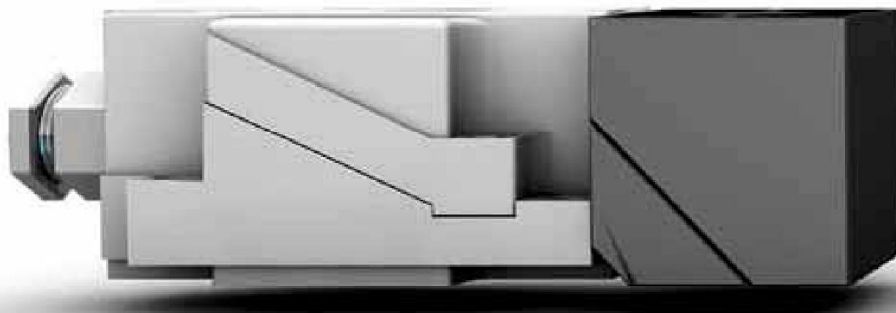


# Inductive Sensors

## AC/DC 2-wire Inductive Sensors

**Our standard product line in the 2-wire version with AC/DC technology:** In this comprehensive product line Balluff offers sensors from M12 to 80x80 mm for virtually every application in the field of automation. These high-quality sensors are designed and manufactured according to worldwide standards and the latest technology. We inspect absolutely every one of our products, providing you the peace of mind that you are receiving only carefully checked sensors.

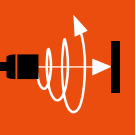


**Cylinder Designs**

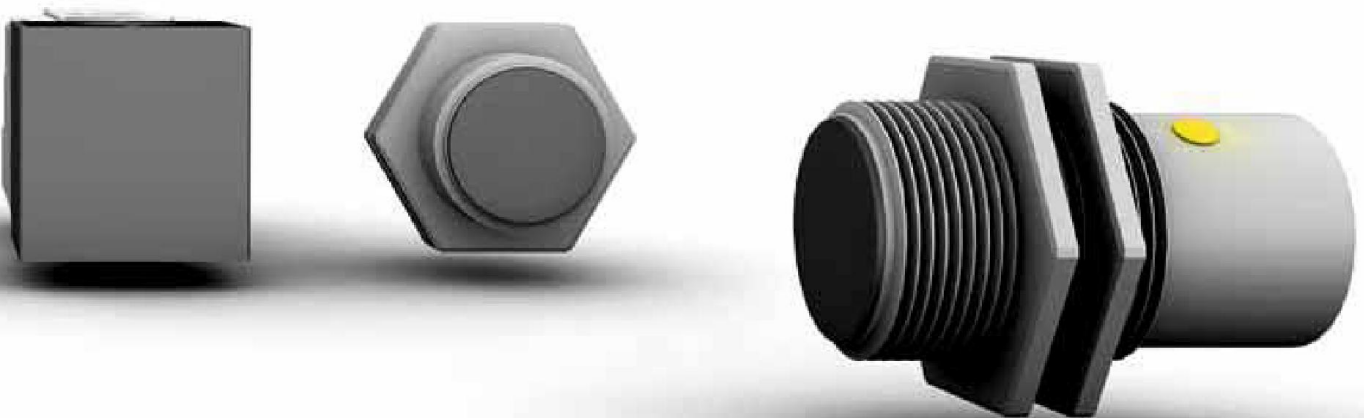
M12×1	591
M18×1	592
M30×1.5	595

**Block Designs**

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



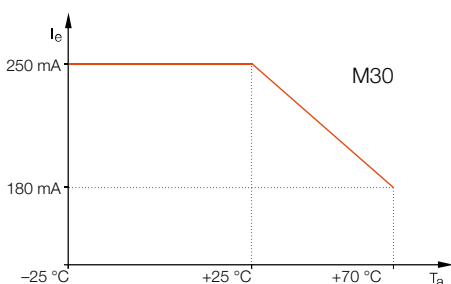
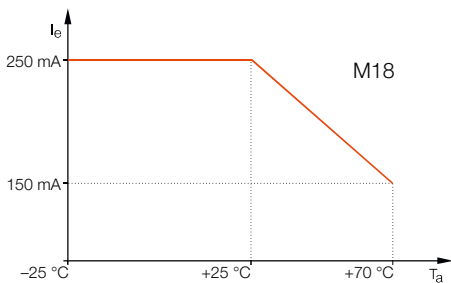
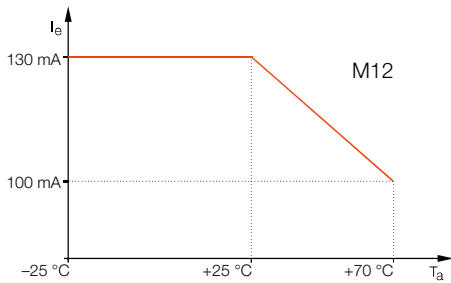
Basic information and definitions can be found on **page 934**.





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

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



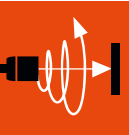
Wiring diagrams, see page 958.

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

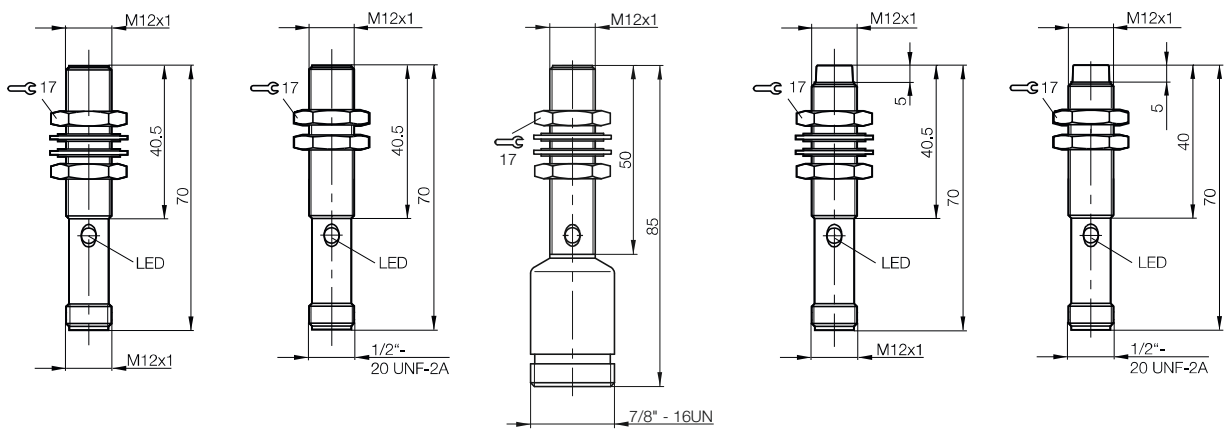
**Cable versions (protection class 2) on request.**



M12x1	M12x1	M12x1	M12x1	M12x1
Flush	Flush	Flush	Not flush	Not flush
<b>2 mm</b>	<b>2 mm</b>	<b>2 mm</b>	<b>4 mm</b>	<b>4 mm</b>
0...1.6 mm	0...1.6 mm	0...1.6 mm	0...3.2 mm	0...3.2 mm
■	■	■	■	■
<b>BES027W</b>	<b>BES02E3</b>	<b>BES027Y</b>	<b>BES028C</b>	<b>BES02E4</b>
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
<b>BES0283</b>		<b>BES0284</b>	<b>BES028K</b>	
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  
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Block Designs  
AC 2-wire  
Special Properties  
Analog Distance Measurement  
Accessories



# AC/DC 2-wire Inductive Sensors

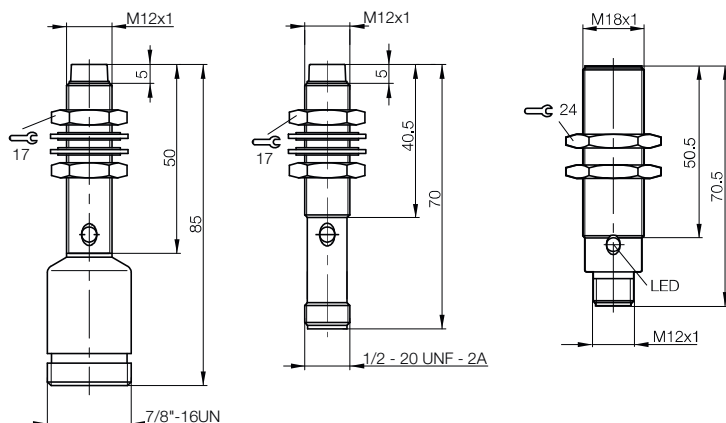
## Cylinder design, M12x1, M18x1



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

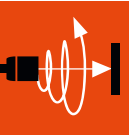
Wiring diagrams, see page 958.  
The meaning of switching distance markings can be found on page 962.

**Cable versions (protection class 2) on request.**

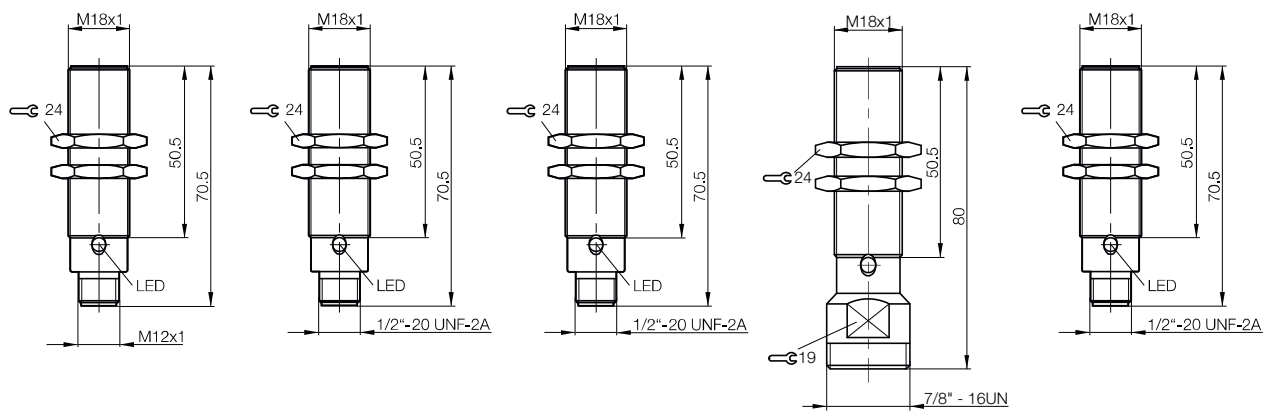




M18x1	M18x1	M18x1	M18x1	M18x1
Flush	Flush	Flush	Flush	Flush
<b>5 mm</b>	<b>5 mm</b>	<b>5 mm</b>	<b>5 mm</b>	<b>8 mm</b>
0...4 mm	0...4 mm	0...4 mm	0...4 mm	0...6.4 mm
■	■	■	■	■ ■
<b>BES02E6</b>	<b>BES028P</b>	<b>BES02E5</b>	<b>BES028T</b>	<b>BES02ZE</b>
BES 515-211-E5-E-S27	BES 516-211-E5-E-S21	BES 515-211-E5-E-S21	BES 516-211-E5-E-S5	BES M18MN-USU80B-S21G
	<b>BES028Z</b>		<b>BES0291</b>	
	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



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# AC/DC 2-wire Inductive Sensors

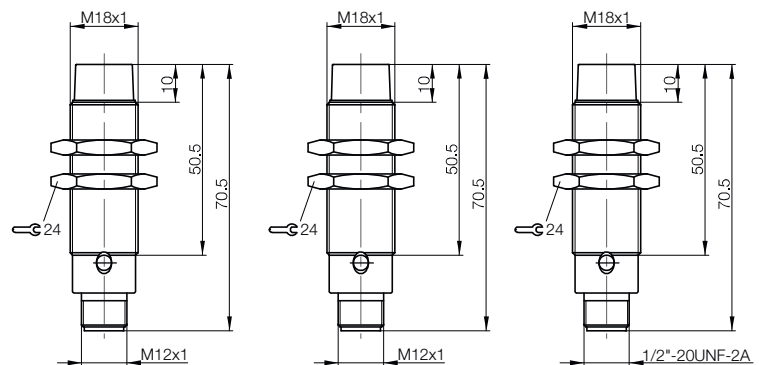
## Cylinder designs, M18x1



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

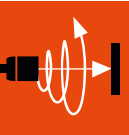
Wiring diagrams, see page 958.  
The meaning of switching distance markings can be found on page 962.

**Cable versions (protection class 2) on request.**

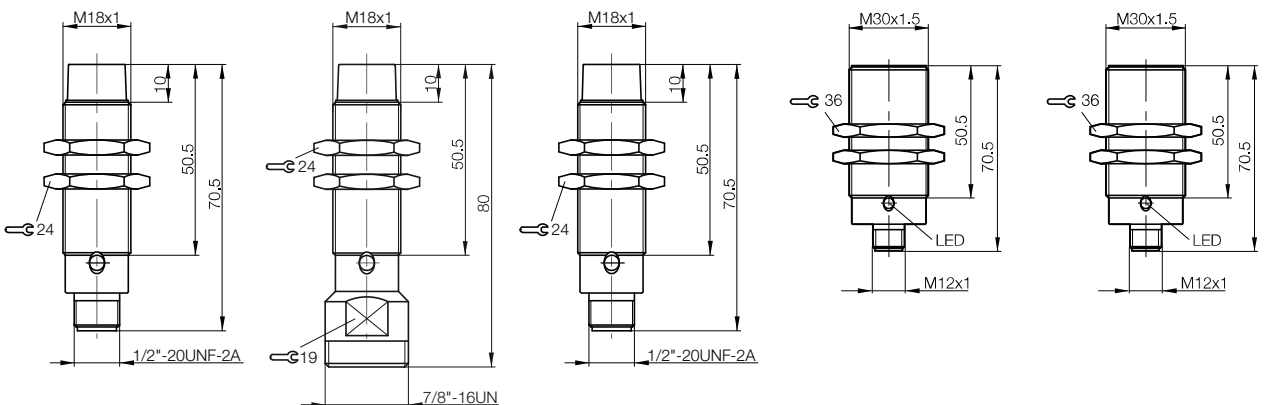




M18x1	M18x1	M18x1	M30x1.5	M30x1.5
Not flush	Not flush	Not flush	Flush	Flush
<b>8 mm</b>	<b>8 mm</b>	<b>16 mm</b>	<b>10 mm</b>	<b>10 mm</b>
0...6.4 mm	0...6.4 mm	0...13 mm	0...8.1 mm	0...8.1 mm
■	■	■ ■	■	■
<b>BES02E7</b>	<b>BES0298</b>	<b>BES029A</b>		<b>BES02EA</b>
BES 515-213-E5-E-S21	BES 516-213-E5-E-S5	BES 516-213-G-E5-E-S21		BES 515-215-E5-E-S27
			<b>BES02A3</b>	
			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



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# AC/DC 2-wire Inductive Sensors

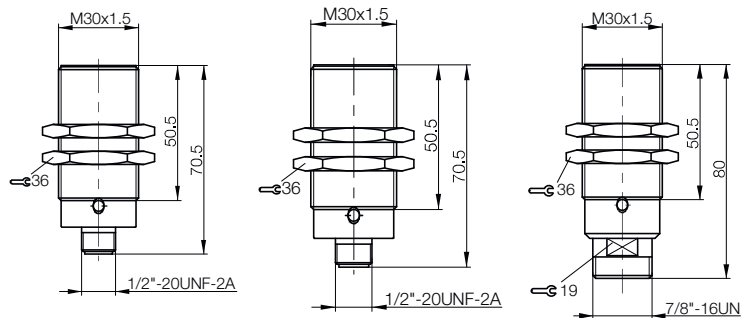
## Cylinder designs, M30x1.5



Model	M30x1.5	M30x1.5	M30x1.5
Installation type (observe instructions in the Basic Information chapter)	Flush	Flush	Flush
Rated switching distance $s_n$	<b>10 mm</b>	<b>10 mm</b>	<b>10 mm</b>
Assured switching distance $s_a$	0...8.1 mm	0...8.1 mm	0...8.1 mm
Switching distance marking	■	■	■
NO	<b>Ordering code</b> Part number	<b>BES029T</b> BES 516-215-E5-E-S21	<b>BES029W</b> BES 516-215-E5-E-S5
NC	<b>Ordering code</b> Part number	<b>BES02A2</b> BES 516-216-E5-E-S21	<b>BES02A4</b> BES 516-216-E5-E-S5
Rated operating voltage $U_o$	110 V AC	110 V AC	110 V AC
Supply voltage $U_S$	20...250 V AC/DC	20...250 V AC/DC	20...250 V AC/DC
Voltage drop $U_d$ at $I_o$ max.	11 V	11 V	11 V
Rated insulation voltage $U_i$	250 V AC	250 V AC	250 V AC
Rated operating current $I_o$	250 mA	250 mA	250 mA
Minimum operating current $I_m$	5 mA	5 mA	5 mA
Residual current $I_r$ max.	1.7 mA	1.7 mA	1.7 mA
Short-term current carrying capacity $I_c$ /time T	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 Sensing surface: PA 12	Stainless steel PA 12	Brass-coated PA 12
Connection	1/2" 20UNF-2A plug connector, 3-pin	1/2" 20UNF-2A plug connector, 3-pin	7/8" 16UN plug connector, 3-pin

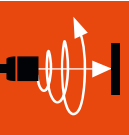
Wiring diagrams, see page 958.  
The meaning of switching distance markings can be found on page 962.

**Cable versions (protection class 2) on request.**

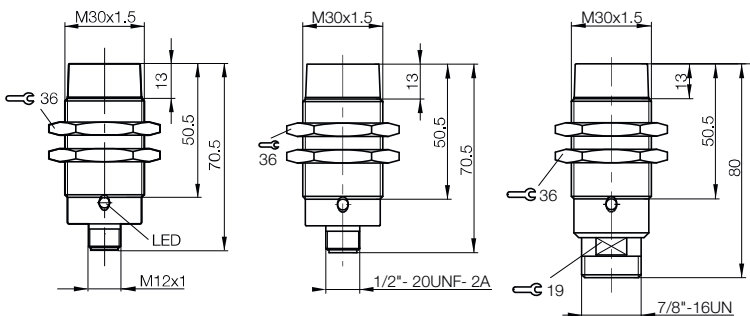




M30x1.5	M30x1.5	M30x1.5		
Not flush	Not flush	Not flush		
<b>15 mm</b>	<b>15 mm</b>	<b>15 mm</b>		
0...12.1 mm	0...12.1 mm	0...12.1 mm		
■	■	■		
<b>BES02AC</b>	<b>BES02AA</b>	<b>BES02AE</b>		
BES 516-217-E5-E-S27	BES 516-217-E5-E-S21	BES 516-217-E5-E-S5		
<b>BES02AL</b>	<b>BES02AK</b>	<b>BES02AM</b>		
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		



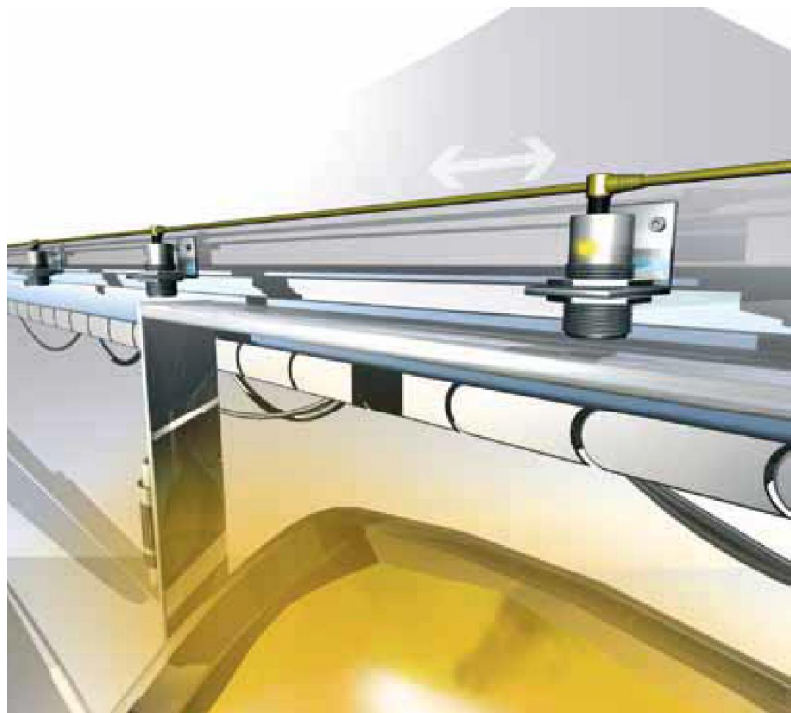
- Inductive Sensors
- Global DC 3-wire
- DC 3-/4-wire
- DC 2-wire
- AC/DC 2-wire
- Cylinder Designs
- Block Designs
- AC 2-wire
- Special Properties
- Analog Distance Measurement
- Accessories

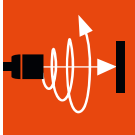


## AC/DC 2-wire Inductive Sensors Sensors in use

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

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



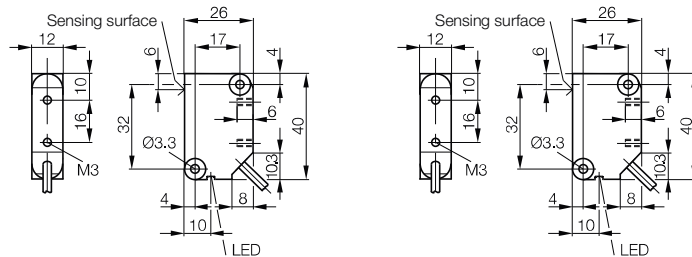


Inductive Sensors  
Global DC 3-wire  
DC 3-/4-wire  
DC 2-wire  
AC/DC 2-wire  
Cylinder Designs  
**Block Designs**  
AC 2-wire  
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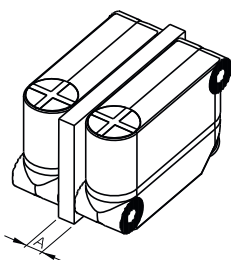
Model	26×40×12 mm R05	26×40×12 mm R05
Installation type (observe instructions in the Basic Information chapter)	Flush	Flush
Rated switching distance $s_n$	<b>2 mm</b>	<b>4 mm</b>
Assured switching distance $s_a$	0...1.6 mm	0...3.2 mm
Switching distance marking	■	■ ■
<b>NO</b>	<b>Ordering code</b>	<b>BES02CT</b>
	Part number	BES R05KB-USU20B-EV02
Rated operating voltage $U_o$	110 V AC	110 V AC
Supply voltage $U_s$	20...250 V AC/DC	20...250 V AC/DC
Voltage drop $U_d$ at $I_o$ max.	12 V	12 V
Rated insulation voltage $U_i$ (protection class)	250 V AC (II)	250 V AC (II)
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 <sup>2</sup>	2 m PVC cable, 2×0.34 mm <sup>2</sup>

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

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



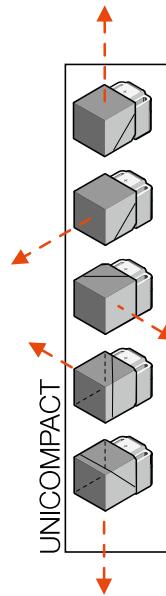
**Row mounting**



- With plastics or no material present in the space:  
Distance A = at least 5 mm
- With metal in the space:  
Distance A = at least 4 mm

# AC/DC 2-wire Inductive Sensors

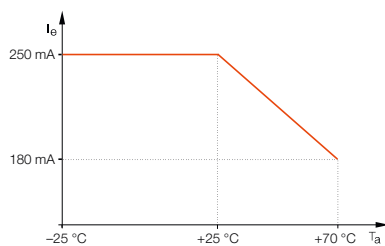
## Block designs, 40x73x40 mm



Note permissible installation variants.

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

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

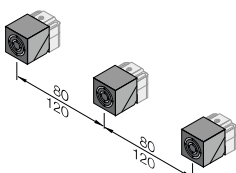


Wiring diagrams, see page 958.

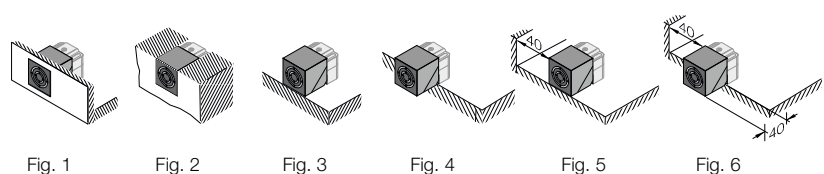
The meaning of switching distance markings can be found on page 962.

### Row mounting

Flush 80 mm, not flush 120 mm

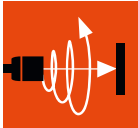


### Installation variations





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



Inductive Sensors

Global DC 3-wire

DC 3-/4-wire

DC 2-wire

AC/DC 2-wire

Cylinder Designs

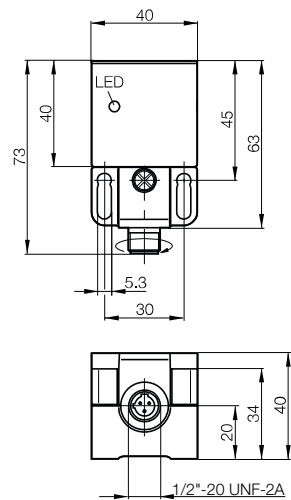
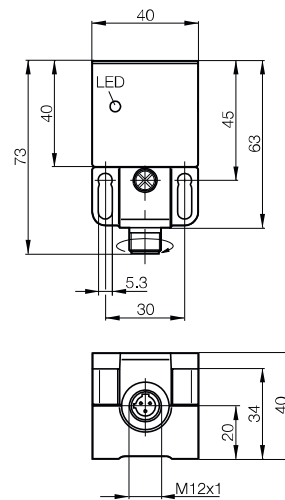
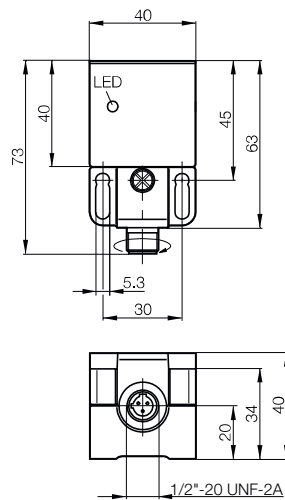
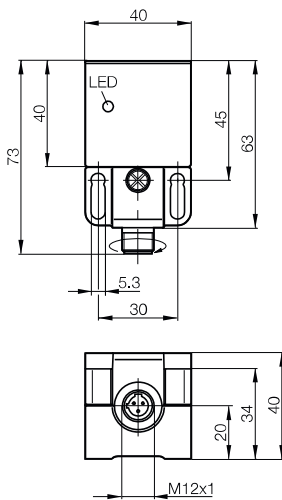
**Block Designs**

AC 2-wire

Special Properties

Analog Distance Measurement

Accessories

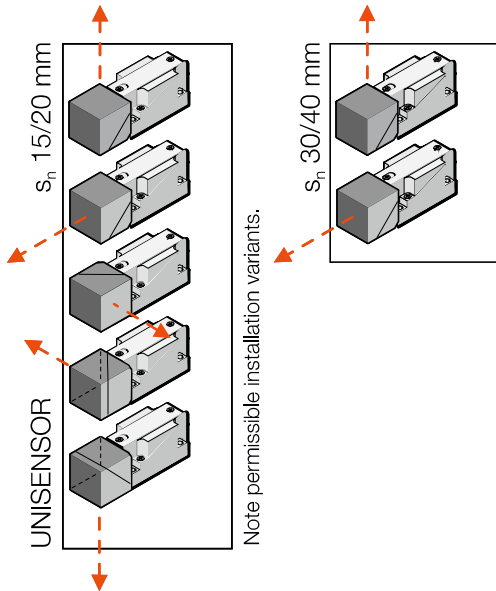


# AC/DC 2-wire Inductive Sensors

## Block designs, 40x120x40 mm

### Programmable Unisensor

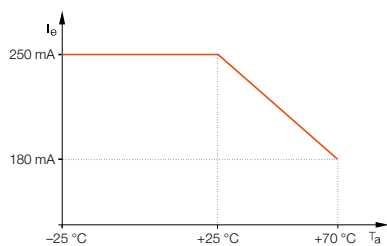
Unisensors can be switched between a normally open function and a normally closed function. A wire jumper is used to change the setting.



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

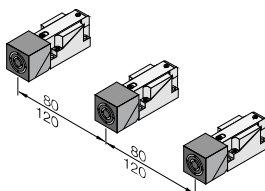
Wiring diagrams, see page 958.  
The meaning of switching distance markings can be found on page 962.

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

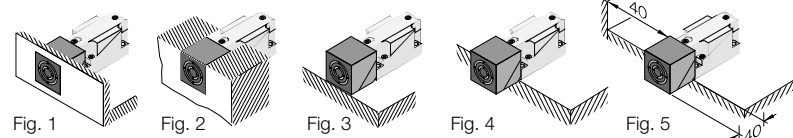


### Row mounting

Flush 80 mm,  
Not flush 120 mm



### Installation variations

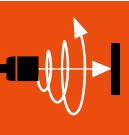


# AC/DC 2-wire Inductive Sensors

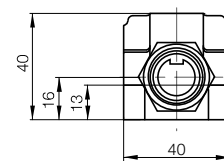
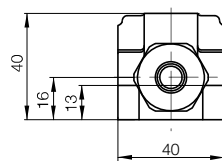
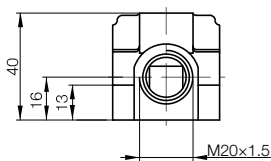
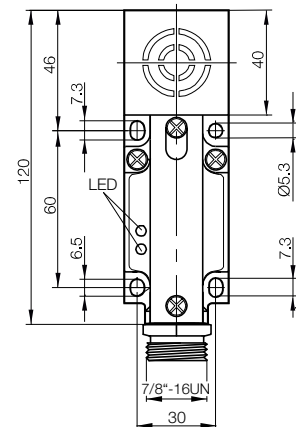
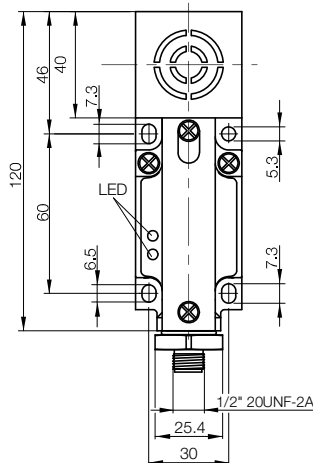
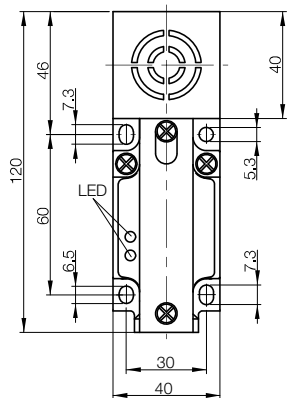
## Block designs, 40×120×40 mm



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



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





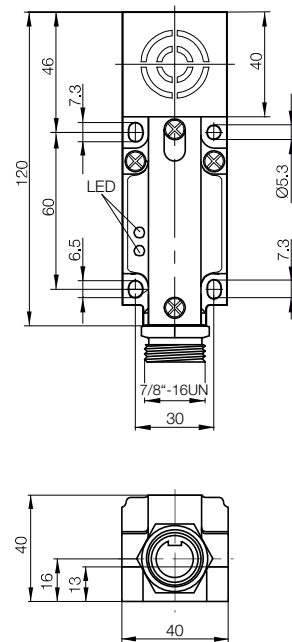
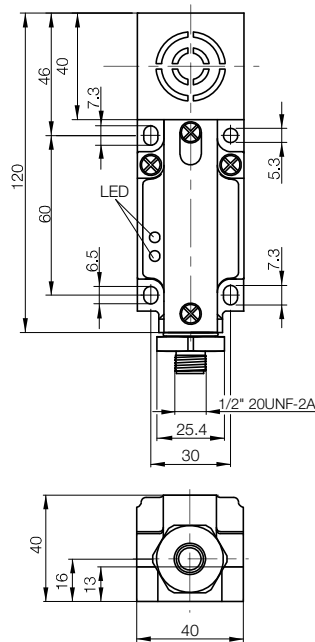
# AC/DC 2-wire Inductive Sensors

## Block designs, 40×120×40 mm



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

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

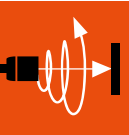


# AC/DC 2-wire Inductive Sensors

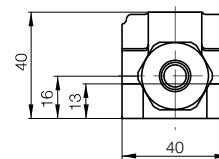
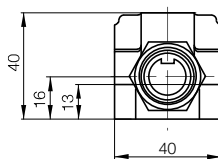
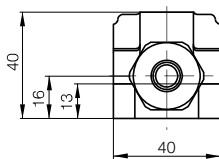
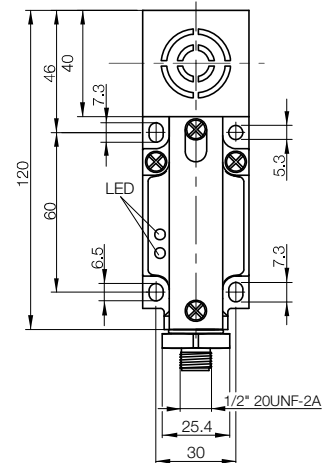
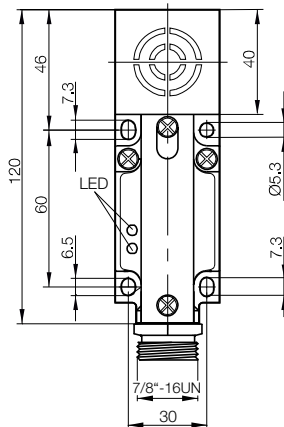
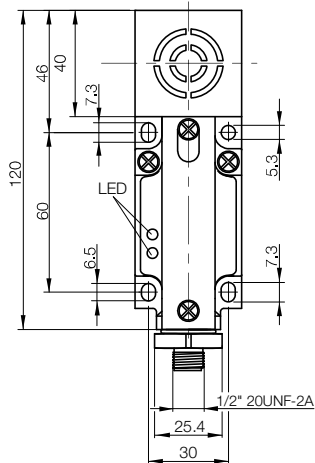
## Block designs, 40×120×40 mm



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



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



# 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.

### Maxisensor can be programmed

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

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

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

### Mounting in non-ferrous metals

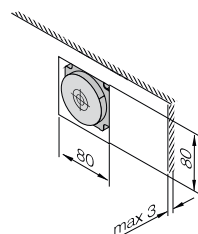


Fig. 1

### Mounting in steel/non-ferrous metals

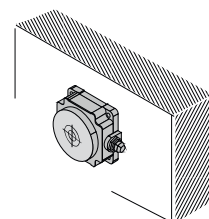


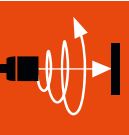
Fig. 2

# 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
<b>50 mm</b>	<b>50 mm</b>	<b>50 mm</b>
0...40.5 mm	0...40.5 mm	0...40.5 mm
■	■	■
<b>BES024F</b>	<b>BES023C</b>	<b>BES01ZJ</b>
BES 517-224-M5-E	BES 517-224-M5-E-S21	BES 517-224-U5-E-S5
110 V AC	110 V AC	110 V AC
20...250 V AC/DC	20...250 V AC/DC	20...250 V AC/DC
11 V	11 V	11 V
250 V AC (□)	250 V AC (□)	250 V AC (□)
250 mA	250 mA	250 mA
5 mA	5 mA	5 mA
≤ 1.7 mA	1700 µA	1700 µA
1 A/20 ms	1 A/20 ms	1 A/20 ms
Yes	Yes	Yes
-25...+70 °C	-25...+70 °C	-25...+70 °C
10 Hz	10 Hz	10 Hz
AC 140/DC 13	AC 140/DC 13	AC 140/DC 13
Yellow LED	Yellow LED	Yellow LED
IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus
PBT	PBT	PBT
PBT	PBT	PBT
Screw terminals	1/2" 20UNF-2A plug connector, 3-pin	7/8" 16UN plug connector, 3-pin



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