

Inductive Sensors

AC 2-wire inductive sensors

Our standard line in 2-wire AC technology:

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



Cylinder Designs

M12×1

610

M18×1

612

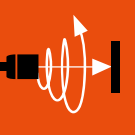
M30×1.5

613

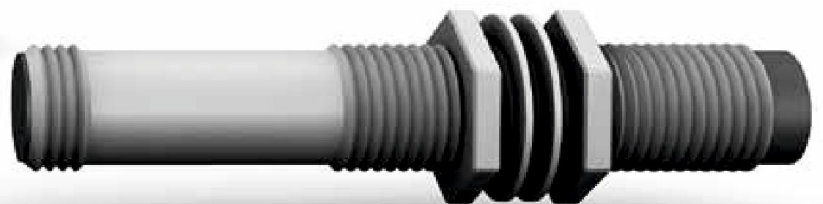
Block Designs

80×80×40 mm (Maxisensor)

615



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



AC 2-wire Inductive Sensors

Cylinder designs, M12x1

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

Recommendation

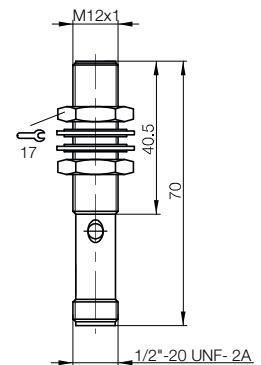
Short-circuit protection equipment: Miniature fuse in accordance with IEC 60127-2 Sheet 1, ≤ 2 A (fast-acting). See attachment-Circuit diagrams. After a short-circuit, check the device for proper function.



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

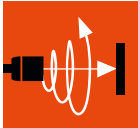
Wiring diagrams, see page 958.
The meaning of switching distance markings can be found on page 962.

Additional cable lengths on request.





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



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

AC 2-wire

Cylinder Designs

Block Designs

Special Properties

Analog Distance Measurement

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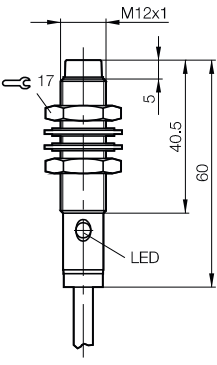
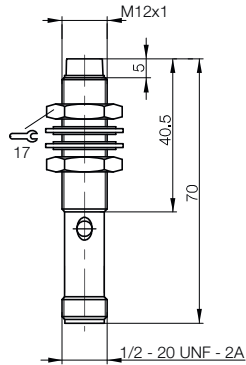
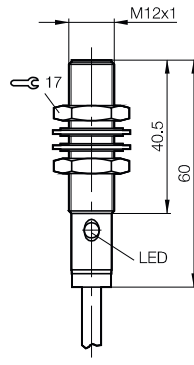
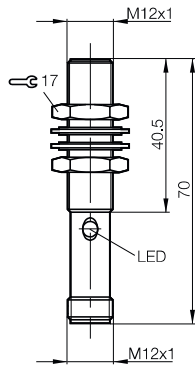
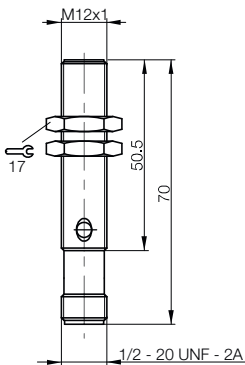
Accessories

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AC 2-wire Inductive Sensors

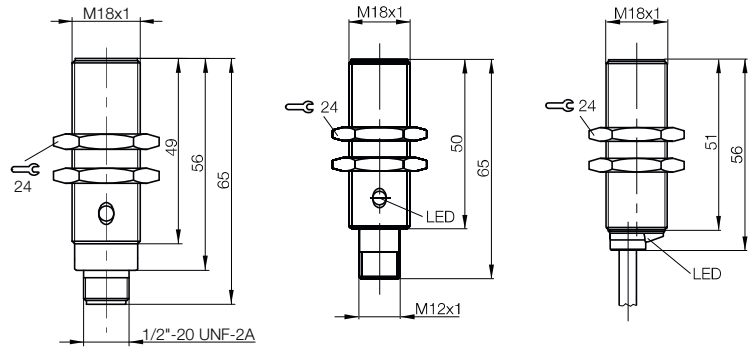
Cylinder designs, M18x1



Model	M18x1	M18x1	M18x1
Installation type (observe instructions in the Basic Information chapter)	Flush	Flush	Flush
Rated switching distance s_n	5 mm	5 mm	5 mm
Assured switching distance s_a	0...4 mm	0...4 mm	0...4 mm
Switching distance marking	■	■	■
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_s	20...250 V AC	20...250 V AC	20...250 V AC
Voltage drop U_d at I_o max.	4 V	4 V	4 V
Rated insulation voltage U_i (protection class)	250 V AC (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 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
	Sensing surface	PA 12	PA 12
Connection	1/2" 20UNF-2A plug connector, 3-pin	M12 connector, 3-pin	2 m PVC cable, 2x0.34 mm ²

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

Additional cable lengths on request.

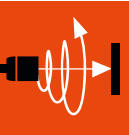


AC 2-wire Inductive Sensors

Cylinder designs, M18x1, M30x1.5

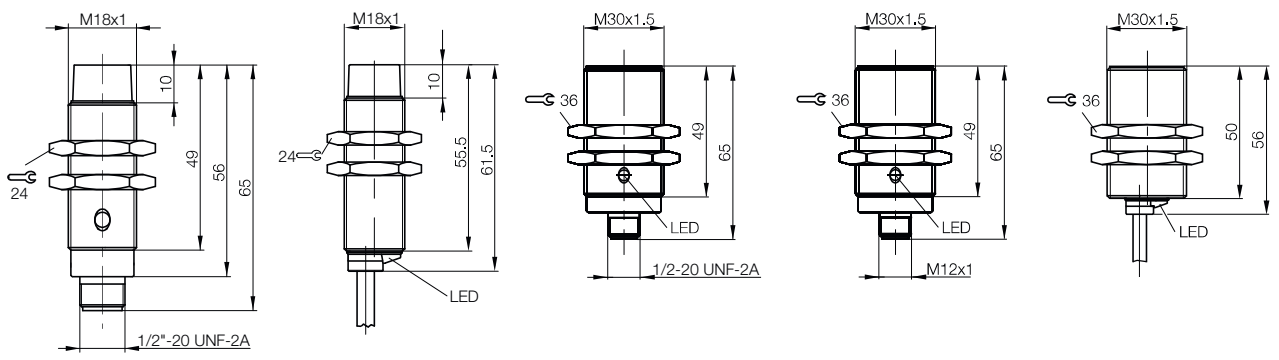


M18x1	M18x1	M30x1.5	M30x1.5	M30x1.5
Not flush	Not flush	Flush	Flush	Flush
8 mm	8 mm	10 mm	10 mm	10 mm
0...6.4 mm	0...6.4 mm	0...8 mm	0...8 mm	0...10 mm
■	■	■	■	■
BES02C7	BES02C5	BES02AT	BES0316	BES02AP
BES 516-437-E5-L-S21	BES 516-437-E4-L-02	BES 516-418-E5-L-S21	BES 516-418-E5-L-S27	BES 516-418-E4-L-02
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



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- 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 Sensors

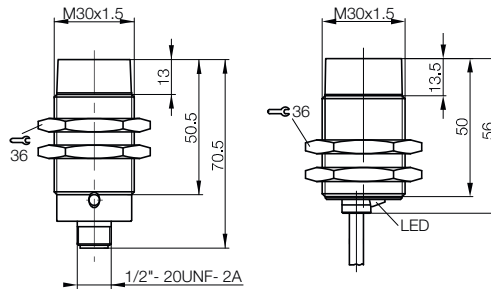
Cylinder designs, M30x1.5



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

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

Additional cable lengths on request.

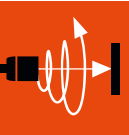


AC 2-wire Inductive Sensors

Block designs, 80×80×40 mm



Model	80×80×40 mm Maxisensor	80×80×40 mm Maxisensor
Installation type (observe instructions in the Basic Information chapter)	Not flush	Not flush
Rated switching distance s_n	50 mm	50 mm
Assured switching distance s_a	0...40 mm	0...40 mm
Switching distance marking	■	■
NO/NC	BES022T	BES022U
programmable	Part number	Part number
	BES 517-460-U5-L-D-S21	BES 517-460-U5-L-D-S5
Supply voltage U_S	20...250 V AC	20...250 V AC
Voltage drop U_d at I_e max.	7 V	7 V
Rated insulation voltage U_i (protection class)	250 V AC (□)	250 V AC (□)
Rated operating current I_e	500 mA	500 mA
Polarity reversal/short-circuit protected	Yes/No	Yes/No
Ambient temperature T_a	-25...+70 °C	-25...+70 °C
Switching frequency f max.	10 Hz	10 Hz
Utilization category	AC 140	AC 140
Function indicator	Yellow LED	Yellow LED
Degree of protection as per IEC 60529	IP 67	IP 67
Approvals	CE, cULus	CE, cULus
Material	Housing: PBT Sensing surface: PBT	Housing: PBT Sensing surface: PBT
Connection	1/2" 20UNF-2A plug connector, 3-pin	7/8" 16UN plug connector, 3-pin



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

AC 2-wire

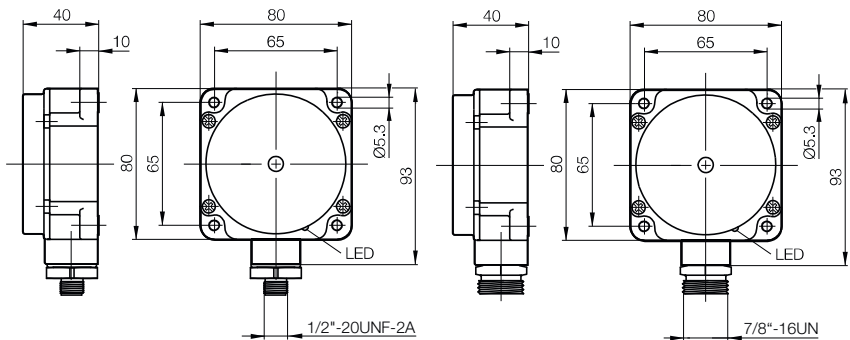
Cylinder Designs
Block Designs

Special Properties

Analog Distance Measurement

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Wiring diagrams, see page 958.
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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

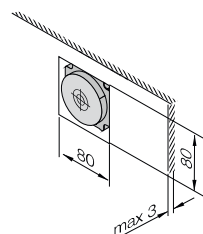


Fig. 1

Mounting in steel/non-ferrous metals

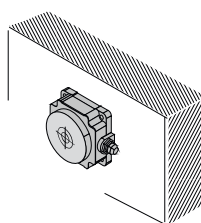


Fig. 2