

**Inductive Proximity
Sensors**

**AC/DC 2 Wire
Tubular Sensors**

Our 2-wire AC/DC tubular product line includes sensors that range in size from M12 to M30 to meet a wide range of applications.

These sensors are available in a variety of connection styles including cable out, micro connector, and mini connector.

AC/DC 2- Wire Tubular

- 1.68** M12
- 1.69** M12, M18
- 1.70** M18
- 1.71** M18, M30
- 1.72** M30
- 1.73** M30

Contents

Selection
Charts

Part
Numbers

Standard

DC 3-/4-Wire
Tubular

DC 3-/4-Wire
Block

AC 2-Wire
Tubular

**AC/DC 2-Wire
Tubular**

AC/DC 2-Wire
Block

DC 2-Wire
Tubular

Specialty

Welding Sensors
– Factor 1
– Weld Immune

Proximax®

SteelFace™

Proxinox®

High Temp

Ultralinear™

Namur

Large
Housing

Ring
Sensors

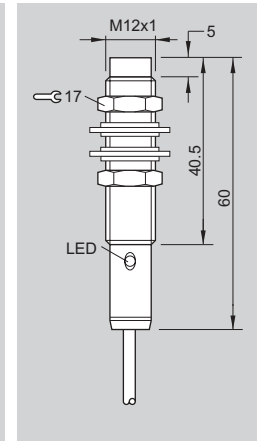
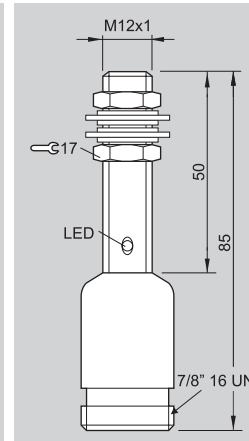
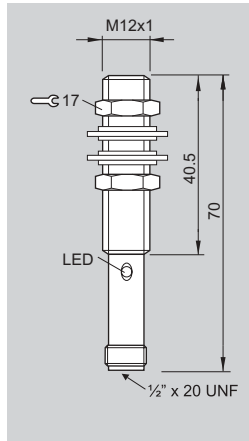
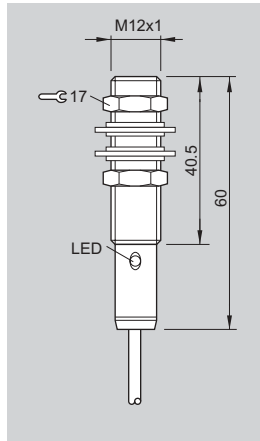
Connectors

Accessories

Technical
Reference

Part
Number
Index

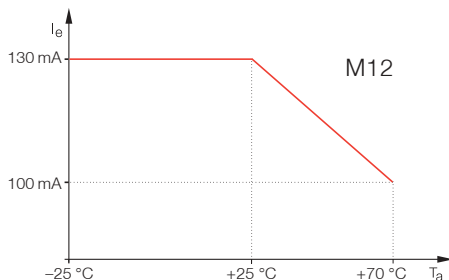
Housing size	M12x1	M12x1	M12x1	M12x1
Mounting	flush	flush	flush	non-flush
Rated operating distance s _n	2 mm	2 mm	2 mm	4 mm
Assured operating distance s _a	0...1.6 mm	0...1.6 mm	0...1.6 mm	0...3.2 mm



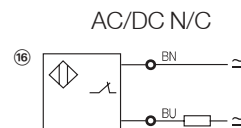
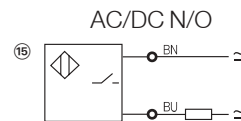
AC/DC	Normally-open 15 17	BES 516-207-B0-E	BES 516-207-S21-E	BES 516-207-S5-E	BES 516-209-B0-E
AC/DC	Normally-closed 16 18	BES 516-208-B0-E	BES 516-208-S21-E	BES 516-208-S5-E	BES 516-210-B0-E
Rated operational voltage U _e	110 Vac	110 Vac	110 Vac	110 Vac	110 Vac
Supply voltage U _B	20...250 Vdc/Vac	20...250 Vdc/Vac	20...250 Vdc/Vac	20...250 Vdc/Vac	20...250 Vdc/Vac
Voltage drop U _d at I _e	≤ 11 V; ≤ 7.5 V dyn.	≤ 11 V; ≤ 7.5 V dyn.	≤ 11 V; ≤ 7.5 V dyn.	≤ 11 V; ≤ 7.5 V dyn.	≤ 11 V; ≤ 7.5 V dyn.
Rated insulation voltage U _i	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac
Rated operational current I _e	130 mA	130 mA	130 mA	130 mA	130 mA
Minimum operational current I _m	5 mA	5 mA	5 mA	5 mA	5 mA
Off-state current I _r	≤ 1.7 mA at 110 Vac	≤ 1.7 mA at 110 Vac	≤ 1.7 mA at 110 Vac	≤ 1.7 mA at 110 Vac	≤ 1.7 mA at 110 Vac
Inrush current I _k t ≤ 20 ms	0.7 A/max. 0.5 Hz	0.7 A/max. 0.5 Hz	0.7 A/max. 0.5 Hz	0.7 A/max. 0.5 Hz	0.7 A/max. 0.5 Hz
Protected against polarity reversal	yes	yes	yes	yes	yes
Short circuit protected	yes	yes	yes	yes	yes
Repeat accuracy R	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
Ambient temperature range T _a	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
Operating frequency f	≤ 1000 Hz	≤ 1000 Hz	≤ 1000 Hz	≤ 1000 Hz	≤ 600 Hz
Utilization categories	AC 140/DC 13	AC 140/DC 13	AC 140/DC 13	AC 140/DC 13	AC 140/DC 13
Function indication	yes	yes	yes	yes	yes
Degree of protection per IEC 529	IP 67	IP 67	IP 67	IP 67	IP 67
Insulation class	II	with protect. GND	with protect. GND	with protect. GND	II
Housing material	stainless steel	stainless steel	stainless steel	stainless steel	stainless steel
Material of sensing face	PA 12	PA 12	PA 12	PA 12	PA 12
Connection	cable	connector	connector	connector	cable
No. of wires x gauge	2 x 22 AWG				2 x 22 AWG
Approvals	cULus	cULus	cULus	cULus	cULus
Recommended connector		C21 AE3-00-VY-150F	C05 AE1-00-VY-150F	C05 AE1-00-VY-150F	

Please specify the cable length for sensors with molded **cable**.
03, 05 = PVC, length 3 m or 5 m
PU-03, PU-05 = PuFlex, length 3 m or 5 m

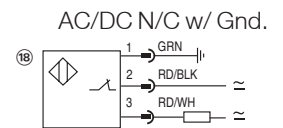
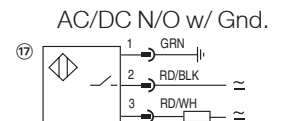
Rated operational current must be derated for temperature



Cable version



Connector version

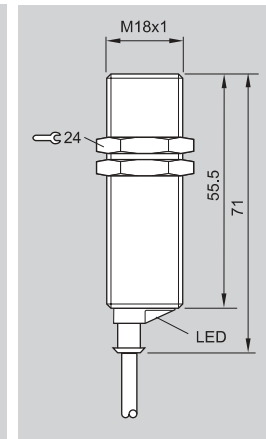
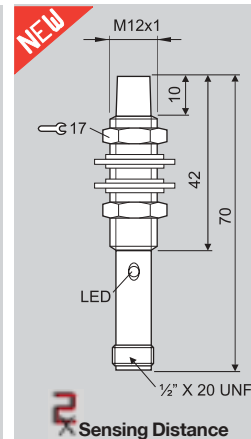
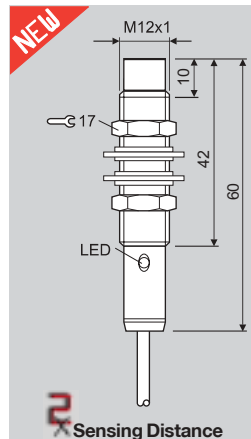
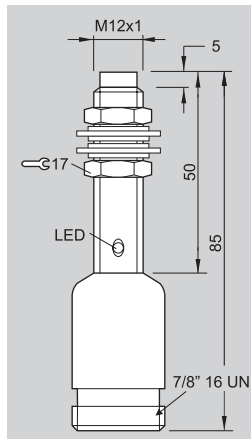
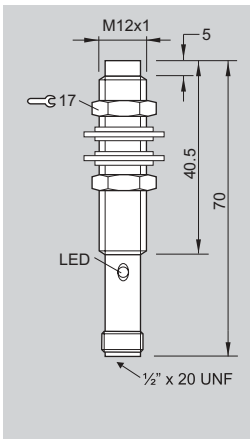


AC/DC 2-Wire

Inductive Sensors

AC/DC 2-Wire
M12, M18
S_n 4, 5, 8 mm

M12x1 non-flush 4 mm 0...3.2 mm	M12x1 non-flush 4 mm 0...3.2 mm	M12x1 non-flush 8 mm 0...6.4 mm	M12x1 non-flush 8 mm 0...6.4 mm	M18x1 flush 5 mm 0...4.1 mm
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BES 516-209-S21-E BES 516-210-S21-E	BES 516-209-S5-E	BES 516-209-G-BO-E-	BES 516-209-G-S21-E	BES 516-211-E6-E-
110 Vac	110 Vac	110 Vac	110 Vac	110 Vac
20...250 Vdc/Vac	20...250 Vdc/Vac	20...250 Vdc/Vac	20...250 Vdc/Vac	20...250 Vdc/Vac
≤ 11 V; ≤ 7.5 V dyn.	≤ 11 V; ≤ 7.5 V dyn.	≤ 11.07 V; ≤ 7.5 V dyn.	≤ 11.0 V; ≤ 7.5 V dyn.	≤ 11.0 V; ≤ 7.5 V dyn.
250 Vac	250 Vac	250 Vac	250 Vac	250 Vac
130 mA	130 mA	130 mA	130 mA	250 mA
5 mA	5 mA	≤ 5 mA	≤ 5 mA	5 mA
≤ 1.7 mA at 110 Vac	≤ 1.7 mA at 110 Vac	≤ 1700 uA	≤ 1700 uA	≤ 1.7 mA at 110 Vac
0.7 A/max. 0.5 Hz	0.7 A/max. 0.5 Hz	0.7 A/max. 0.5 Hz	0.7 A/max. 0.5 Hz	1.5 A/max. 1 Hz
yes	yes	yes	yes	yes
yes	yes	yes	yes	yes
≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
≤ 600 Hz	≤ 600 Hz	≤ 600 Hz	≤ 600 Hz	≤ 400 Hz
AC 140/DC 13	AC 140/DC 13	AC 140/DC 13	AC 140/DC 13	AC 140/DC 13
yes	yes	yes	yes	yes
IP 67	IP 67	IP 67	IP 67	IP 67
with protect. GND	with protect. GND	□	with protect. GND	□
stainless steel	stainless steel	stainless steel	stainless steel	nickel plated brass
PA 12	PA 12	PBTP	PBTP	PA 12
connector	connector	cable	connector	cable
		2x22 AWG		2 x 22 AWG
cULus	cULus	cULus	cULus	cULus
C21 AE3-00-VY-150F	C05 AE1-00-VY-150F		C21 AE3-00-VY-150F	



- For mounting brackets & accessories see section 7.
- For mating connectors see section 6.

Inductive

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Contents
Selection Charts
Part Numbers

Standard

DC 3-/4-Wire Tubular
DC 3-/4-Wire Block
AC 2-Wire Tubular
AC/DC 2-Wire Tubular
AC/DC 2-Wire Block
DC 2-Wire Tubular

Specialty

Welding Sensors
- Factor 1
- Weld Immune
Proximax®
SteelFace™
Proinox®
High Temp
Ultralinear™
Namur
Large Housing
Ring Sensors

6

Connectors

7

Accessories

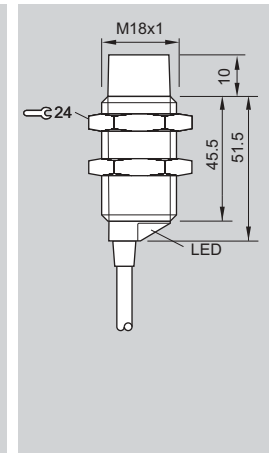
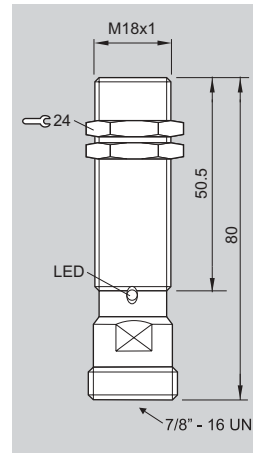
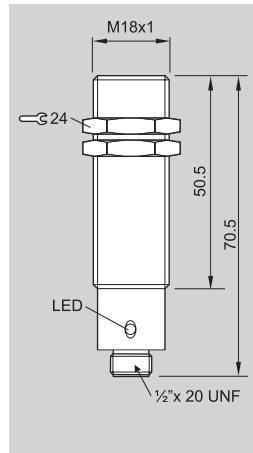
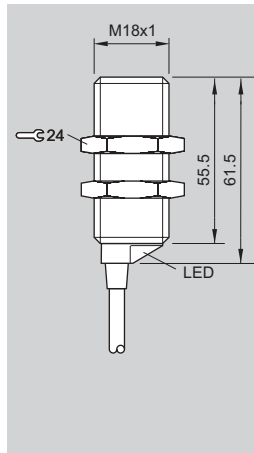
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Technical Reference

p

Part Number Index

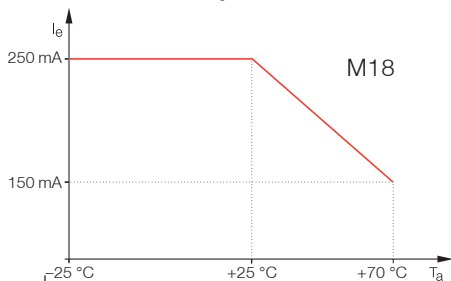
Housing size	M18x1	M18x1	M18x1	M18x1
Mounting	flush	flush	flush	non-flush
Rated operating distance s _n	5 mm	5 mm	5 mm	8 mm
Assured operating distance s _a	0...4 mm	0...4 mm	0...4 mm	0...6.4 mm



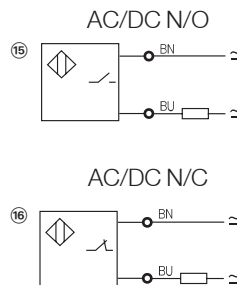
AC/DC	Normally-open 15 17	BES 516-211-E4-E-	BES 516-211-E5-E-S21	BES 516-211-E5-E-S5	BES 516-213-E4-E-
AC/DC	Normally-closed 16 18	BES 516-212-E4-E-	BES 516-212-E5-E-S21	BES 516-212-E5-E-S5	BES 516-214-E4-E-
Rated operational voltage U _e	110 Vac	110 Vac	110 Vac	110 Vac	110 Vac
Supply voltage U _B	20...250 Vdc/Vac	20...250 Vdc/Vac	20...250 Vdc/Vac	20...250 Vdc/Vac	20...250 Vdc/Vac
Voltage drop U _d at I _e	≤ 11.0 V; ≤ 7.5 V dyn.	≤ 11.0 V; ≤ 7.5 V dyn.	≤ 11.0 V; ≤ 7.5 V dyn.	≤ 11.0 V; ≤ 7.5 V dyn.	≤ 11.0 V; ≤ 7.5 V dyn.
Rated insulation voltage U _i	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac
Rated operational current I _e	250 mA	250 mA	250 mA	250 mA	250 mA
Minimum operational current I _m	5 mA	5 mA	5 mA	5 mA	5 mA
Off-state current I _r	≤ 1.7 mA at 110 Vac	≤ 1.7 mA at 110 Vac	≤ 1.7 mA at 110 Vac	≤ 1.7 mA at 110 Vac	≤ 1.7 mA at 110 Vac
Inrush current I _k t = 20 ms	1.5 A/max. 1 Hz	1.5 A/max. 1 Hz	1.5 A/max. 1 Hz	1.5 A/max. 1 Hz	1.5 A/max. 1 Hz
Protected against polarity reversal	yes	yes	yes	yes	yes
Short circuit protected	yes	yes	yes	yes	yes
Repeat accuracy R	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
Ambient temperature range T _a	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
Operating frequency f	≤ 250 Hz	≤ 400 Hz	≤ 400 Hz	≤ 400 Hz	≤ 250 Hz
Utilization categories	AC 140/DC 13	AC 140/DC 13	AC 140/DC 13	AC 140/DC 13	AC 140/DC 13
Function indication	yes	yes	yes	yes	yes
Degree of protection per IEC 529	IP 67	IP 67	IP 67	IP 67	IP 67
Insulation class	II	with protect. GND	with protect. GND	with protect. GND	II
Housing material	nickel plated brass	nickel plated brass	nickel plated brass	nickel plated brass	nickel plated brass
Material of sensing face	PA 12	PA 12	PA 12	PA 12	PA 12
Connection	cable	connector	connector	connector	cable
No. of wires x gauge	2 x 22 AWG				2 x 22 AWG
Approvals	cULus	cULus	cULus	cULus	cULus
Recommended connector		C21 AE3-00-VY-150F		C05 AE1-00-VY-150F	

Please specify the cable length for sensors with molded **cable**.
03, 05 = PVC, length 3 m or 5 m
PU-03, PU-05 = PuFlex, length 3 m or 5 m

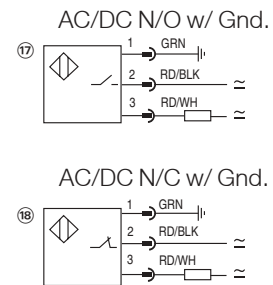
Rated operational current must be derated for temperature



Cable version



Connector version

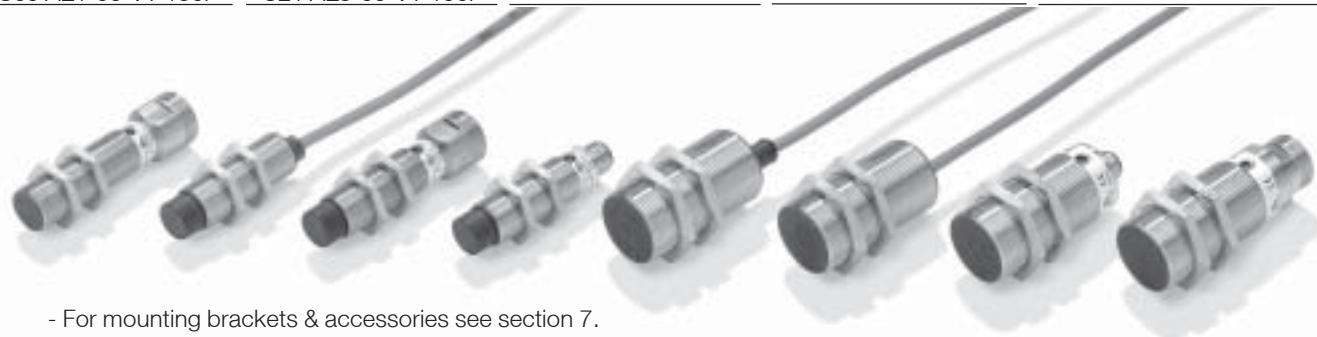


AC/DC 2-Wire

Inductive Sensors

AC/DC 2-Wire
M18, M30
S_n 8, 10, 16 mm

M18x1 non-flush 8 mm 0...6.4 mm	M18x1 non-flush 8 mm 0...6.4 mm	M18x1 non-flush 16 mm 0...13.0 mm	M18x1 non-flush 16 mm 0...13.0 mm	M30x1.5 flush 10 mm 0...8.1 mm
BES 516-213-E5-E-S5 BES 516-214-E5-E-S5	BES 516-213-E5-E-S21 BES 516-214-E5-E-S21	BES 516-213-G-E4-E-	BES 516-213-G-E5-E-S21	BES 516-215-E6-E-
110 Vac 20...250 Vdc/Vac ≤ 11.0 V; ≤ 7.5 V dyn.	110 Vac 20...250 Vdc/Vac ≤ 11.0 V; ≤ 7.5 V dyn.	110 Vac 20...250 Vdc/Vac ≤ 11.0 V; ≤ 7.5 V dyn.	110 Vac 20...250 Vdc/Vac ≤ 11.0 V; ≤ 7.5 V dyn.	110 Vac 20...250 Vdc/Vac ≤ 11.0 V; ≤ 7.5 V dyn.
250 Vac 250 mA 5 mA ≤ 1.7 mA at 110 Vac 1.5 A/max. 1 Hz yes yes	250 Vac 250 mA 5 mA ≤ 1.7 mA at 110 Vac 1.5 A/max. 1 Hz yes yes	250 Vac 250 mA ≤ 5 mA ≤ 1.7 mA at 110 Vac 1.5 A/max. 1.0 Hz yes yes	250 Vac 250 mA ≤ 5 mA ≤ 1.7 mA at 110 Vac 1.5 A/max. 1.0 Hz yes yes	250 Vac 250 mA 5 mA ≤ 1.7 mA at 110 Vac 3 A/max. 1 Hz yes yes
≤ 5 % -25...+70 °C ≤ 250 Hz AC 140/DC 13 yes	≤ 5 % -25...+70 °C ≤ 250 Hz AC 140/DC 13 yes	≤ 5 % -25...+70 °C ≤ 100 Hz AC 140/DC 13 yes	≤ 5 % -25...+70 °C ≤ 100 Hz AC 140/DC 13 yes	≤ 10 % -25...+70 °C ≤ 150 Hz AC 140/DC 13 yes
IP 67 with protect. GND nickel plated brass PA 12 connector	IP 67 with protect. GND nickel plated brass PA 12 connector	IP 67 ⊠ nickel plated brass PBTP cable 2 x 22 AWG cULus	IP 67 with protect. GND nickel plated brass PBTP connector cULus	IP 67 ⊠ nickel plated brass PA 12 cable 2 x 22 AWG cULus
C05 AE1-00-VY-150F	C21 AE3-00-VY-150F	C21 AE3-00-VY-150F	C21 AE3-00-VY-150F	



- For mounting brackets & accessories see section 7.
- For mating connectors see section 6.

Inductive

1

Contents

Selection

Charts

Part

Numbers

Standard

DC 3-/4-Wire

Tubular

DC 3-/4-Wire

Block

AC 2-Wire

Tubular

AC/DC 2-Wire

Tubular

AC/DC 2-Wire

Block

DC 2-Wire

Tubular

Specialty

Welding Sensors

- Factor 1

- Weld Immune

Proximax®

SteelFace™

Proinox®

High Temp

Ultralinear™

Namur

Large

Housing

Ring

Sensors

6

Connectors

7

Accessories

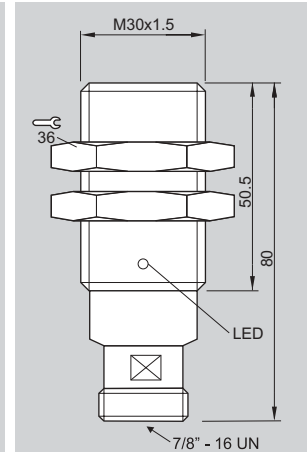
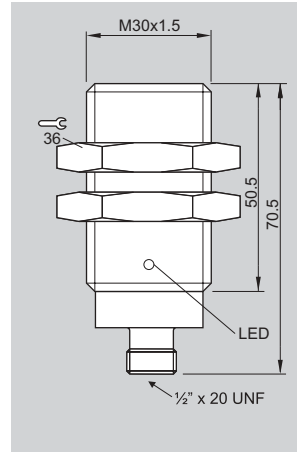
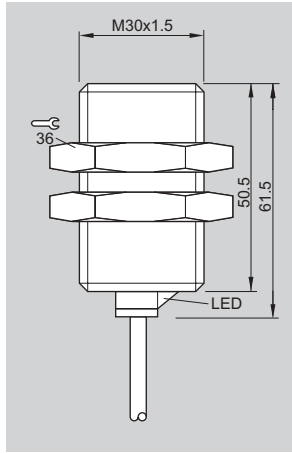
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Technical Reference

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Part Number Index

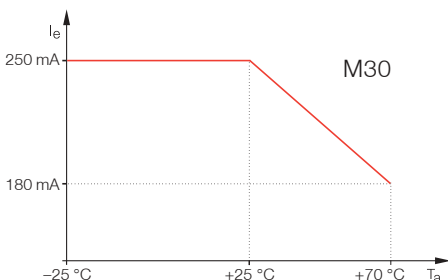
Housing size	M30x1.5	M30x1.5	M30x1.5
Mounting	flush	flush	flush
Rated operating distance s _n	10 mm	10 mm	10 mm
Assured operating distance s _a	0...8.1 mm	0...8.1 mm	0...8.1 mm



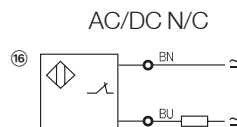
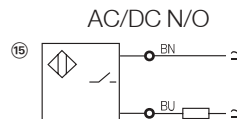
AC/DC	Normally-open ⑮ ⑰	BES 516-215-E4-E-	BES 516-215-E5-E-S21	BES 516-215-E5-E-S5
AC/DC	Normally-closed ⑯ ⑱	BES 516-216-E4-E-	BES 516-216-E5-E-S21	BES 516-216-E5-E-S5
Rated operational voltage U _e	110 Vac	110 Vac	110 Vac	110 Vac
Supply voltage U _B	20...250 Vdc/Vac	20...250 Vdc/Vac	20...250 Vdc/Vac	20...250 Vdc/Vac
Voltage drop U _d at I _e	≤ 11.0 V; ≤ 7.5 V dyn.	≤ 11.0 V; ≤ 7.5 V dyn.	≤ 11.0 V; ≤ 7.5 V dyn.	≤ 11.0 V; ≤ 7.5 V dyn.
Rated insulation voltage U _i	250 Vac	250 Vac	250 Vac	250 Vac
Rated operational current I _e	250 mA	250 mA	250 mA	250 mA
Minimum operational current I _m	5 mA	5 mA	5 mA	5 mA
Off-state current I _r	≤ 1.7 mA at 110 Vac	≤ 1.7 mA at 110 Vac	≤ 1.7 mA at 110 Vac	≤ 1.7 mA at 110 Vac
Inrush current I _k t = 20 ms	2 A/max. 1 Hz	2 A/max. 1 Hz	2 A/max. 1 Hz	2 A/max. 1 Hz
Protected against polarity reversal	yes	yes	yes	yes
Short circuit protected	yes	yes	yes	yes
Repeat accuracy R	≤ 10 %	≤ 10 %	≤ 10 %	≤ 10 %
Ambient temperature range T _a	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
Operating frequency f	≤ 150 Hz	≤ 150 Hz	≤ 150 Hz	≤ 150 Hz
Utilization categories	AC 140/DC 13	AC 140/DC 13	AC 140/DC 13	AC 140/DC 13
Function indication	yes	yes	yes	yes
Degree of protection per IEC 529	IP 67	IP 67	IP 67	IP 67
Insulation class	□	with protect. GND	with protect. GND	with protect. GND
Housing material	nickel plated brass	nickel plated brass	nickel plated brass	nickel plated brass
Material of sensing face	PA 12	PA 12	PA 12	PA 12
Connection	cable	connector	connector	connector
No. of wires x gauge	2 x 22 AWG			
Approvals	cULus	cULus	cULus	cULus
Recommended connector		C21 AE3-00-VY-150F		C05 AE1-00-VY-150F

Please specify the cable length for sensors with molded **cable**.
03, 05 = PVC, length 3 m or 5 m
PU-03, PU-05 = PuFlex, length 3 m or 5 m

Rated operational current must be derated for temperature



Cable version



Connector version

