

DC 2-Wire Tubular

**Inductive Proximity
Sensors**

**DC 2 Wire
Tubular Sensors**

Our 2 wire DC tubular product line includes sensors that range in size from M8 to M30 to meet a range of application needs.

These sensors are available in flush and non-flush housings. M12, M18, and M30 versions are also available with Teflon coatings.

- 1.80** M8
- 1.81** M8, M12
- 1.82** M12
- 1.83** M18
- 1.84** M18, M30
- 1.85** M30
- 1.86** M30

GlobalProx

General Purpose Proximity Sensors

Balluff manufactures over 2,000 proximity sensors, many designed with specific applications in mind. With so many choices it can be difficult to select the appropriate sensor solution. However, most applications are not that specialized and may only require a general-purpose solution.

With the introduction of the GlobalProx family of proximity sensors, Balluff makes selecting a proximity sensor a whole lot easier. Balluff GlobalProx sensors were designed to meet the needs of general-purpose applications found in North America as well as the rest of the world.

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

**DC2-Wire
Tubular**

Specialty

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

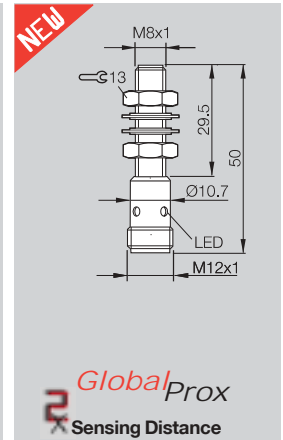
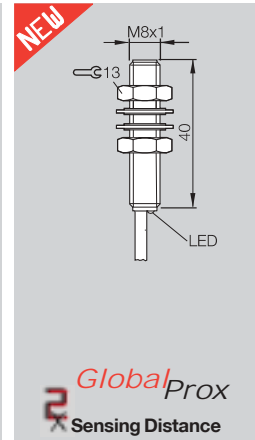
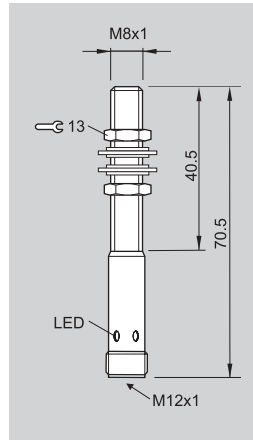
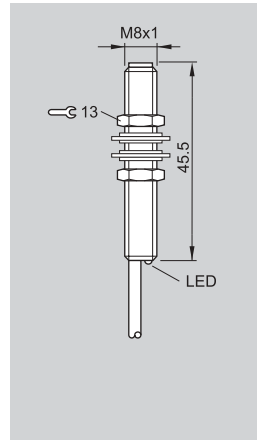
6 Connectors

7 Accessories

t Technical
Reference

p Part
Number
Index

Housing size	M8x1	M8x1	M8x1	M8x1
Mounting	flush	flush	flush	flush
Rated operating distance s _n	1.5 mm	1.5 mm	2 mm	2 mm
Assured operating distance s _a	0...1.2 mm	0...1.2 mm	0...1.6 mm	0...1.6 mm



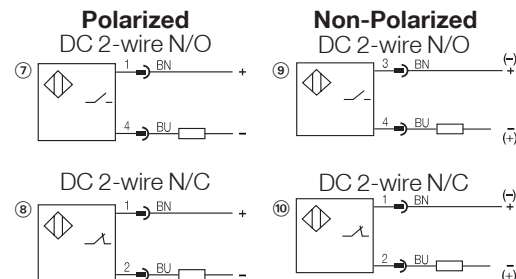
DC 2-wire	Normally-open ⑦⑨	BES 516-526-E0-H-	BES 516-526-S4-H	BES M08MG-USC20B-	BES M08ME1-USC20B-S04G
DC 2-wire	Normally-closed ⑧⑩	BES 516-527-E0-H-	BES 516-527-S4-H		

Rated operational voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Supply voltage U _B	10...55 Vdc	10...55 Vdc	10...30 Vdc	10...30 Vdc
Polarity	Non-polarized	Non-polarized	Non-polarized	Non-polarized
Voltage drop U _d at I _e	≤ 5.0 V	≤ 5.0 V	≤ 5.0 V	≤ 5.0 V
Rated insulation voltage U _i	75 Vdc	75 Vdc	75 Vdc	75 Vdc
Rated operational current I _e	130 mA	130 mA	100 mA	100 mA
Minimum operational current I _m	5 mA	5 mA	5 mA	5 mA
Off-state current I _r	≤ 500 μA	≤ 500 μA	≤ 600 μA	≤ 600 μA
Protected against polarity reversal	yes	yes	yes	yes
Short circuit protected	yes	yes	yes	yes
Load capacitance	≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF
Repeat accuracy R	≤ 5%	≤ 5%	≤ 5%	≤ 5%
Ambient temperature range T _a	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
Operating frequency f	3000 Hz	3000 Hz	1500 Hz	1500 Hz
Utilization categories	DC 13	DC 13	DC 13	DC 13
Function indication	yes	yes	yes	yes

Degree of protection per IEC 529	IP 67	IP 67	IP 67	IP 67
Insulation class				
Housing material	stainless steel	stainless steel	nickel free brass	nickel free brass
Material of sensing face	PBTP	PBTP	PBT	PBT
Connection	cable	connector	cable	connector
No. of wires x gauge	2 x 26 AWG		2 x 26 AWG	
Approvals	cULus	cULus		
Recommended connector N/O		C04 AEA-00-TY-050M		C04 AEA-00-TY-050M
Recommended connector N/C		C04 AEB-00-TY-050M		

See technical section for proper mounting of the 2x, 3x, and 4x long range sensors.

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

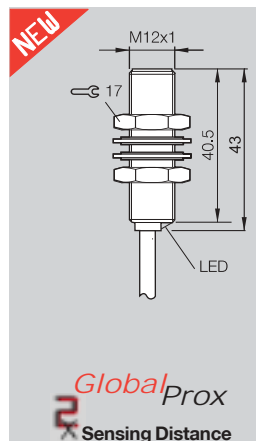
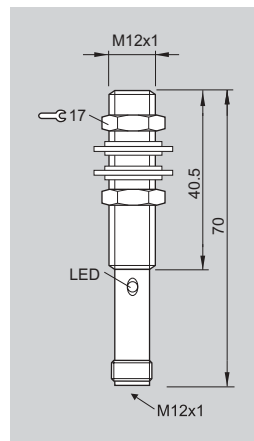
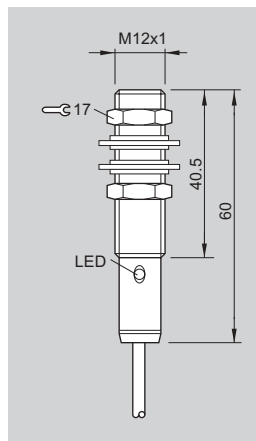
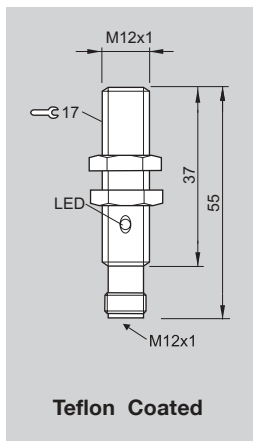
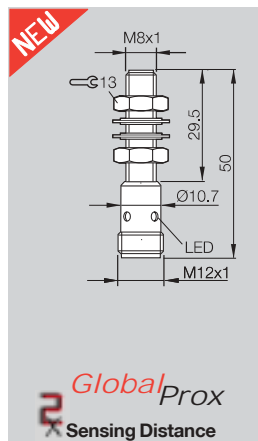


DC 2-Wire

Inductive Sensors

DC 2-Wire
M8, M12
S_n 2 mm, 3 mm

M8x1	M12x1	M12x1	M12x1	M12x1
flush	flush	flush	flush	flush
2 mm	2 mm	2 mm	2 mm	3 mm
0...1.6 mm	0...1.6 mm	0...1.6 mm	0...1.6 mm	0...2.4 mm



BES M08ME1-GSC20B-S04G	BES BC5T-1202-D-US	BES 516-542-B0-H- BES 516-543-B0-H-	BES 516-542-S4-H BES 516-543-S4-H	BES M12MG-USC30B-
24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc
10...30 Vdc	10...30 Vdc	10...55 Vdc	10...55 Vdc	10...30 Vdc
Polarized	Non-polarized	Non-polarized	Non-polarized	Non-polarized
≤ 4.0 V	≤ 3.5 V	≤ 5.0 V	≤ 5.0 V	≤ 5.0 V
75 Vdc	75 Vdc	250 Vac	250 Vac	75 Vdc
100 mA	100 mA	200 mA	200 mA	100 mA
5 mA	4 mA	5 mA	5 mA	5 mA
≤ 600 µA		≤ 500 µA	≤ 500 µA	≤ 600 µA
yes	no	yes	yes	yes
yes	yes	yes	yes	yes
≤ 1.0 µF	≤ 1.0 µF	≤ 1.0 µF	≤ 1.0 µF	≤ 1.0 µF
≤ 5%	≤ 5%	≤ 5%	≤ 5%	≤ 5%
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
1500 Hz	≤ 800 Hz	2500 Hz	2500 Hz	1300 Hz
DC 13	DC 13	DC 13	DC 13	DC 13
yes	yes	yes	yes	yes
		□	□	
IP 67	IP 67	IP 68	IP 68	IP 67
nickel free brass	teflon coated brass	stainless steel	stainless steel	nickel free brass
PBT	PTFE	PA 12	PA 12	PA 12
connector	connector	cable	connector	cable
		2 x 22 AWG		2 x 22 AWG
cULus		cULus	cULus	
BKS-S19-13-03	C04 AEA-00-TY-050M		C04 AEA-00-TY-050M C04 AEB-00-TY-050M	



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

Inductive

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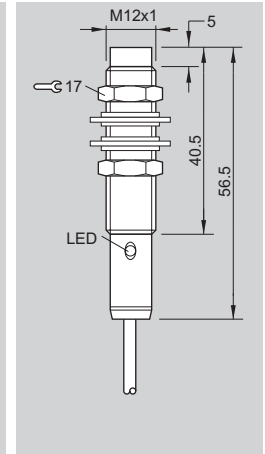
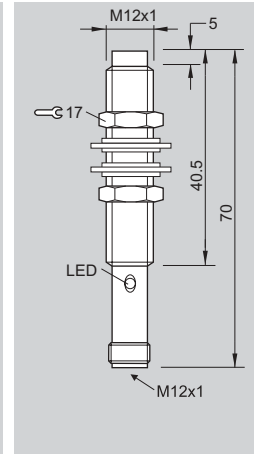
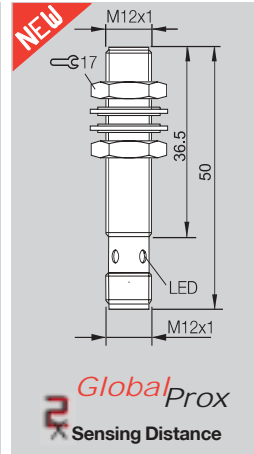
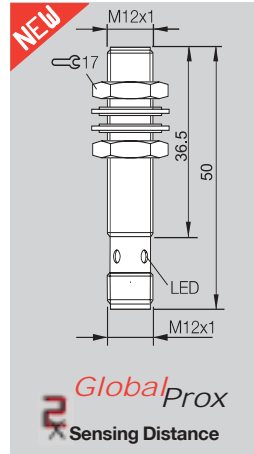
- Contents
- Selection Charts
- Part Numbers
- Standard
- DC 3-/4-Wire Tubular
- DC 3-/4-Wire Block
- AC 2-Wire Tubular
- AC/DC 2-Wire Tubular
- AC/DC 2-Wire Block
- DC2-Wire Tubular**
- Specialty
- Welding Sensors – Factor 1 – Weld Immune
- Proximax®
- SteelFace™
- Proxinox®
- High Temp
- Ultralinear™
- Namur
- Large Housing
- Ring Sensors
- 6 Connectors
- 7 Accessories
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- p Part Number Index

Inductive Sensors

DC 2-Wire
M12
S_n 3 mm, 4 mm

DC 2-Wire

Housing size	M12x1	M12x1	M12x1	M12x1
Mounting	flush	flush	non-flush	non-flush
Rated operating distance s _n	3 mm	3 mm	4 mm	4 mm
Assured operating distance s _a	0...2.4 mm	0...2.4 mm	0...3.2 mm	0...3.2 mm

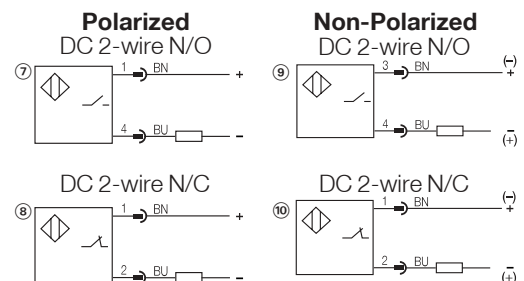


DC 2-wire	Normally-open ⑦⑨	BESM12MF-USC30B-S04G	BESM12MF-GSC30B-S04G	BES 516-544-S4-H	BES 516-544-B0-H
DC 2-wire	Normally-closed ⑧⑩			BES 516-545-S4-H	BES 516-545-B0-H
Rated operational voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Supply voltage U _B	10...30 Vdc	10...30 Vdc	10...30 Vdc	10...55 Vdc	10...55 Vdc
Polarity	Non-polarized	Polarized	Non-polarized	Non-polarized	Non-polarized
Voltage drop U _d at I _e	≤ 5.0 V	≤ 4.0 V	≤ 5.0 V	≤ 5.0 V	≤ 5.0 V
Rated insulation voltage U _i	75 Vdc	75 Vdc	250 Vac	250 Vac	250 Vac
Rated operational current I _e	100 mA	100 mA	200 mA	200 mA	200 mA
Minimum operational current I _m	5 mA	5 mA	5 mA	5 mA	5 mA
Off-state current I _r	≤ 600 μA	≤ 600 μA	≤ 500 μA	≤ 500 μA	≤ 500 μA
Protected against polarity reversal	yes	yes	yes	yes	yes
Short circuit protected	yes	yes	yes	yes	yes
Load capacitance	≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF
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	1300 Hz	1300 Hz	1000 Hz	1000 Hz	1000 Hz
Utilization categories	DC 13	DC 13	DC 13	DC 13	DC 13
Function indication	yes	yes	yes	yes	yes
Degree of protection per IEC 529	IP 67	IP 67	IP 68	IP 68	IP 68
Insulation class					
Housing material	nickel free brass	nickel free brass	stainless steel	stainless steel	stainless steel
Material of sensing face	PA 12	PA 12	PA 12	PA 12	PA 12
Connection	connector	connector	connector	connector	cable
No. of wires x gauge					2 x 22 AWG
Approvals		cULus	cULus	cULus	cULus
Recommended connector N/O	C04 AEA-00-TY-050M	BKS-S19-13-03	C04 AEA-00-TY-050M	C04 AEA-00-TY-050M	
Recommended connector N/C			C04 AEB-00-TY-050M	C04 AEB-00-TY-050M	

See technical section for proper mounting of the 2x, 3x, and 4x long range sensors.

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

Please specify the cable length for sensors with **cable and connector**.
BP00.2, BP00.5 = PUR, length 0.2 m or 0.5 m



DC 2-Wire

Inductive Sensors

DC 2-Wire
M18
S_n 5 mm, 7 mm

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

DC2-Wire Tubular

Specialty

Welding Sensors
– Factor 1
– Weld Immune
Proximax®
SteelFace™
Proxinox®
High Temp
Ultralinear™

Namur

Large Housing

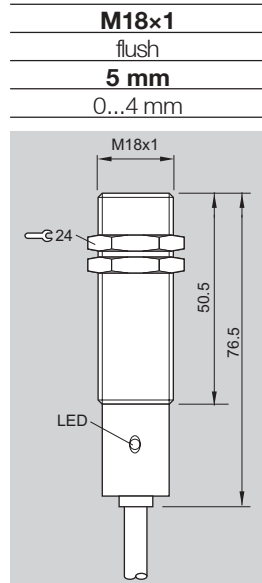
Ring Sensors

6 Connectors

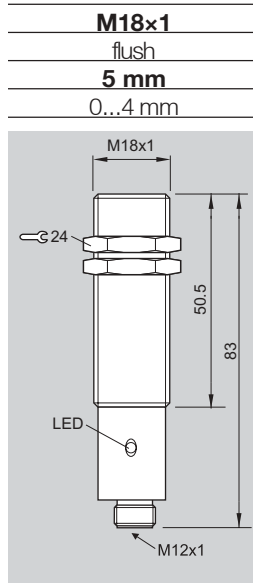
7 Accessories

t Technical Reference

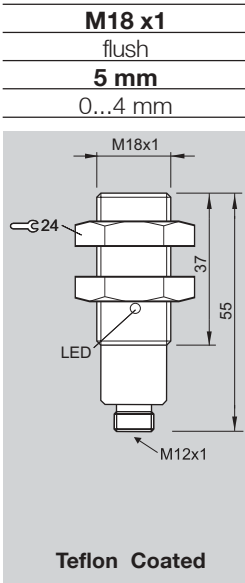
p Part Number Index



BES 516-538-B0-H-

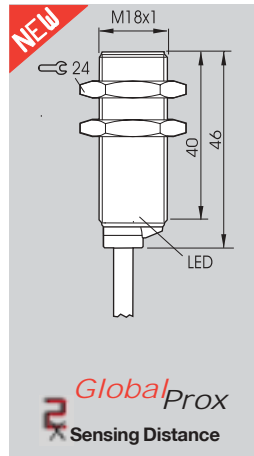


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BES 516-539-S4-H



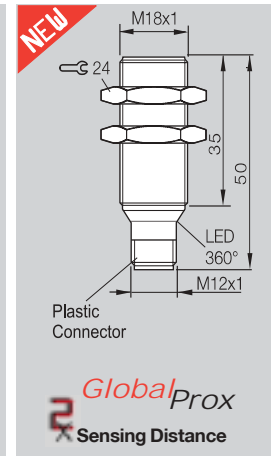
Teflon Coated

BES BC5T-1805-D-US



GlobalProx
Sensing Distance

BES M18MG-USC70B-



GlobalProx
Sensing Distance

BES M18MF-USC70B-S04K

24 Vdc
10...55 Vdc
Non-polarized
≤ 5.0 V
250 Vac
200 mA
5 mA
≤ 500 µA
yes
yes
≤ 1.0 µF
≤ 5 %
-25...+70 °C
250 Hz
DC 13
yes
IP 68
nickel plated brass
PA 12
cable
2 x 22 AWG
cULus

24 Vdc
10...55 Vdc
Non-polarized
≤ 5.0 V
250 Vac
200 mA
5 mA
≤ 500 µA
yes
yes
≤ 1.0 µF
≤ 5 %
-25...+70 °C
250 Hz
DC 13
yes
IP 68
nickel plated brass
PA 12
connector
cULus
C04 AEA-00-TY-050M
C04 AEB-00-TY-050M

24 Vdc
10...30 Vdc
Non-polarized
≤ 3.5 V
75 Vdc
100 mA
4 mA
no
yes
≤ 1.0 µF
≤ 5%
-25...+70 °C
500 Hz
DC 13
yes
IP 67
teflon coated brass
PTFE
connector
C04 AEA-00-TY-050M

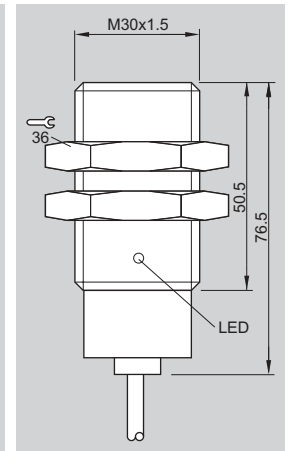
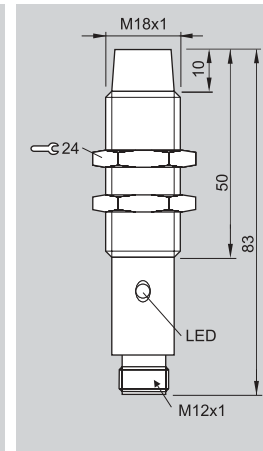
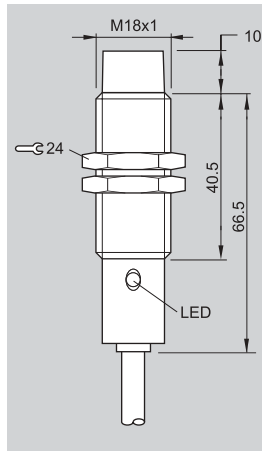
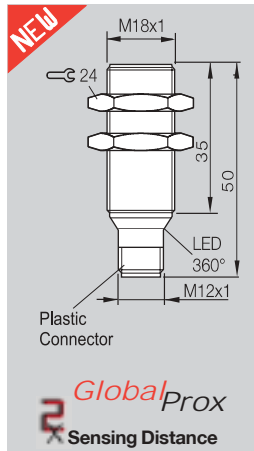
24 Vdc
10...30 Vdc
Non-polarized
≤ 5.0 V
75 Vdc
100 mA
5 mA
≤ 600 µA
yes
yes
≤ 1.0 µF
≤ 5%
-25...+70 °C
600 Hz
DC 13
yes
IP 67
nickel free brass
PBT
cable
2 x 22 AWG

24 Vdc
10...30 Vdc
Non-polarized
≤ 5.0 V
75 Vdc
100 mA
5 mA
≤ 600 µA
yes
yes
≤ 1.0 µF
≤ 5%
-25...+70 °C
600 Hz
DC 13
yes
IP 67
nickel free brass
PBT
connector
C04 AEA-00-TY-050M



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

Housing size	M18x1	M18x1	M18x1	M30x1.5
Mounting	flush	non-flush	non-flush	flush
Rated operating distance s _n	7 mm	8 mm	8 mm	10 mm
Assured operating distance s _a	0...5.7 mm	0...6.5 mm	0...6.5 mm	0...8.1 mm

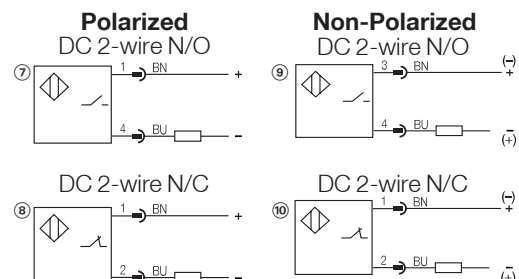


DC 2-wire Normally-open ⑦⑨	BESM18MF-GSC70B-S04K	BES 516-546-B0-H-	BES 516-546-S 4-H	BES 516-540-B0-H-
DC 2-wire Normally-closed ⑧⑩			BES 516-547-S 4-H	BES 516-541-B0-H-
Rated operational voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Supply voltage U _B	10...30 Vdc	10...55 Vdc	10...55 Vdc	10...55 Vdc
Polarity	Polarized	Non-polarized	Non-polarized	Non-polarized
Voltage drop U _d at I _e	≤ 4.0 V	≤ 5.0 V	≤ 5.0 V	≤ 5.0 V
Rated insulation voltage U _i	75 Vdc	250 Vac	250 Vac	250 Vac
Rated operational current I _e	100 mA	200 mA	200 mA	200 mA
Minimum operational current I _m	5 mA	5 mA	5 mA	5 mA
Off-state current I _r	≤ 600 μA	≤ 500 μA	≤ 500 μA	≤ 500 μA
Protected against polarity reversal	yes	yes	yes	yes
Short circuit protected	yes	yes	yes	yes
Load capacitance	≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF
Repeat accuracy R	≤ 5%	≤ 5 %	≤ 5 %	≤ 5 %
Ambient temperature range T _a	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
Operating frequency f	600 Hz	200 Hz	200 Hz	150 Hz
Utilization categories	DC 13	DC 13	DC 13	DC 13
Function indication	yes	yes	yes	yes
Degree of protection per IEC 529	IP 67	IP 68	IP 68	IP 68
Insulation class		□	□	□
Housing material	nickel free brass	nickel plated brass	nickel plated brass	nickel plated brass
Material of sensing face	PBT	PA 12	PA 12	PA 12
Connection	connector	cable	connector	cable
No. of wires x gauge		2 × 22 AWG		2 × 22 AWG
Approvals	cULus	cULus	cULus	cULus
Recommended connector N/O	BKS-S19-13-03		C04 AEA-00-TY-050M	
Recommended connector N/C			C04 AEB-00-TY-050M	

See technical section for proper mounting of the 2x, 3x, and 4x long range sensors.

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

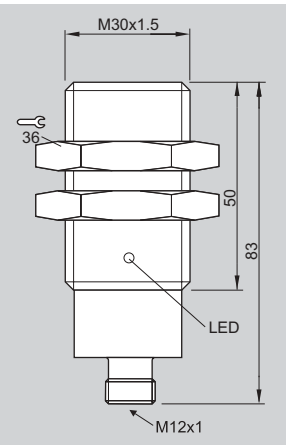
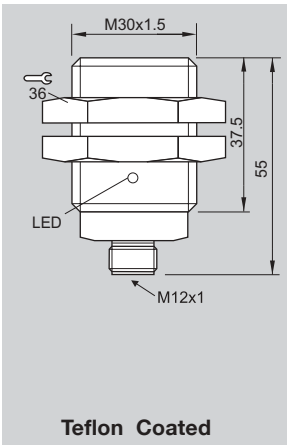
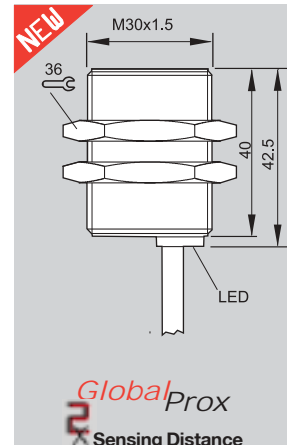
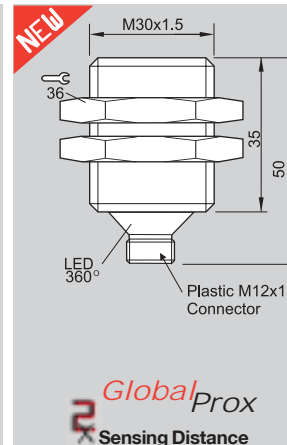
Ⓔ Please specify the cable length for sensors with **cable and connector**.
BP00.2, BP00.5 = PUR, length 0.2 m or 0.5 m



DC 2-Wire

Inductive Sensors

DC 2-Wire
M30
S_n 10 mm, 15 mm

M30x1.5 flush 10 mm 0...8.1 mm	M30x1.5 flush 10 mm 0...8.1 mm	M30x1.5 flush 15 mm 0...12.2 mm	M30x1.5 flush 15 mm 0...12.2 mm
			
BES 516-540-S4-H BES 516-541-S4-H	BES BC5T-3010-D-US	BES M30MF-USC15B-	BES M30MF-USC15B-S04K
24 Vdc 10...55 Vdc Non-polarized ≤ 5.0 V 250 Vac 200 mA 5 mA ≤ 500 µA yes yes ≤ 1.0 µF	24 Vdc 10...30 Vdc Non-polarized ≤ 3.5 V 75 Vdc 100 mA 4 mA ≤ 500 µA no yes ≤ 1.0 µF	24 Vdc 10...30 Vdc Non-polarized ≤ 5.0 V 75 Vdc 100 mA 5 mA ≤ 600 µA yes yes ≤ 1.0 µF	24 Vdc 10...30 Vdc Non-polarized ≤ 5.0 V 75 Vdc 100 mA 5 mA ≤ 600 µA yes yes ≤ 1.0 µF
≤ 5 % -25...+70 °C 150 Hz DC 13 yes ☐ IP 68	≤ 5 % -25...+70 °C 300 Hz DC 13 yes IP 67	≤ 5 % -25...+70 °C 400 Hz DC 13 yes IP 67	≤ 5 % -25...+70 °C 400 Hz DC 13 yes IP 67
nickel plated brass PA 12 connector	teflon coated brass PTFE connector	nickel free brass PA 12 cable 2 x 22 AWG cULus	nickel free brass PA 12 connector cULus
C04 AEA-00-TY-050M C04 AEB-00-TY-050M	C04 AEA-00-TY-050M	cULus	C04 AEA-00-TY-050M



- 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

DC2-Wire Tubular

Specialty

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

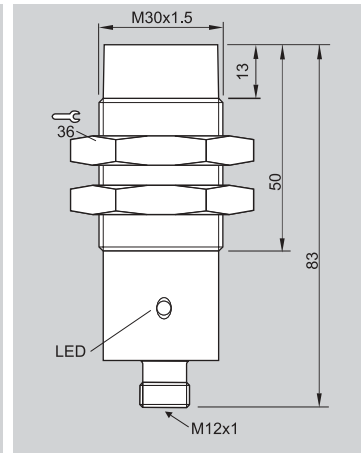
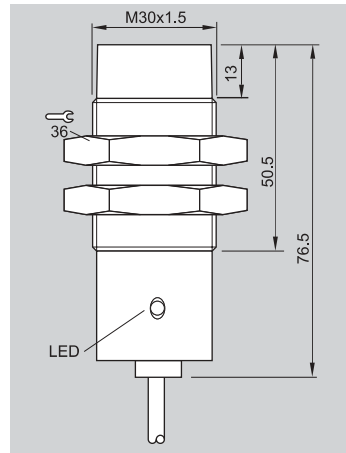
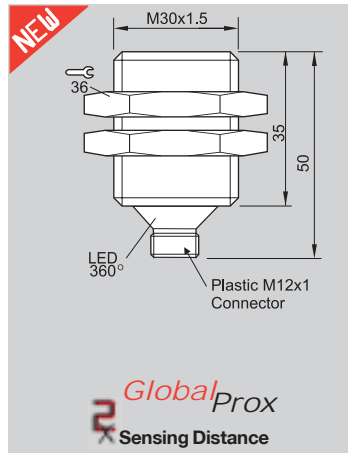
6 Connectors

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Housing size	M30x1.5	M30x1.5	M30x1.5
Mounting	flush	non-flush	non-flush
Rated operating distance s _n	15 mm	15 mm	15 mm
Assured operating distance s _a	0...12.2 mm	0...12 mm	0...12 mm



DC 2-wire Normally-open ⑦⑨	BES M30MF-GSC15B-S04K	BES 516-548-B0-H-	BES 516-548-S4-H
DC 2-wire Normally-closed ⑧⑩			BES 516-549-S4-H
Rated operational voltage U _e	24 Vdc	24 Vdc	24 Vdc
Supply voltage U _B	10...30 Vdc	10...55 Vdc	10...55 Vdc
Polarity	Polarized	Non-polarized	Non-polarized
Voltage drop U _d at I _e	≤ 4.0 V	≤ 5.0 V	≤ 5.0 V
Rated insulation voltage U _i	75 Vdc	250 Vac	250 Vac
Rated operational current I _e	100 mA	200 mA	200 mA
Minimum operational current I _m	5 mA	5 mA	5 mA
Off-state current I _r	≤ 600 μA	≤ 500 μA	≤ 500 μA
Protected against polarity reversal	yes	yes	yes
Short circuit protected	yes	yes	yes
Load capacitance	≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF
Repeat accuracy R	≤ 5%	≤ 5 %	≤ 5 %
Ambient temperature range T _a	-25...+70 °C	-25...+70 °C	-25...+70 °C
Operating frequency f	400 Hz	100 Hz	100 Hz
Utilization categories	DC 13	DC 13	DC 13
Function indication	yes	yes	yes
Degree of protection per IEC 529	IP 67	IP 68	IP 68
Insulation class		□	□
Housing material	nickel free brass	nickel plated brass	nickel plated brass
Material of sensing face	PA 12	PA 12	PA 12
Connection	connector	cable	connector
No. of wires x gauge		2 × 22 AWG	
Approvals	cULus	cULus	cULus
Recommended connector N/O	BKS-S19-13-03		C04 AEA-00-TY-050M
Recommended connector N/C			C04 AEB-00-TY-050M

See technical section for proper mounting of the 2x, 3x, and 4x long range sensors.

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

