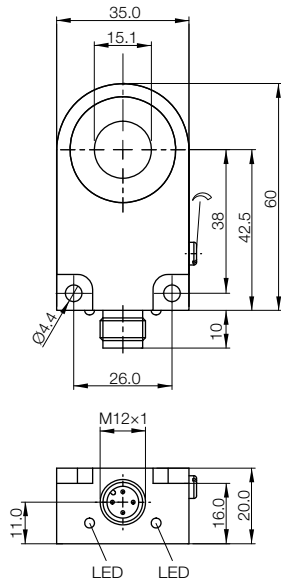
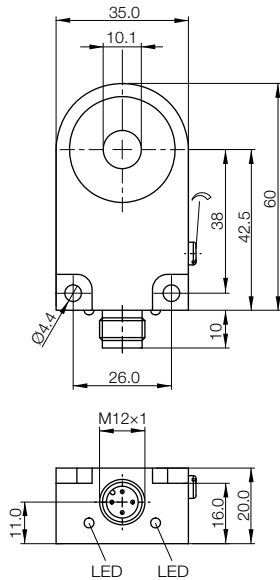
Inductive Sensors with Special Properties

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	BES02TJ
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 rated sensors
- Ex sensors
- Steelface sensors
- High temperature rated sensors
- 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 with Special Properties

Hose sensors, 17x78.5x11.9 mm

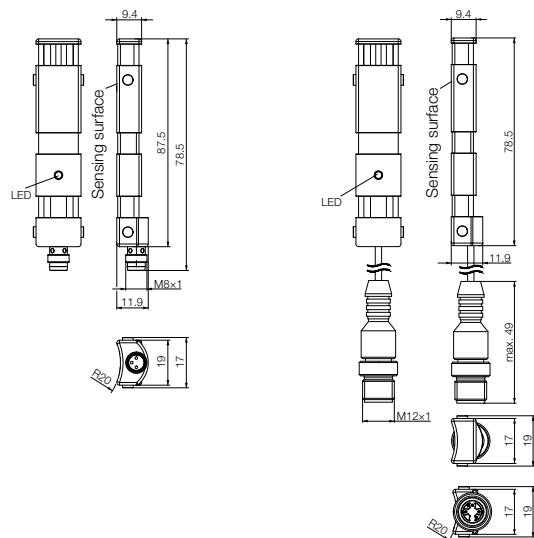
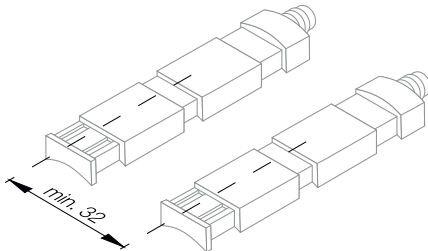


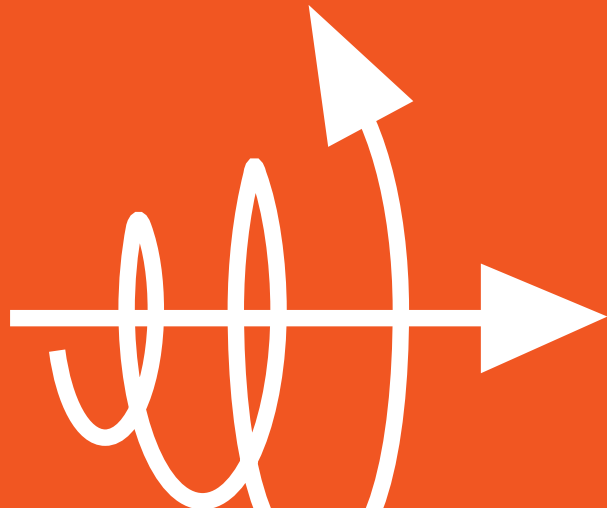
Size	17x78.5x11.9 mm	17x78.5x11.9 mm	
Installation type (pay attention to the note in the Basic Information chapter)	Not flush	Not flush	Inductive sensors
Minimum object size	Screw M3x5	Screw M3x5	Global DC 3-wire
Rated switching distance s_n	16 mm	16 mm	DC 3-/4-wire
Assured switching distance s_a	12.8 mm	12.8 mm	DC 2-wire
Switching distance marking	■	■	AC/DC 2-wire
PNP, NO	Ordering code	BES0428	DC 2-wire
	Part number	BES Z06K-PSC16F-S49G	AC/DC 2-wire
Supply voltage U_B	10...30 V DC	10...30 V DC	AC 2-wire
Voltage drop U_d at I_e max.	2.5 V	2.5 V	Special properties
Rated insulation voltage U_i	75 V DC	75 V DC	High pressure rated sensors
Rated operating current I_e	200 mA	200 mA	Ex sensors
Output resistance R_a	Open collector	Open collector	Steelface sensors
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	High temperature rated sensors
Ambient temperature T_a	-25...+70 °C	-25...+70 °C	Sensors for the food industry
Switching frequency f_{max}	10 Hz	10 Hz	Factor 1 sensors
Output function indicator	Yellow LED	Yellow LED	Weld and magnetic field immune sensors
Degree of protection as per IEC 60529	IP 67	IP 67	Diagnostics sensors
Approvals	CE	CE	Large designs
Material	Housing: PA 6.6	PA 6.6	Ring sensors
	Sensing surface: UN 3082	UN 3082	Hose sensors
Connection	M8 connector, 3-pin	0.1 m PUR cable with M12 connector, 3-pin	Analog distance measurement
Pulse stretching	150 ms	150 ms	Accessories

Connection-Switching diagram, see page 906
 The meaning of switching distance markings can be found on page 911

Rated switching distance s_n relative to steel plate FE360 (18x18x1 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.



Inductive Sensors for Analog Distance Measurement

Contents

Tubular-style housings

Ø 6.5	662
M8×1	662
M12×1	663
M18×1	667
M30×1.5	670
M12x1 high-pressure resistant	672

Block designs

10×30×6 mm (R03)	673
20×30×8 mm (R06)	674
14×38.5×17 (Z05)	675
80×80×40 mm	676
80×45×20 mm	677



Basic information
and definitions
can be found
on **page 884**.



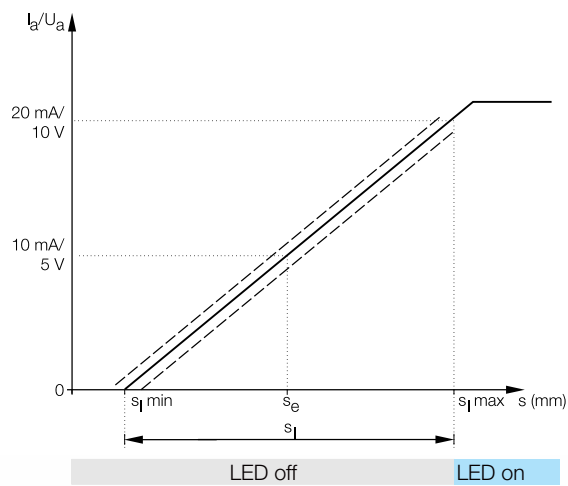
Inductive Sensors for Analog Distance Measurement

Features, output curve, evaluating programmed switching points

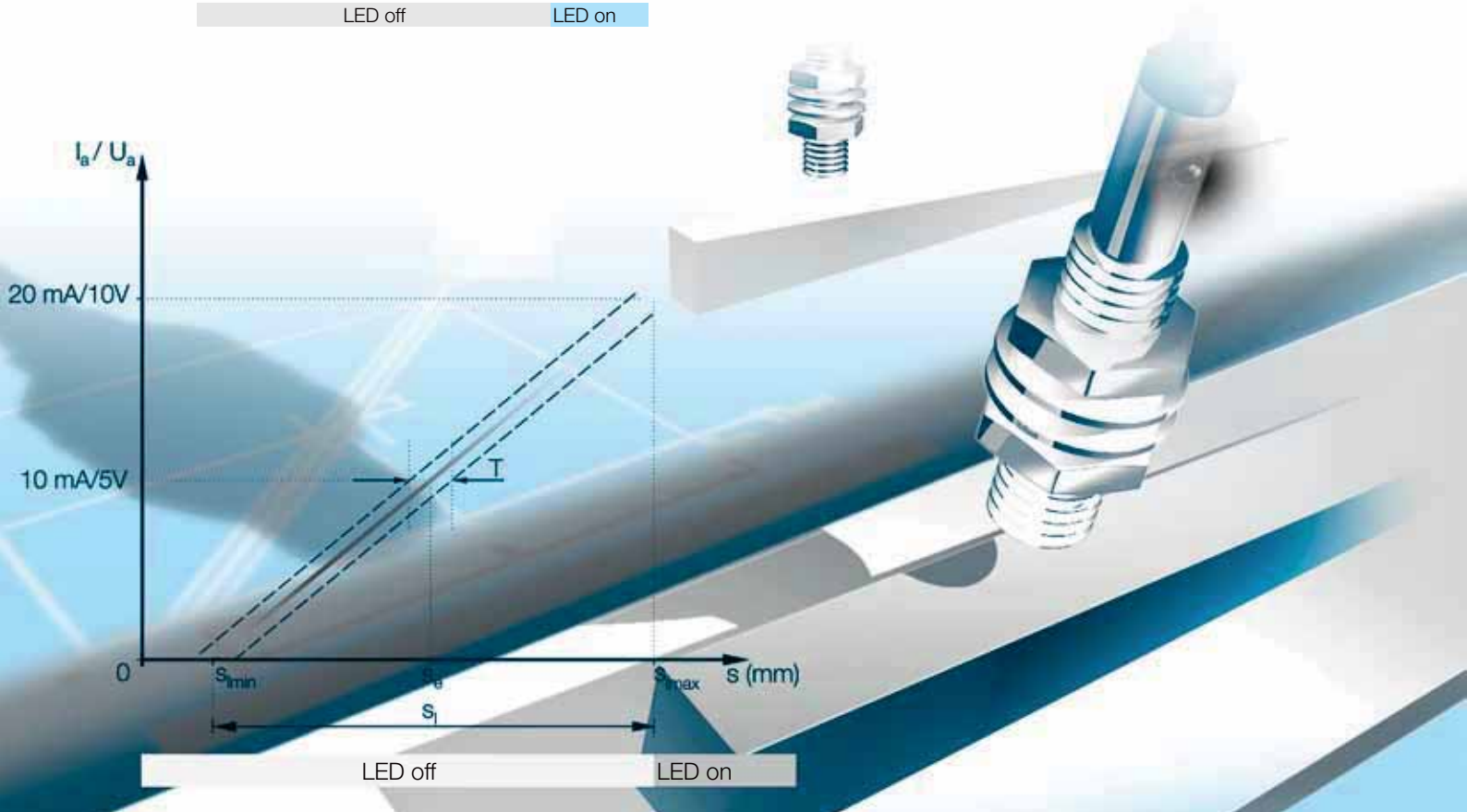
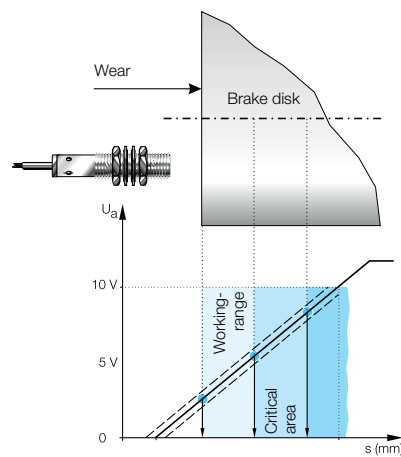
Features

- Distance-proportional analog output signal
- Contactless, absolute measuring principle
- Wide variety of designs: 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)



Inductive Sensors for Analog Distance Measurement

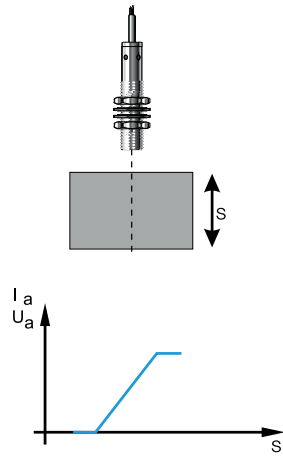
Sensors in Use

Applications

Examples of the various industrial applications include:

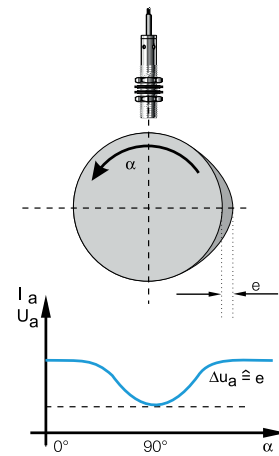
- Distance sensing (even at high travel speeds)
- Measurement of film and sheet thicknesses
- Belt center measurement
- Measurement of metal strip widths
- Detection of surface waves
- Counting tasks
- Positioning
- Position checking
- Clamping distance monitoring
- Selection of different sizes and materials

Axial approach



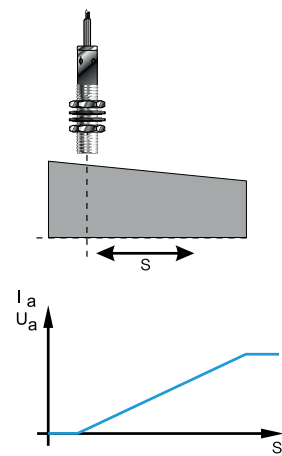
Distance changes in the sensor axis result in output signals proportional to distance.

Sensing a rotating object



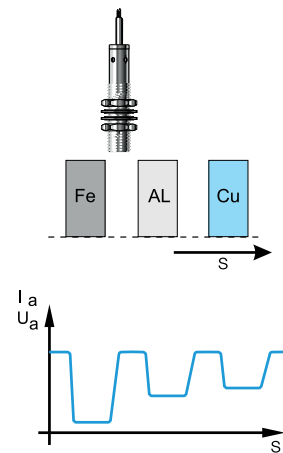
Eccentrics, cams or unbalanced motion result in a periodic change in the output signal.

Lateral approach



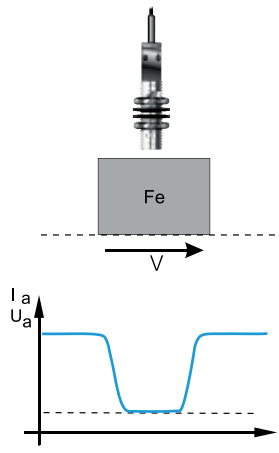
Detecting longer distances by sensing an inclined plane.

Sensing various materials



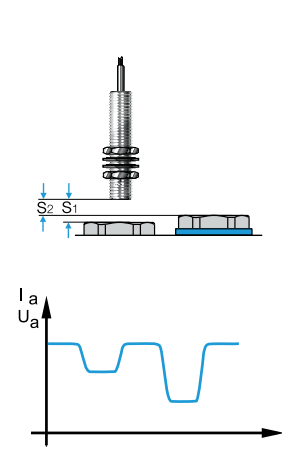
When the distance is kept constant, the output signal changes only when the object material is different.

Distance measurements at high object travel speeds



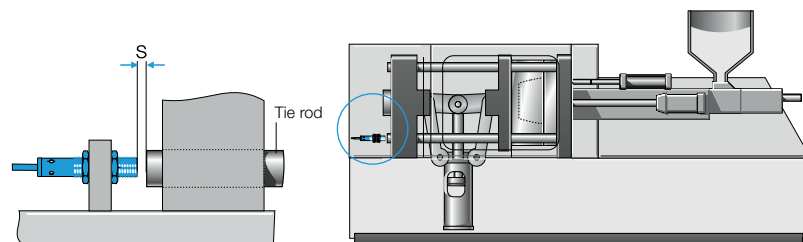
Even at high traverse speeds distances can be precisely measured.

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



Distance sensors are assigned the linear position sensing and measurement that we have marked in blue.



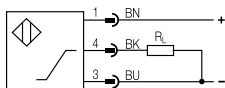
Temperature output

Series	Ø 6.5 mm	Ø 6.5 mm	M8 x 1
Installation type (pay attention to the note 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 name	BAW G06EF-UAC20B-S49G	BAW G06EE-UAF20B-EP03-K	BAW M08EI-UAD15B-BP00,2-GS04
Supply voltage U_B	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 (□)
Effective distance s_e	1.25 mm	1.25 mm	1 mm
Load resistance $R_{L \text{ min.}}$	2 kΩ	5 kΩ	2 kΩ
Load resistance $R_{L \text{ max.}}$			
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}	±40.0 μm	±10.0 μm	±8.0 μm
Non-linearity max.	±45 μm	±45 μm	±30 μm
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 μm/K	-1 μm/K	-1 μm/K
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67
Approvals	CE, cULus	CE	CE, cULus
Material	Housing: Stainless steel Sensing surface: PBT	Stainless steel PBT	Stainless steel PBT
Connection	M8 connector, 3-pin	3 m PUR cable, 4x0.14 mm ²	0.2 m PUR cable with M12 connector, 3-pin

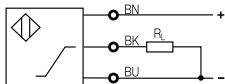
* The function is assured over a range of -10...+70 °C

Wiring diagrams

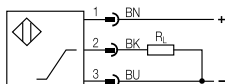
Connector, voltage output



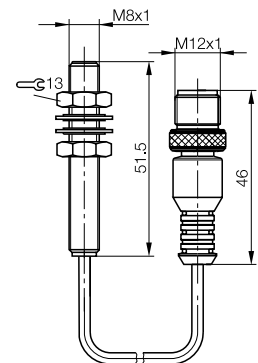
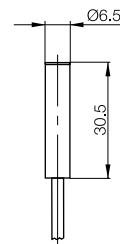
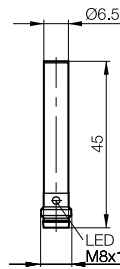
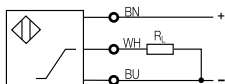
Cable, voltage output



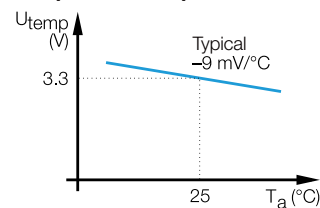
Connector, current output



Cable, current output



Temperature output



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

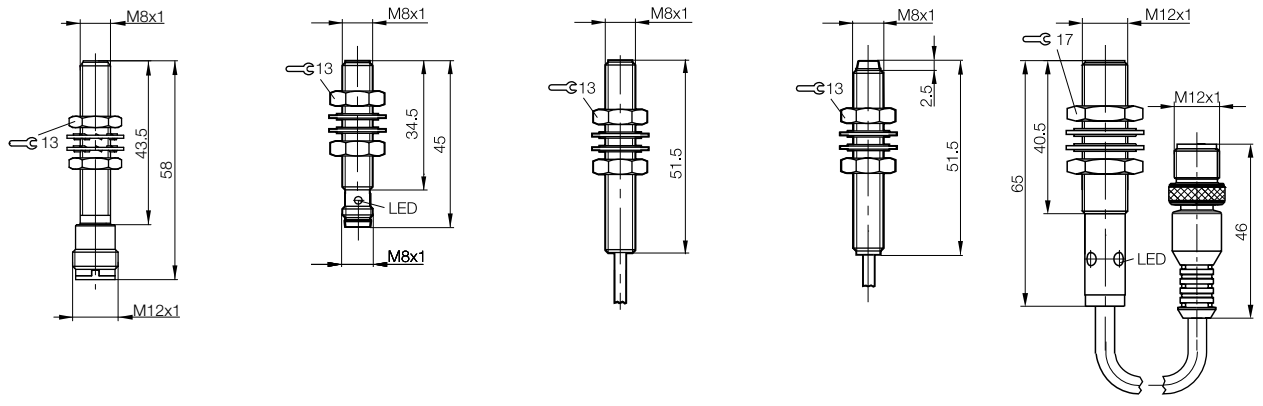
Inductive Sensors for Analog Distance Measurement

Cylinder designs, M8x1, M12x1



M8 x 1	M8 x 1	M8 x 1	M8 x 1	M12x1	
Flush	Flush	Flush	Not flush	Flush	Inductive sensors
Voltage, 0...10 V	Voltage, 0...10 V	Voltage, 0...10 V	Voltage, 0...10 V	Current, 4...20 mA	Global DC 3-wire
0.5...1.5 mm	0.5...1.5 mm	0.5...1.5 mm	0.5...2.5 mm	0.5...2 mm	DC 3-/4-wire
BAW003R	BAW000M	BAW000T	BAW000W	BAW001F	DC 2-wire
BAW M08EH-UAD15B-S04G	BAW M08EF-UAC15B-S49G	BAW M08EI-UAD15B-BP03	BAW M08EI-UAD25F-BP03	BAW M12MG2-ICC20B-BP00,2-GS04	AC/DC 2-wire
15...30 V DC	15...30 V DC	15...30 V DC	15...30 V DC	10...30 V DC	AC 2-wire
250 V AC	250 V AC (□)	250 V AC (□)	250 V AC (□)	250 V AC (□)	Special properties
1 mm	1 mm	1 mm	1.5 mm	1.25 mm	500 Ω
2 kΩ	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
No	Yes	No	No	Yes	–10...+70 °C
–10...+70 °C	–10...+70 °C	–10...+70 °C	–10...+60 °C*	–10...+70 °C	±40.0 μm
±40.0 μm	±40.0 μm	±8.0 μm	±10.0 μm	±5.0 μm	±30 μm
±30 μm	±30 μm	±30 μm	±60 μm	±45 μm	1 kHz
1 kHz	1 kHz	1 kHz	1 kHz	500 Hz	0.5 ms
0.5 ms	0.5 ms	0.5 ms	1 ms	0.5 ms	0 μm/K
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	IP 67	CE, cULus
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus	Stainless steel
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Brass, coated	PBT
PBT	PBT	PBT	PBT	PBT	M12 connector, 3-pin
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
- Yes
- 10...+70 °C
- Analog distance measurement
- ±40.0 μm
- ±30 μm
- 1 kHz
- 0.5 ms
- 0 μm/K
- IP 67
- CE, cULus
- Stainless steel
- PBT
- M12 connector, 3-pin
- M8 connector, 3-pin
- 3 m PUR cable, 3x0.14 mm²
- 3 m PUR cable, 3x0.14 mm²
- 0.2 m PUR cable with M12 connector, 3-pin
- Cylinder designs
- Block designs
- Accessories



Inductive Sensors for Analog Distance Measurement

Cylinder designs, M12x1



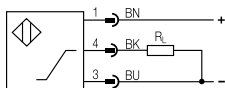
Distance sensors are assigned the linear position sensing and measurement that we have marked in blue.



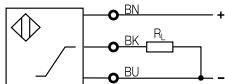
Series	M12x1	M12x1	M12x1
Installation type (pay attention...the note in the Basic Information chapter)	Flush	Flush	Flush
Output signal	Current, 4...20 mA	Voltage, 0...10 V	Voltage, 0...10 V
Linear range s_l	0.5...2 mm	0.5...2 mm	0.5...2 mm
Ordering code	BAW001H	BAW001J	BAW001P
Part name	BAW M12MG2-ICC20B-BP03	BAW M12MG2-UAC20B-BP00,2-GS04	BAW M12MI-UAC20B-S04G
Supply voltage U_B	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}	$\pm 6.0 \mu\text{m}$	$\pm 8.0 \mu\text{m}$	$\pm 8.0 \mu\text{m}$
Non-linearity max.	$\pm 45 \mu\text{m}$	$\pm 45 \mu\text{m}$	$\pm 45 \mu\text{m}$
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

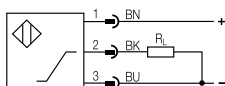
Connector, voltage output



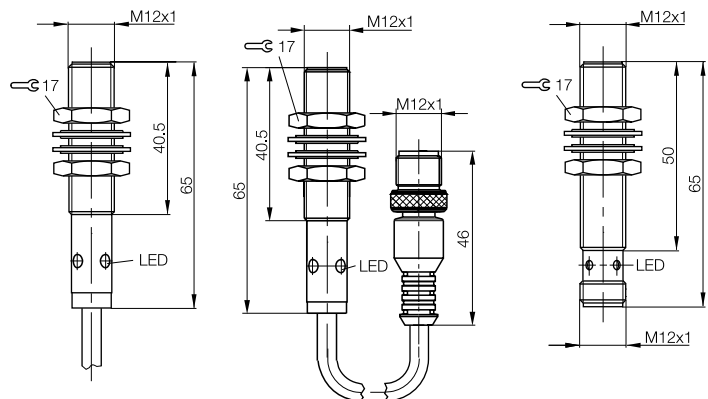
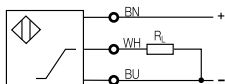
Cable, voltage output



Connector, current output



Cable, current output



Inductive Sensors for Analog Distance Measurement

Cylinder designs, M12x1

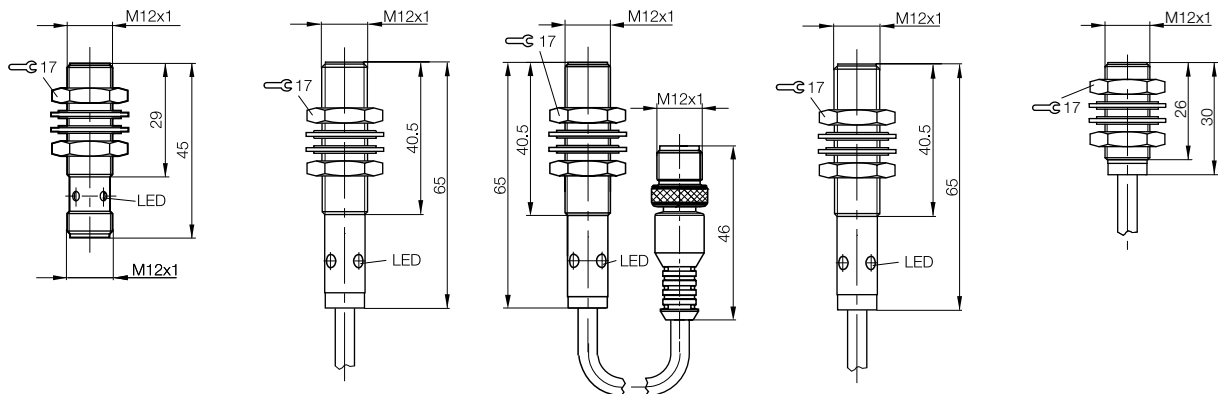


- Inductive sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special properties
- Analog distance measurement
- Cylinder designs
- Block designs
- Accessories

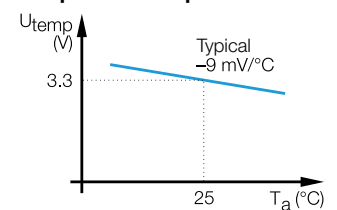


Temperature output

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	BAW0011	
BAW M12ME-UAC20B-S04G	BAW M12MG2-UAC20B-BP03	BAW M12MG2-IAC20B-BP00,2-GS04	BAW M12MG2-IAC20B-BP03	BAW M12ME-UAD50B-BP01	
15...30 V DC	15...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 (□)	75 V DC	
1.25 mm	1.25 mm	1.25 mm	1.25 mm	3 mm	
2 kΩ	2 kΩ			2 kΩ	
		500 Ω	500 Ω		
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	0...+60 °C	
±20.0 μm	±8.0 μm	±5.0 μm	±5.0 μm	±10.0 μm	
±45 μm	±45 μm	±45 μm	±45 μm	±160 μm	
500 Hz	500 Hz	500 Hz	500 Hz	1 kHz	
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	-1.5 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	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	1 m PUR cable, 4x0.25 mm ²	



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



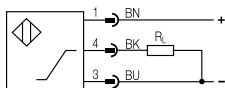
Distance sensors are assigned the linear position sensing and measurement that we have marked in blue.



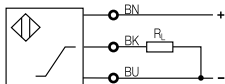
Series	M12x1	M12x1	M12x1
Installation type (pay attention to the note in the Basic Information chapter)	Not flush	Not flush	Not flush
Output signal	Voltage, 0...10 V	Voltage, 0...10 V	Voltage, 0...10 V
Linear range s_l	1...4 mm	1...4 mm	1...4 mm
Ordering code	BAW0014	BAW000Z	BAW0017
Part name	BAW M12MF2-UAC40F-BP00,2-GS04	BAW M12MD-UAC40F-S04G	BAW M12MF2-UAC40F-BP03
Supply voltage U_B	15...30 V DC	15...30 V DC	15...30 V DC
Rated insulation voltage U_i (protection class)	250 V AC (□)	250 V AC (□)	250 V AC (□)
Effective distance s_e	2.5 mm	2.5 mm	2.5 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/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

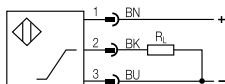
Connector, voltage output



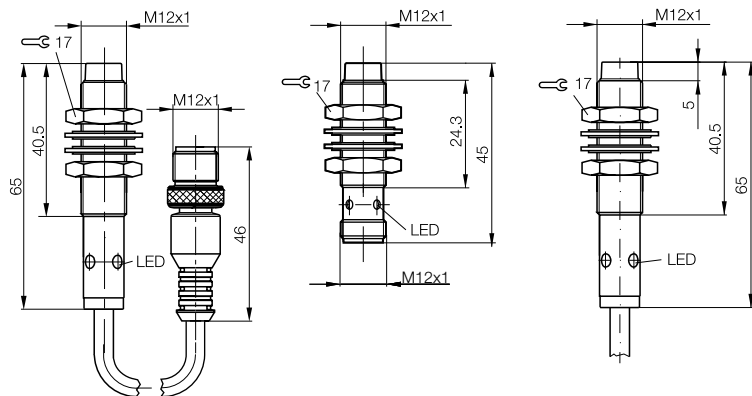
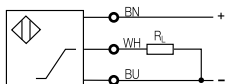
Cable, voltage output



Connector, current output



Cable, current output



Inductive Sensors for Analog Distance Measurement

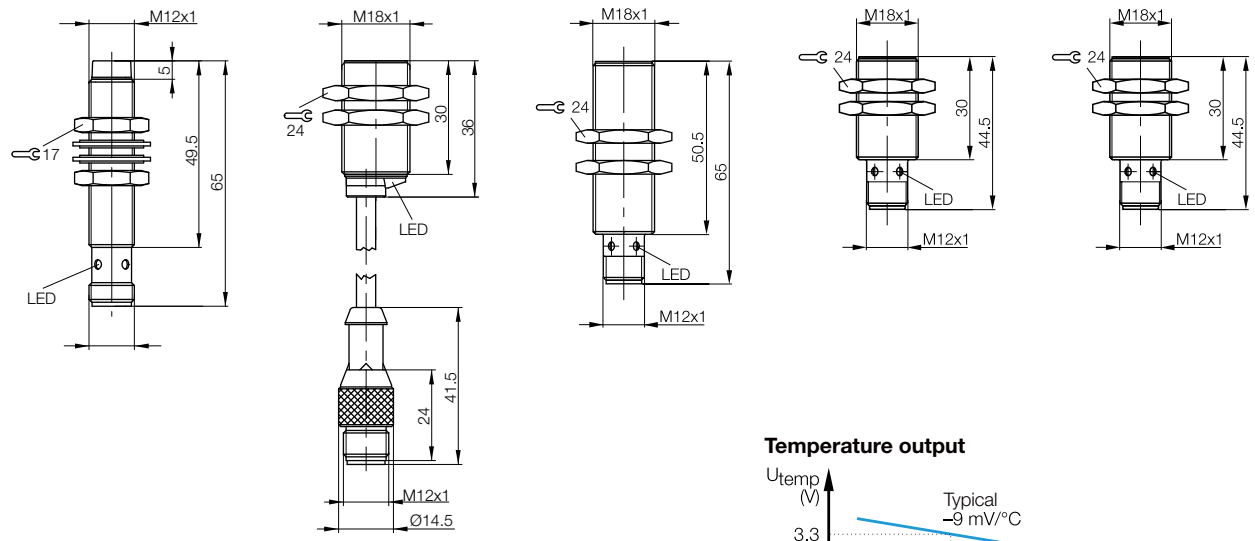
Cylinder designs, M12×1, M18×1



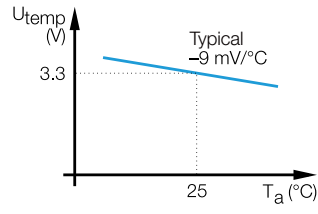
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- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special properties
- Analog distance measurement
- Cylinder designs
- Block designs
- Accessories



M12×1	M18×1	M18×1	M18×1	M18×1	M18×1
Not flush	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	Voltage, 0...10 V
1...4 mm	1...5 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 ohms		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	



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, M18x1



Distance sensors are assigned the linear position sensing and measurement that we have marked in blue.



With teach-in,
3 switching points



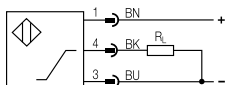
With Teach-in



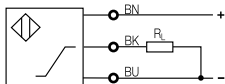
Series	M18x1	M18x1	M18x1
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush	Flush
Output signal	Voltage, 0...10 V	Voltage, 0...10 V	Voltage, 0...10 V
Linear range s_l	1...5 mm	1...5 mm	1...5 mm
Ordering code	BAW002M	BAW002U	BAW0022
Part name	BAW M18M12-UAC50B-BP05-002	BAW M18MM-UAZ50B-BP05-505	BAW M18ME-UAC50B-BP03
Supply voltage U_B	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 $R_{L \text{ min.}}$	2 k Ω	2 k Ω	2 k Ω
Load resistance $R_{L \text{ max.}}$			
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 Sensing surface: PBT	Brass, coated PBT	Brass, coated PBT
Connection	5 m PUR cable, 7x0.25 mm ²	5 m PUR cable, 7x0.25 mm ²	5 m PUR cable, 3x0.34 mm ²

Wiring diagrams

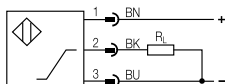
Connector, voltage output



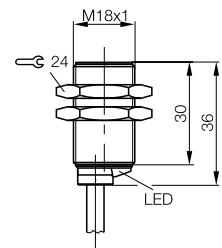
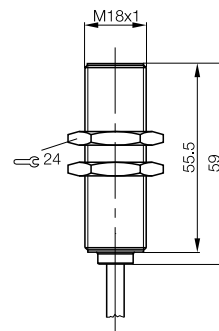
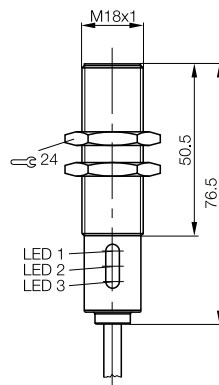
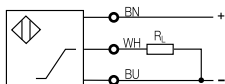
Cable, voltage output



Connector, current output



Cable, current output



Inductive Sensors for Analog Distance Measurement

Cylinder designs, M18x1

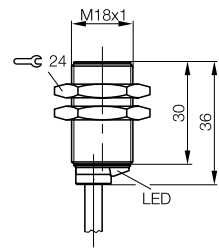
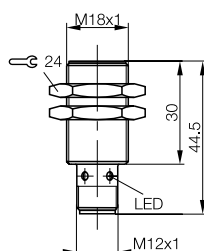
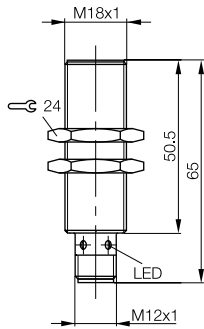
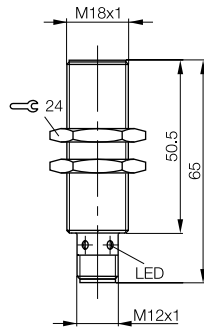
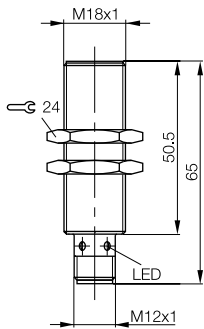


IO-Link



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 mm²

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, M18x1, M30x1.5



Distance sensors are assigned the linear position sensing and measurement that we have marked in blue.



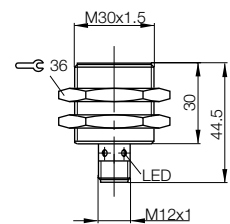
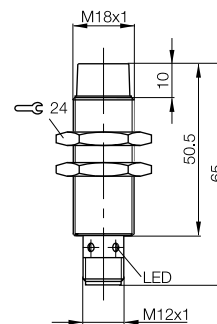
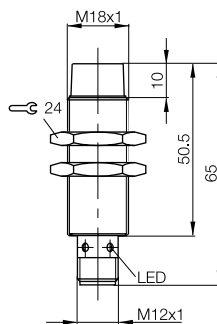
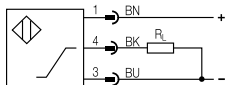
Temperature output

Series	M18x1	M18x1	M30x1.5
Installation type (pay attention to the note 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 name	BAW M18MG-UAC80F-S04G	BAW M18MG-UAC16F-S04G-K	BAW M30ME-UAC10B-S04G
Supply voltage U_B	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

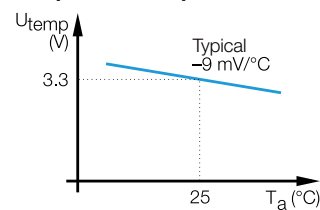
* The function is guaranteed over a range of -10...+70 °C

Wiring diagram

Connector, voltage output



Temperature output



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

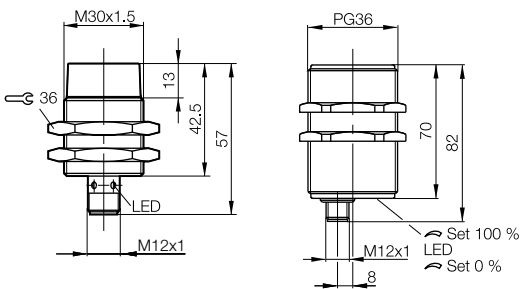
Inductive Sensors for Analog Distance Measurement

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	

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 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



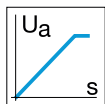
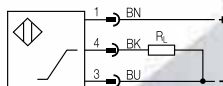
Distance sensors are assigned the linear position sensing and measurement that we have marked in blue.



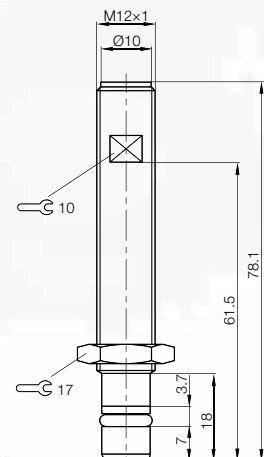
Series	M12×1
Installation (pay attention to the note in the Basic Information chapter)	Flush
Output signal	Voltage, 0...10 V
Linear range s_l	0.5...2 mm
Ordering code	BAW0040
Part name	BAW Z08EO-UAD20B-S04G-H11
Supply voltage U_B	15...30 V DC
Rated insulation voltage U_i (protection class)	75 V DC
Effective distance s_e	1.25 mm
Load resistance $R_{L \min}$	2 k Ω
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}	$\pm 8.0 \mu\text{m}$
Non-linearity max.	$\pm 45 \mu\text{m}$
Limit frequency (-3 dB)	1 kHz
Response time	1 ms
Temperature coefficient, typically in range from +10...+50 °C	-1 $\mu\text{m}/\text{K}$
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



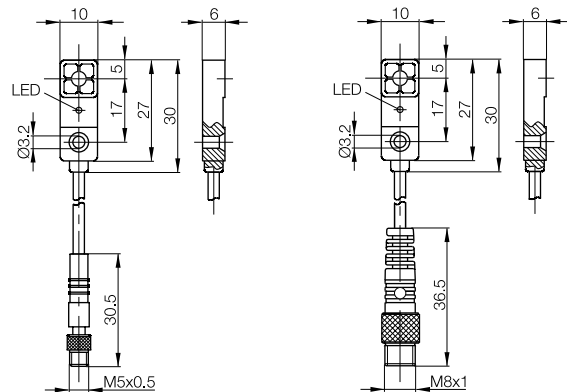
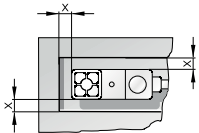
Distance sensors are assigned the linear position sensing and measurement that we have marked in blue.



Series	10×30×6 mm R03	10×30×6 mm R03	
Installation (pay attention to the note in the Basic Information chapter)	Flush	Flush	Inductive sensors
Output signal	Voltage, 0...10 V	Voltage, 0...10 V	Global DC 3-wire
Linear range s_l	1...4 mm	1...4 mm	DC 3-/4-wire
Ordering code	BAW0030	BAW0031	DC 3-/4-wire
Part name	BAW R03KC-UAE40B-BP00,3-GS26	BAW R03KC-UAE40B-BP00,3-GS49	DC 2-wire
Supply voltage U_B	21.6...26.4 V DC	21.6...26.4 V DC	AC/DC 2-wire
Rated insulation voltage U_i (protection class)	75 V DC	75 V DC	AC 2-wire
Effective distance s_e	2.5 mm	2.5 mm	Special properties
Load resistance $R_{L \min}$	5 k Ω	5 k Ω	Analog distance measurement
Polarity reversal protected/transposition protected/short-circuit protected	No/No/No	No/No/No	Cylinder designs
Adjustment display (LED)	Yes	Yes	Block designs
Ambient temperature T_a	0...+70 °C	0...+70 °C	Accessories
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	
Connection	0.3 m PUR cable with M5 connector, 3-pin	0.3 m PUR cable with M8 connector, 3-pin	

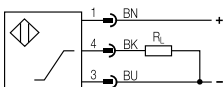
Installation note for BAW R03...

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



Distance sensors are assigned the linear position sensing and measurement that we have marked in blue.

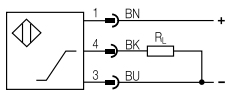


Series	10×30×6 mm R03	20×30×8 mm R06	
Installation type (pay attention to the note in the Basic Information chapter)	Flush	Flush	
Output signal	Voltage, 0...10 V	Voltage, 0...10 V	
Linear range s_l	1...4 mm	0.5...2 mm	
Ordering code	BAW0032	BAW0034	
Part name	BAW R03KC-UAE40B-BP03	BAW R06AC-UAF20B-S49G	
Supply voltage U_B	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	

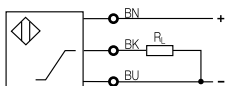
* The function is guaranteed over a range of -10...+70 °C

Wiring diagrams

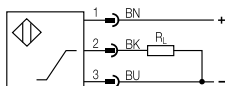
Connector, voltage output



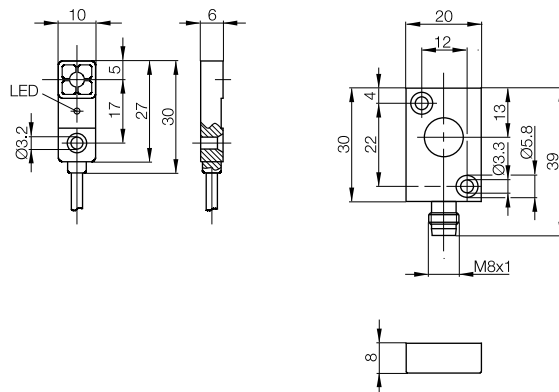
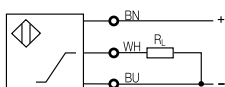
Cable, voltage output



Connector, current output



Cable, current output



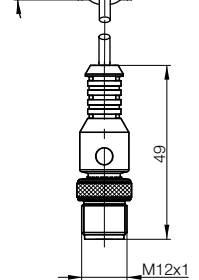
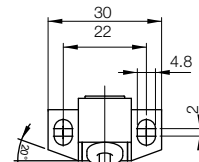
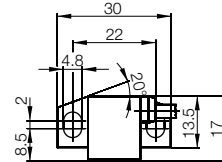
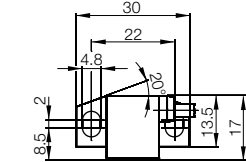
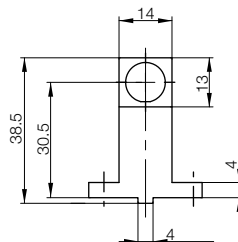
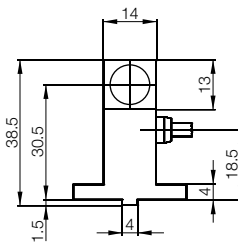
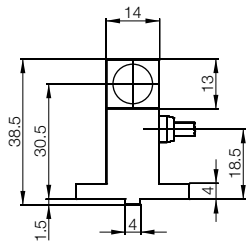
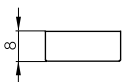
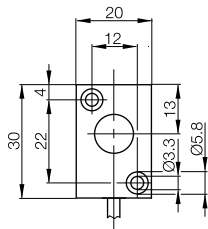
Inductive Sensors for Analog Distance Measurement

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

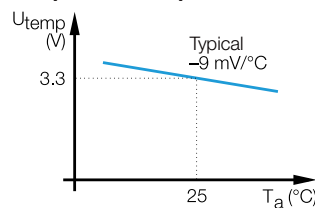


	20×30×8 mm R06	14×38.5×17 mm Z01	14×38.5×17 mm Z01	14×38.5×17 mm Z05
	Flush			
	Voltage, 0...10 V 0.5...2 mm	Voltage, 0...10 V 1...5 mm	IO-Link, falling with rising proximity 1...5 mm	IO-Link, falling with rising proximity 1...5 mm
	BAW0033	BAW003E	BAW003A	BAW003W
	BAW R06AC-UAF20B-EP03	BAW Z01AC-UAD50B-DP03-K	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

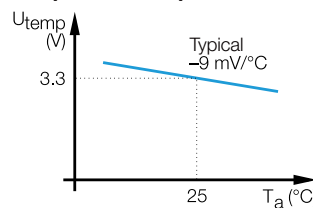


Temperature output



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



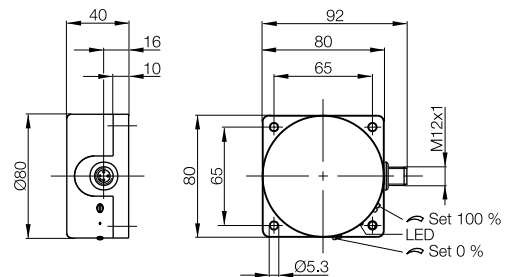
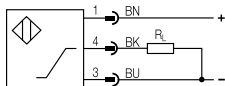
Distance sensors are assigned the linear position sensing and measurement that we have marked in blue.



Series	80×80×40 mm Maxisensor
Installation type (pay attention to the note in the Basic Information chapter)	Not flush
Output signal	Voltage, 0...10 V
Linear range s_l	0...50 mm
Ordering code	BAW003K
Part name	BAW MKK-050.19-S4
Supply voltage U_B	20...30 V DC
Rated insulation voltage U_i	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 Sensing surface
	PBT PBT
Connection	M12 connector, 3-pin

Wiring diagram

Connector, voltage output



Inductive Sensors for Analog Distance Measurement

Block designs, 80×45×20 mm



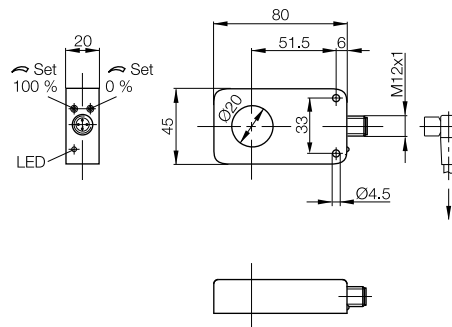
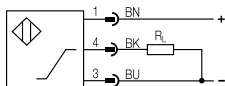
Distance sensors are assigned the linear position sensing and measurement that we have marked in blue.



Series	80×45×20 mm analog ring sensor	Inductive sensors
Installation type (pay attention to the note in the Basic Information chapter)		Global DC 3-wire
Output signal	Voltage, 0...10 V	DC 3-/4-wire
Linear range s_l	0...60 mm	DC 2-wire
Ordering code	BAW003L	AC/DC 2-wire
Part name	BAW MKV-020.19-S4	AC 2-wire
Supply voltage U_B	15...30 V DC	Special properties
Rated insulation voltage U_i	75 V DC	Analog distance measurement
Effective distance s_e	30 mm	Cylinder designs
Load resistance $R_{L \min}$	2 k Ω	Block designs
Polarity reversal protected/transposition protected/short-circuit protected	Yes/No/Yes	Accessories
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	

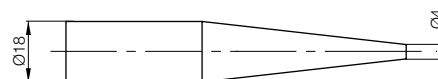
Wiring diagram

Connector, voltage output



Compact analog- ring sensor with 20 mm opening. Various metallic objects or insertion depths result in measured value changes. Applications include thickness measurement of various screws, rods or wires, distance measurement on machines by inserting conical objects in the measuring area of the sensor.

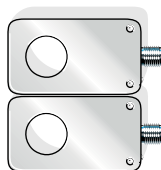
Testing cone for determining insertion depth (measuring range and linearization)



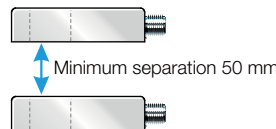
Installation conditions



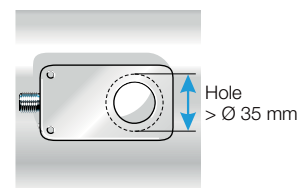
No mutual interference for front-mounting of two sensors.



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 $\text{Ø } 35 \text{ mm}$ 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 devices, there are also assembly aids and protective equipment for the most varied inductive sensors.



Accessories for Inductive Sensors

Contents

Accessories for inductive sensors

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Basic information and definitions can be found on **page 884**.



Accessories for Inductive Sensors

Pulse stretching

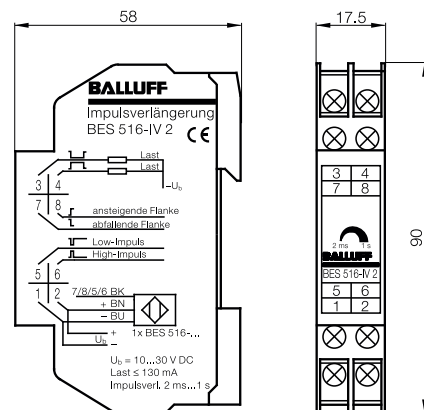
Detecting fast motion

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, with the consequence that 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 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
Repeatability		< 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 capacity		$\leq 0.5 \mu\text{F}/24 \text{ V}$
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).

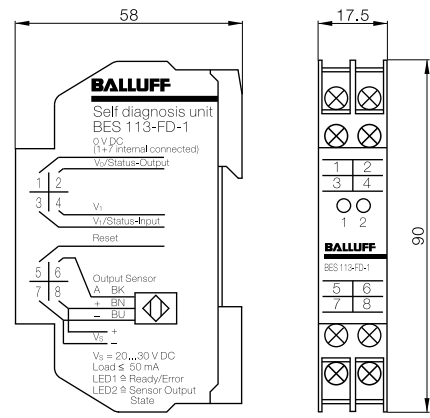
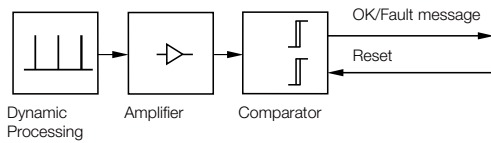
If the BES 113-FD-1 is used as a single unit, terminals VI (3 and 4) must be bridged together.



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	
Conductor cross-section max.	2×2.5 mm ²	

- Inductive sensors
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- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
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- Analog distance measurement
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- Pulse Extension
- Function Diagnostics Unit
- Sensor tester, testing and setting device
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- Protective nuts
- Positive stop
- Tube switch
- Contact protector
- Clamping holder overview

Function principle



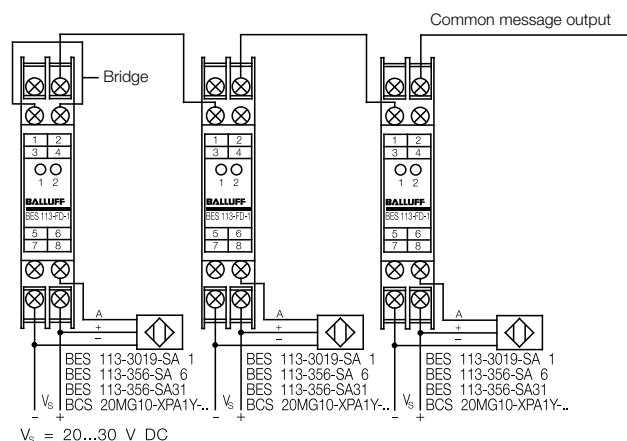
Cascading

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

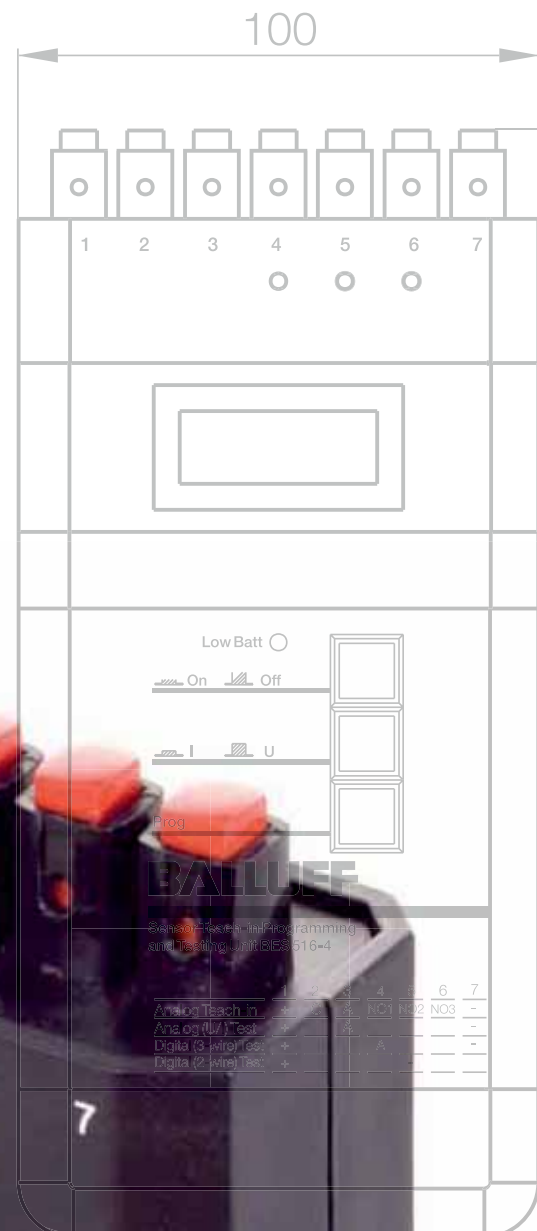
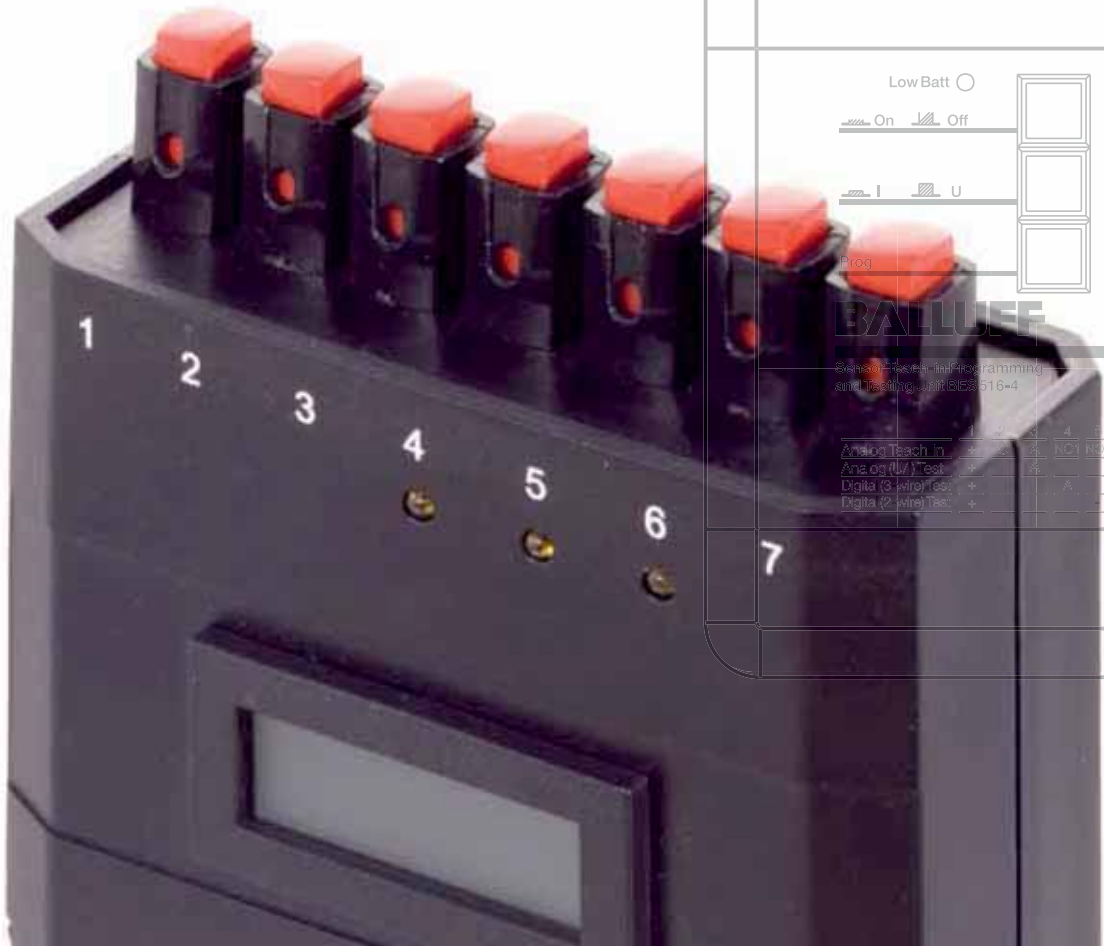
Note

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.



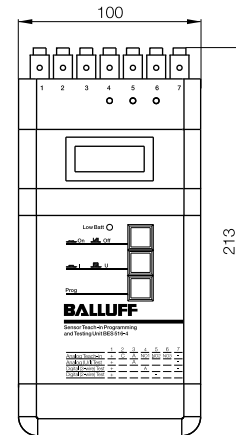
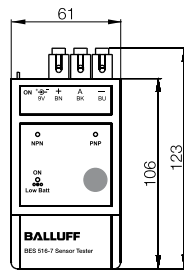
Accessories for Inductive Sensors

Sensor tester, testing and setting device



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

Acoustic and visual signal,
built-in steel measuring plate



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- AC 2-wire
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 - Pulse Extension
 - Function Diagnostics Unit
 - Sensor tester, testing and setting device**
 - Analog switching device
 - Assembly aids for Uni and Unicomact sensors
 - Protective covering for Unicomact sensors
 - Protective nuts
 - Positive stop
 - Tube switch
 - Contact protector
 - Clamping holder overview

Accessories for Inductive Sensors

Analog switching device for onsite assembly for inductive distance sensors BAW

Analog switching device for onsite assembly

This switching device 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 device 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.

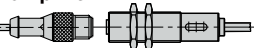


Connection example

Analog sensors



Analog switching amplifier

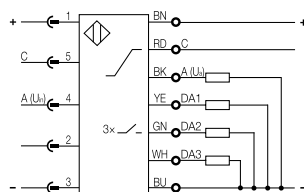


e.g. BOD...

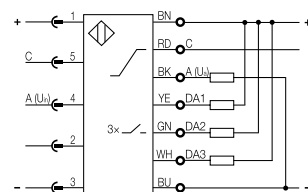
BES 516-615-PS-1-PU-05

Wiring diagrams

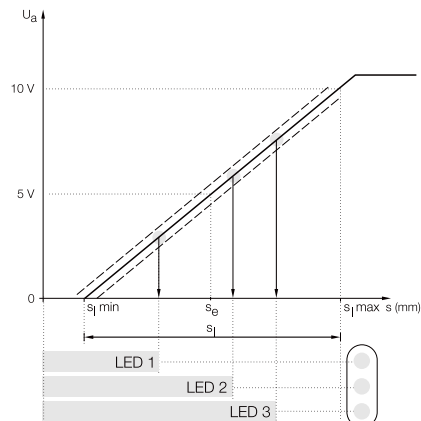
PNP analog and PNP normally open



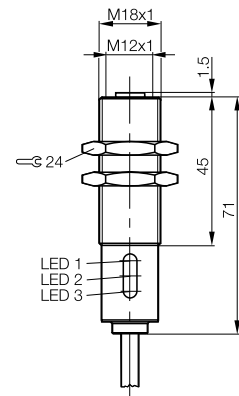
PNP analog and NPN normally open



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_o	15...30 V DC	
Supply voltage U_s	15...30 V DC	
Residual ripple	$\leq 15\%$ of U_o	
Rated insulation voltage U_i	75 V DC	
Rated operating current I_o per output	100 mA	
No-load supply current I_0 max.	≤ 20 mA	
Residual 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 device for control cabinet installation for inductive distance sensors BAW

Analog switching device for control cabinet installation

The analog switching device 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 devices (expansion for additional switching points).

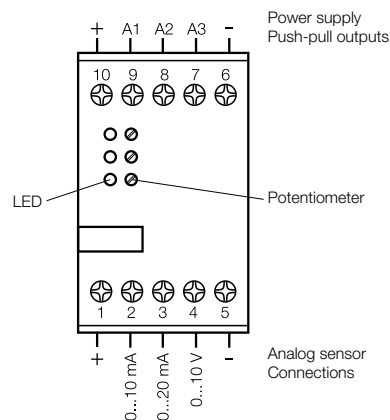
The signal inputs on the analog switching device are protected against polarity reversal and the push-pull output stages against short circuit (internal fuses).



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 ± 10 %
Residual ripple	≤ 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
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- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- AC 2-wire
- Special properties
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- Pulse Extension
- Function Diagnostics Unit
- Sensor tester, testing and setting device
- Analog switching device**
- Assembly aids for Uni and Unicomact sensors
- Protective covering for Unicomact sensors
- Protective nuts
- Positive stop
- Tube switch
- Contact protector
- Clamping holder overview



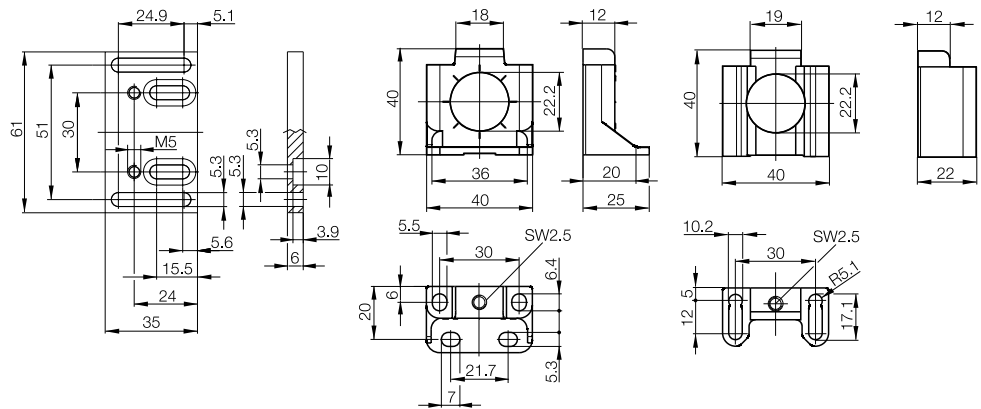
Accessories for Inductive Sensors

Assembly aids for Unicomcompact sensors

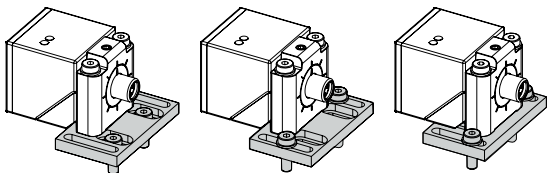


Description	Unicomcompact mounting bracket	Unicomcompact mounting base	Unicomcompact mounting base
Use	for BES Q40KFU-... Unicomcompact sensors (40x40 mm)	for BES Q40KFU-... Unicomcompact sensors (40x40 mm)	for BES Q40KFU-... Unicomcompact sensors (40x40 mm)
Ordering code	BAM00JW	BAM00JY	BAM00JZ
Part 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



Accessories for Inductive Sensors

Assembly aids for Unicomact sensors



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 device

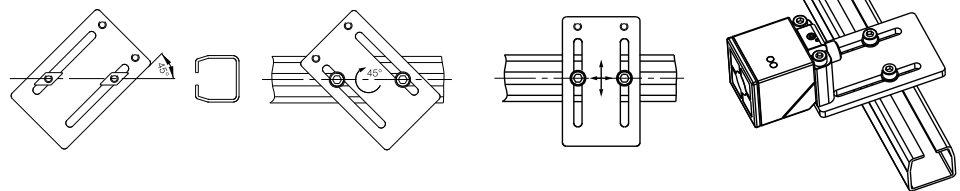
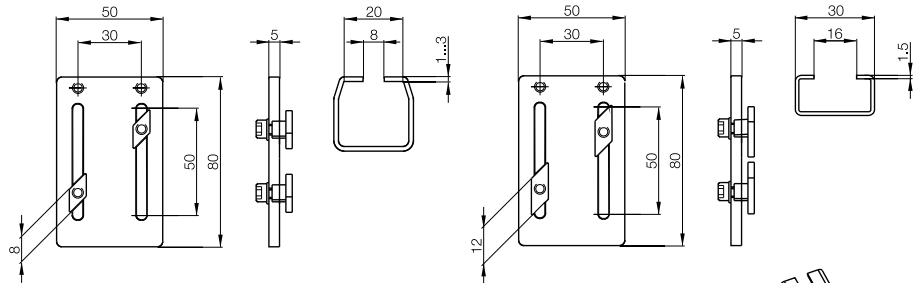
Assembly aids for Uni and Unicomact sensors

Protective covering for Unicomact sensors
Protective nuts
Positive stop
Tube switch
Contact protector
Clamping holder overview

Description	Unicomact holding system	Unicomact holding system
Use	Unicomact sensors for fastening to profile rails (groove width: 8 mm)	Unicomact 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

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

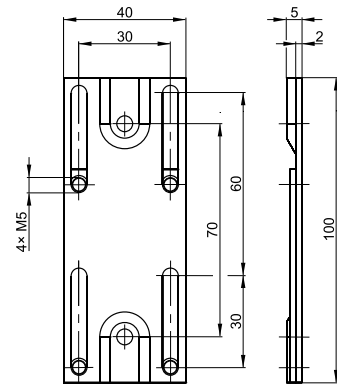


Accessories for Inductive Sensors

Assembly aid for Uni sensors and Unicomact sensors



Description	Mounting plate - Unisensor and Unicomact
Use	For Unisensor and Unicomact sensors (40x40 mm)
Ordering code	
Part number	Montageplatte 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 mounting screws (M5x25; included in scope of delivery) allows the sensor to be easily repositioned at the desired location. Tighten screws!

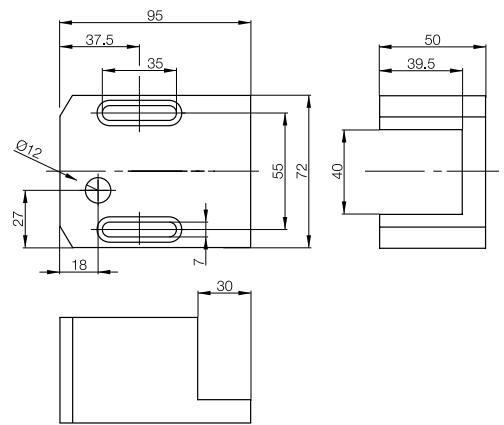
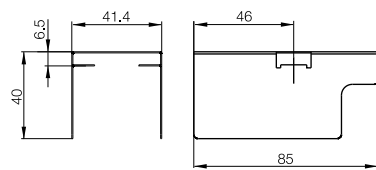


Accessories for Inductive Sensors

Protective coverings for Unicomcompact sensors



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)	Inductive sensors
Ordering code	BAM00K0	BAM00K1	Global
Part number	BES Q40-SH-1	BES Q40-SH-2	DC 3-wire
Material	Anodized aluminum	PA 6	DC 3-/4-wire



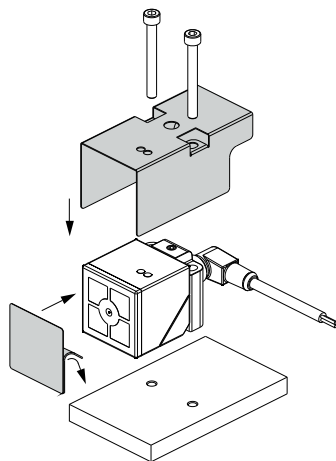
DC 2-wire
AC/DC 2-wire
AC 2-wire
Special properties
Analog distance measurement

Accessories
Pulse
Extension
Function
Diagnostics Unit
Sensor tester, testing and setting device
Analog switching device

Assembly aids for Uni and Unicomcompact sensors

Protective covering for Unicomcompact sensors
Protective nuts
Positive stop
Tube switch
Contact protector
Clamping holder overview

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.

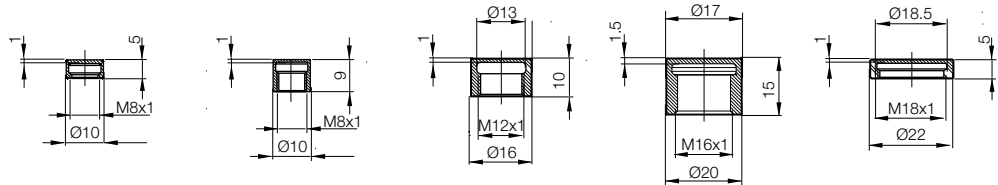


Accessories for Inductive Sensors

Protective nuts



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 splatter. 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.

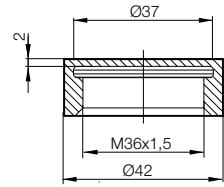
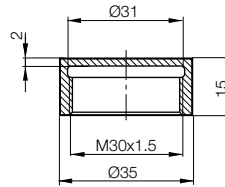
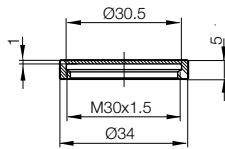
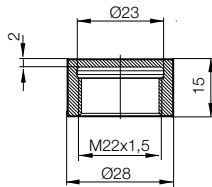
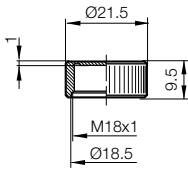
Accessories for Inductive Sensors

Protective nuts



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 device
- Assembly aids for Uni and Unicomact sensors
- Protective covering for Unicomact sensors
- Protective nuts**
- Positive stop
- Tube switch
- Contact protector
- Clamping holder overview



Accessories for Inductive Sensors

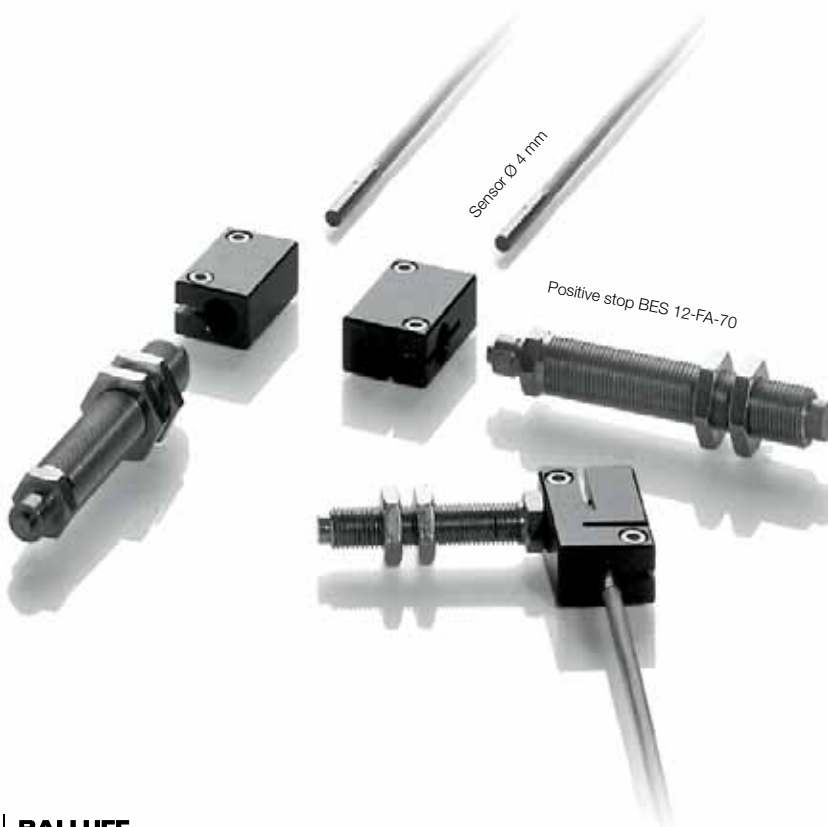
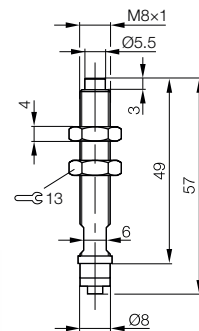
Positive stop

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



Accessories for Inductive Sensors

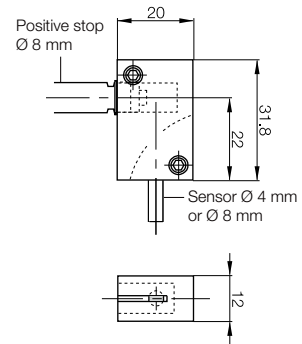
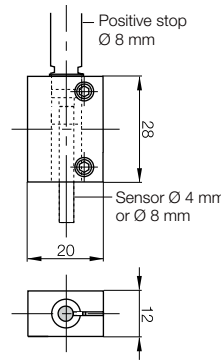
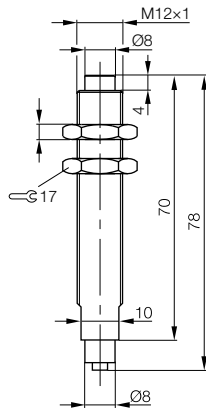
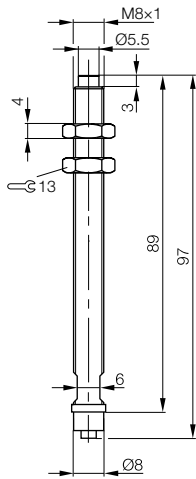
Positive stop, mounting cuff for positive stop



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 device
Assembly aids for Uni and Unicomact sensors
Protective covering for Unicomact sensors
Protective nuts
Positive stop
Tube switch
Contact protector
Clamping holder overview



Accessories for Inductive Sensors

Tube switch

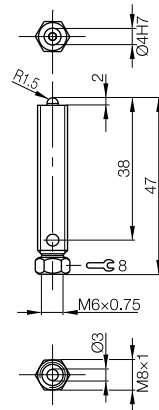
- Mechanical actuation – non-contact switching
- Protects the sensor from mechanical damage
- Plug and safe

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



Accessories for Inductive Sensors

Tube switch



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 device

Assembly aids for Uni and Unicomcompact sensors

Protective covering for Unicomcompact sensors

Protective nuts

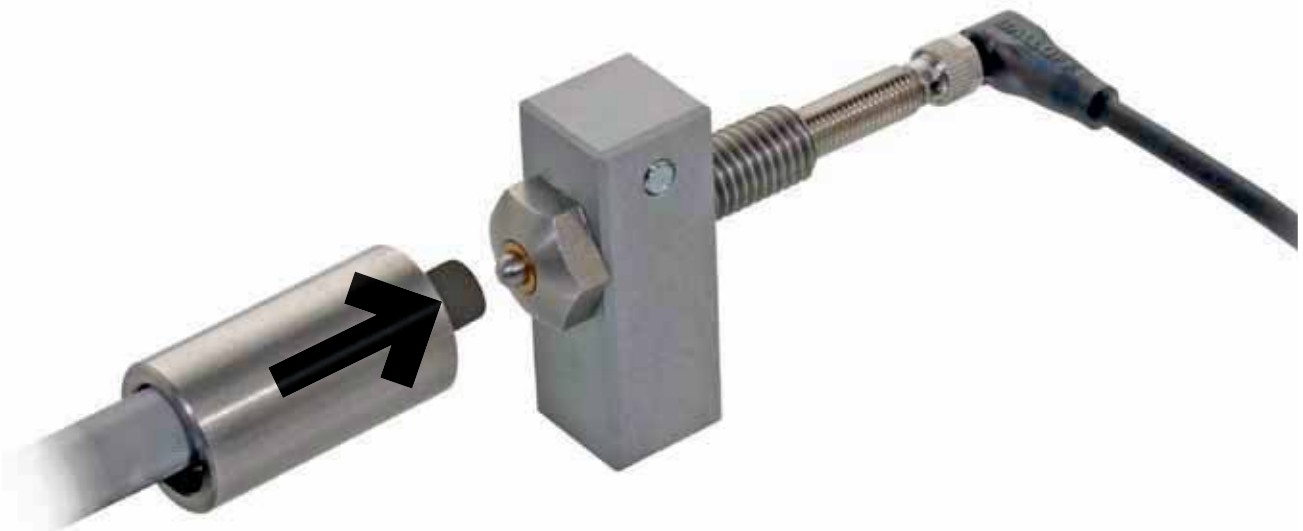
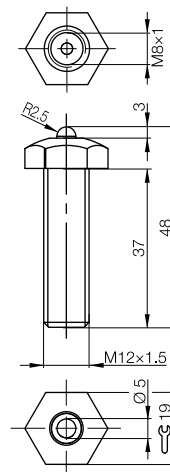
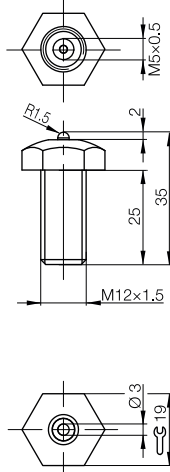
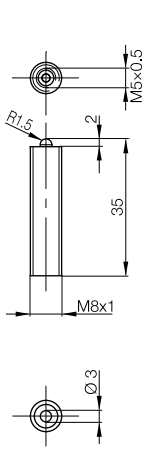
Positive stop

Tube switch

Contact protector

Clamping holder overview

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	



Accessories for Inductive Sensors

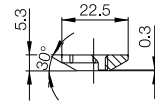
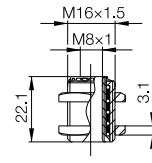
Contact protector

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



Accessories for Inductive Sensors

Contact protector



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 device

Assembly aids for Uni and Unicomact sensors

Protective covering for Unicomact sensors

Protective nuts
Positive stop

Tube switch

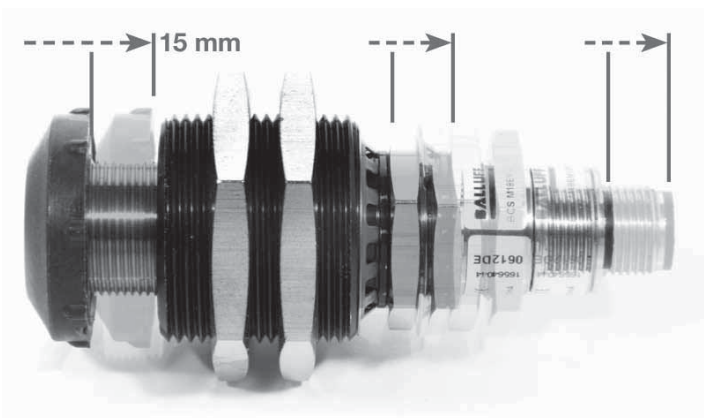
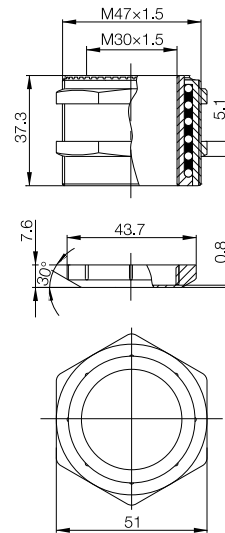
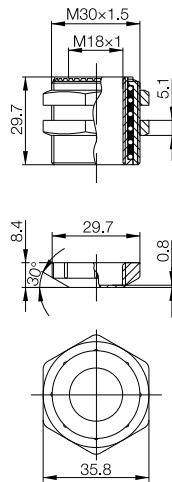
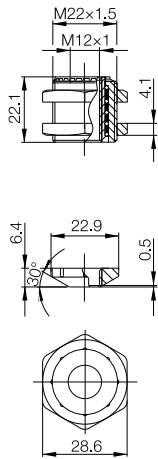
Contact protector

Clamping holder overview

Contact protector
For **M12** sensors for mechanical protection
BAM015W
BESA-12-CM
29
-45...+85 °C
Anodized Al, POM

Contact protector
For **M18** sensors for mechanical protection
BAM015Y
BESA-18-CM
35
-45...+85 °C
Anodized Al, POM

Contact protector
For **M30** sensors for mechanical protection
BAM015Z
BESA-30-CM
51
-45...+85 °C
Anodized Al, POM



Accessories for Inductive Sensors
Clamping holder for cylindrical sensors

- 17× Standard
- 3× Stainless steel
- 10× PTFE-coated, weld-immune



- 12× Standard with latch
- 6× Standard with latch PTFE-coated, weld-immune
- 6× Stainless steel with latch
- 6× Stainless steel with latch PTFE-coated, weld-immune



- 5× For installation in containers



65 Clamping holder variants!

Balluff has revolutionized methods for attaching sensors with the new latch clamping principle. The sensor is inserted into the clamps and secured in position by folding over the latch. The latch can secure any sensor in all areas of the automation sector without the use of tools.



Accessories for Inductive Sensors
Balluff accessories product line



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 device

Assembly aids for Uni and Unicomact sensors

Protective covering for Unicomact sensors

Protective nuts

Positive stop

Tube switch

Contact protector

Clamping holder overview



More mounting accessories can be found in our "Accessories Line" catalog or online at: www.balluff.com