

**Inductive
Proximity Switches**

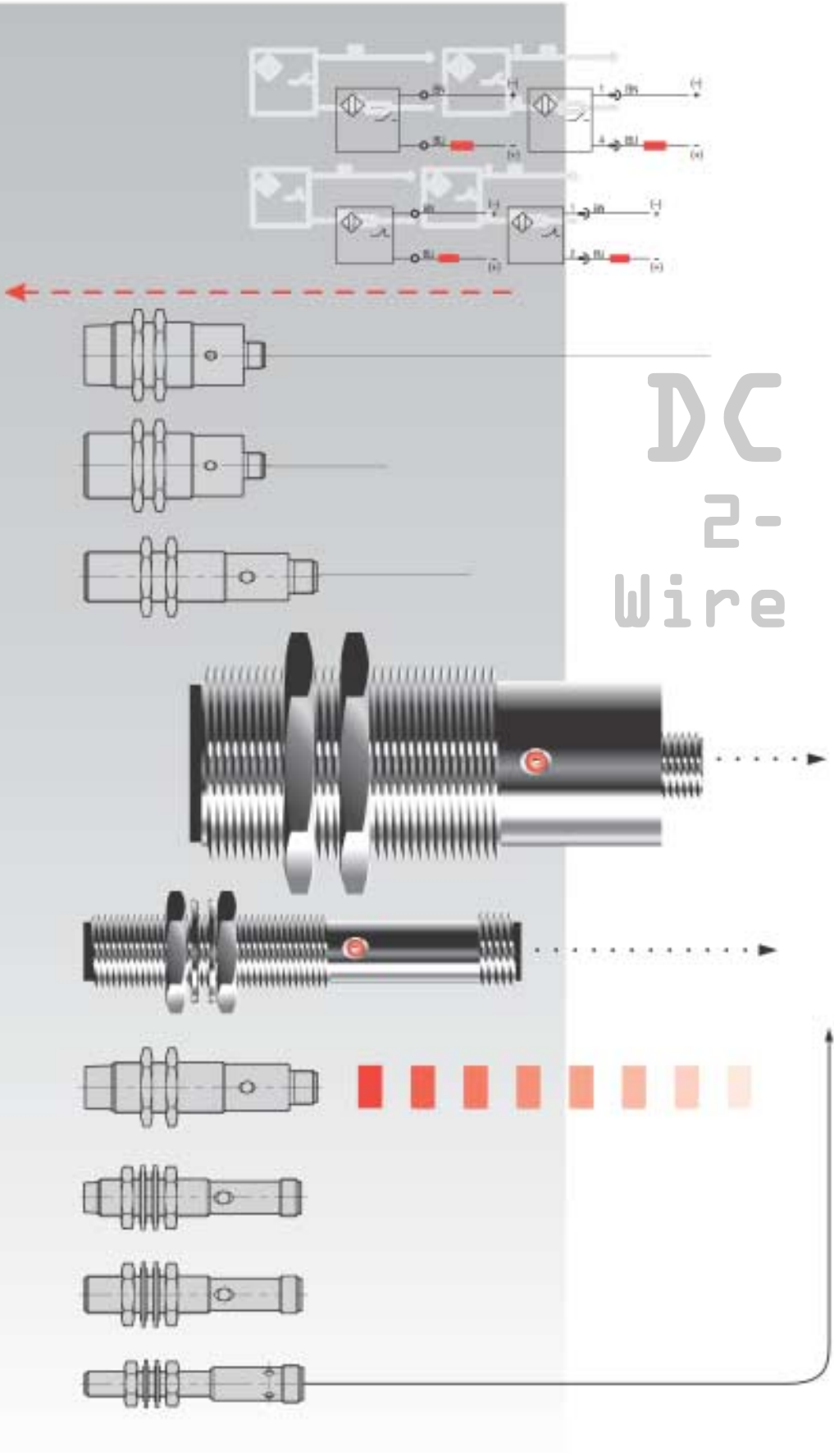
**Our Standard
Offering in 2-Wire
DC Versions**

With this broad range of product, Balluff offers proximity switches in housings from M8 to M30 for virtually any application in the field of automation.

The easy handling of these sensors is increased by the addition of an optical setup aid.

**DC
2-Wire Sensors**

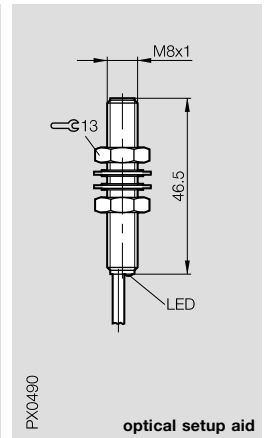
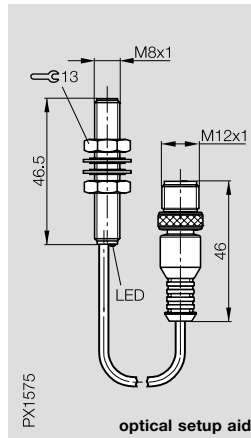
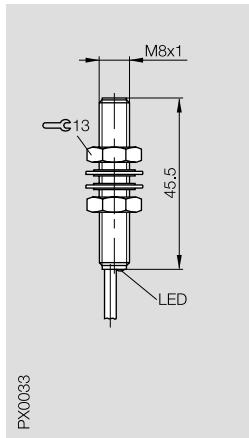
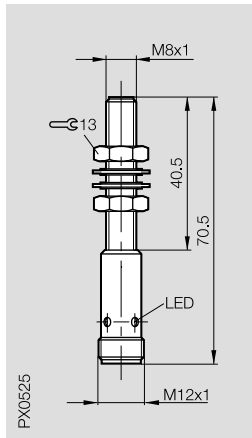
- 1.3.2** M8
- 1.3.3** M12
- 1.3.4** M12, M18
- 1.3.5** M18
- 1.3.6** M30



Inductive Sensors

DC 2-Wire
M8
s_n 1.5 mm, 2 mm

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



Normally-open ⑨ ⑦	BES 516-526-S 4-H	BES 516-526-E0-H-	BES M08EH-GSC20B-___-GS04	BES M08EH-GSC20B-
Normally-closed ⑩	BES 516-527-S 4-H	BES 516-527-E0-H-		
Rated operational voltage U _e	24 V DC	24 V DC	24 V DC	24 V DC
Supply voltage U _B	10...55 V DC	10...55 V DC	10...30 V DC polarized	10...30 V DC polarized
Voltage drop U _d at I _e	≤ 5 V	≤ 5 V	≤ 4.7 V	≤ 4.7 V
Rated insulation voltage U _i	75 V DC	75 V DC	75 V DC	250 V AC
Rated operational current I _e	130 mA	130 mA	100 mA	100 mA
Minimum operational current I _m	5 mA	5 mA	3 mA	3 mA
Off-state current I _r	≤ 500 μA	≤ 500 μA	≤ 650 μA	≤ 650 μA
Protected against polarity reversal	yes	yes	yes	yes
Short circuit protected	yes	yes	yes	yes
Load capacity	≤ 1 μF	≤ 1 μF	≤ 0.2 μF	≤ 0.2 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
Frequency of operating cycles f	3000 Hz	3000 Hz	1000 Hz	1000 Hz
Utilization categories	DC 13	DC 13	DC 13	DC 13
Function indication	yes	yes	yes	yes
Degree of protection per IEC 60529	IP 67	IP 67	IP 67	IP 67
Insulation class				□
Housing material	stainless steel	stainless steel	stainless steel	stainless steel
Material of sensing face	PBT	PBT	PBT	PBT
Connection	connector	cable	cable with connector	cable
No. of wires x conductor cross section		2 x 0.14 mm ²		2 x 0.34 mm ²
Approval	cULus	cULus		
Recommended connector	BKS-B 19-11/-B 20-11/ BKS-B 19-12/-B 20-12		BKS-B 19-13	

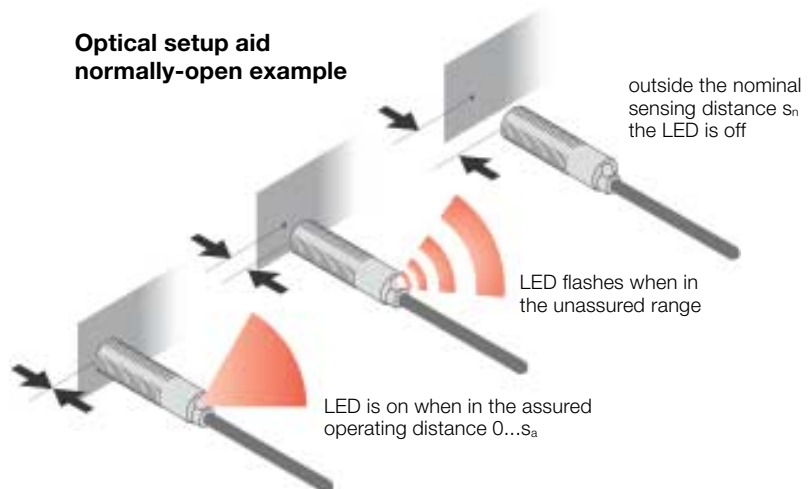
⑨ Connection diagrams see page 1.0.12

Please add the cable length to the ordering code for sensors with **cable!**

Example: **BES 516-542-B0-H-PU-05**
03, 05 = PVC, length 3 m or 5 m
PU-03, PU-05 = PUR, length 3 m or 5 m
or
Example: **BES M12MK-GSC30B-BP03**
BP03, BP05 = PUR, length 3 m or 5 m

Please add the cable length to the ordering code for sensors with **cable and connector!**
BP00,3, BP00,5 = PUR, length 0,3 m or 0,5 m

Optical setup aid normally-open example



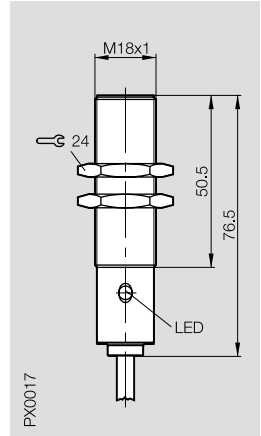
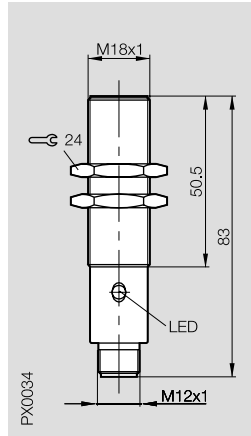
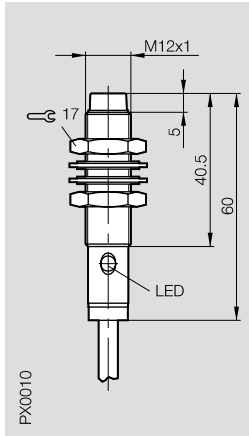
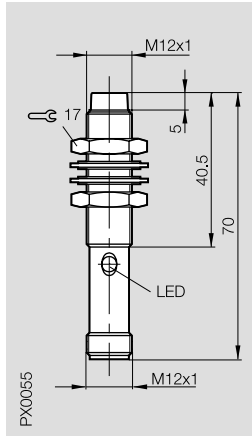
M12x1 flush 2 mm 0...1.6 mm	M12x1 flush 2 mm 0...1.6 mm	M12x1 flush 3 mm 0...2.4 mm	M12x1 flush 3 mm 0...2.4 mm
BES 516-542-S 4-H BES 516-543-S 4-H	BES 516-542-B0-H- BES 516-543-B0-H-	BES M12MK-GSC30B-___-GS04	BES M12MK-GSC30B-
24 V DC	24 V DC	24 V DC	24 V DC
10...55 V DC	10...55 V DC	10...30 V DC polarized	10...30 V DC polarized
≤ 5 V	≤ 5 V	≤ 3 V	≤ 3 V
250 V AC	250 V AC	250 V AC	250 V AC
200 mA	200 mA	100 mA	100 mA
5 mA	5 mA	3 mA	3 mA
≤ 500 μA	≤ 500 μA	≤ 700 μA	≤ 700 μA
yes	yes	yes	yes
yes	yes	yes	yes
≤ 1 μF	≤ 1 μF	≤ 0.2 μF	≤ 0.2 μF
≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
2500 Hz	2500 Hz	1000 Hz	1000 Hz
DC 13	DC 13	DC 13	DC 13
yes	yes	yes	yes
IP 68 per BWN Pr. 20 □	IP 68 per BWN Pr. 20 □	IP 68 per BWN Pr. 20 □	IP 68 per BWN Pr. 20 □
stainless steel	stainless steel	CuZn nickel plated	CuZn nickel plated
PA 12	PA 12	PBT	PBT
connector	cable	cable with connector	cable
cULus	2 × 0.34 mm ² cULus		2 × 0.34 mm ²
BKS-B 19-11/-B 20-11/ BKS-B 19-12/-B 20-12		BKS-B 19-13	



Inductive Sensors

DC 2-Wire
M12, M18
s_n 4 mm, 5 mm

Housing size	M12x1	M12x1	M18x1	M18x1
Mounting	non-flush	non-flush	flush	flush
Rated operating distance s _n	4 mm	4 mm	5 mm	5 mm
Assured operating distance s _a	0...3.2 mm	0...3.2 mm	0...4.1 mm	0...4.1 mm



Normally-open ⑨ ⑦	BES 516-544-S 4-H	BES 516-544-B0-H-	BES 516-538-S 4-H	BES 516-538-B0-H-
Normally-closed ⑩	BES 516-545-S 4-H	BES 516-545-B0-H-	BES 516-539-S 4-H	BES 516-539-B0-H-
Rated operational voltage U _e	24 V DC	24 V DC	24 V DC	24 V DC
Supply voltage U _B	10...55 V DC	10...55 V DC	10...55 V DC	10...55 V DC
Voltage drop U _d at I _e	≤ 5 V	≤ 5 V	≤ 5 V	≤ 5 V
Rated insulation voltage U _i	250 V AC	250 V AC	250 V AC	250 V AC
Rated operational current I _e	200 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	≤ 500 µA	≤ 500 µA	≤ 500 µA	≤ 500 µA
Protected against polarity reversal	yes	yes	yes	yes
Short circuit protected	yes	yes	yes	yes
Load capacity	≤ 1 µF	≤ 1 µF	≤ 1 µF	≤ 1 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
Frequency of operating cycles f	1000 Hz	1000 Hz	250 Hz	250 Hz
Utilization categories	DC 13	DC 13	DC 13	DC 13
Function indication	yes	yes	yes	yes
Degree of protection per IEC 60529	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
Insulation class	□	□	□	□
Housing material	stainless steel	stainless steel	CuZn nickel plated	CuZn nickel plated
Material of sensing face	PA 12	PA 12	PA 12	PA 12
Connection	connector	cable	connector	cable
No. of wires x conductor cross section		2 x 0.34 mm ²		2 x 0.34 mm ²
Approval	cULus	cULus	cULus	cULus
Recommended connector	BKS-B 19-11/-B 20-11/ BKS-B 19-12/-B 20-12		BKS-B 19-11/-B 20-11/ BKS-B 19-12/-B 20-12	

⑨ Connection diagrams see page 1.0.12

Please add the cable length to the ordering code for sensors with **cable!**

Example: **BES 516-546-B0-H-PU-05**
03, 05 = PVC, length 3 m or 5 m
PU-03, PU-05 = PUR, length 3 m or 5 m
or
Example: **BES M18MK-GSC70B-BP03**
BP03, BP05 = PUR, length 3 m or 5 m

Please add the cable length to the ordering code for sensors with **cable and connector!**
BP00,3, BP00,5 = PUR, length 0,3 m or 0,5 m



Inductive Sensors

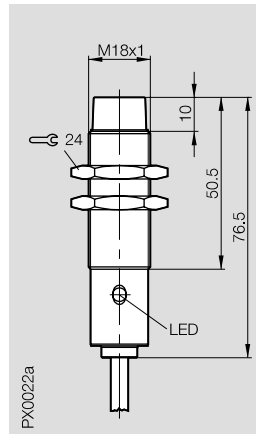
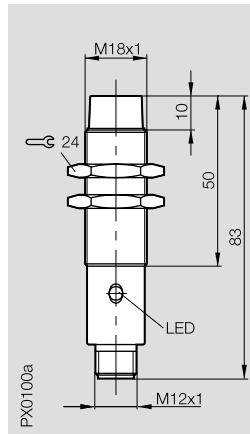
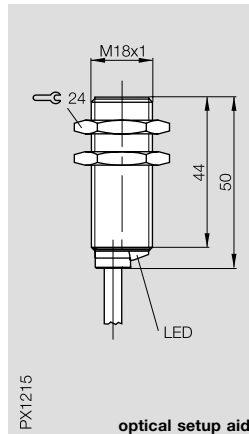
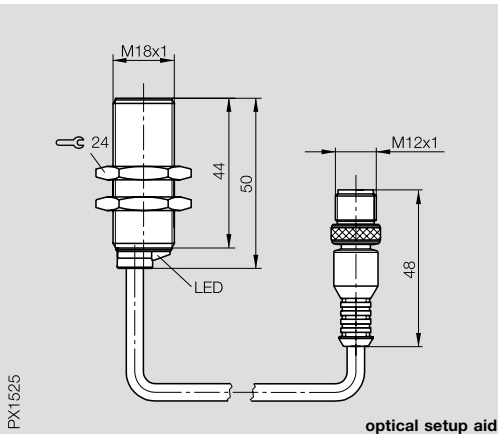
DC 2-Wire
M18
s_n 7 mm, 8 mm

M18x1
flush
7 mm
0...5.7 mm

M18x1
flush
7 mm
0...5.7 mm

M18x1
non-flush
8 mm
0...6.5 mm

M18x1
non-flush
8 mm
0...6.5 mm



BES M18MK-GSC70B-___-GS04

BES M18MK-GSC70B-

BES 516-546-S 4-H
BES 516-547-S 4-H

BES 516-546-B0-H-
BES 516-547-B0-H-

24 V DC
10...30 V DC polarized
≤ 3 V
250 V AC
100 mA
3 mA
≤ 700 μA
yes
yes
≤ 0.2 μF

24 V DC
10...30 V DC polarized
≤ 3 V
250 V AC
100 mA
3 mA
≤ 700 μA
yes
yes
≤ 0.2 μF

24 V DC
10...55 V DC
≤ 5 V
250 V AC
200 mA
5 mA
≤ 500 μA
yes
yes
≤ 1 μF

24 V DC
10...55 V DC
≤ 5 V
250 V AC
200 mA
5 mA
≤ 500 μA
yes
yes
≤ 1 μF

≤ 5 %
-25...+70 °C
500 Hz
DC 13
yes

≤ 5 %
-25...+70 °C
500 Hz
DC 13
yes

≤ 5 %
-25...+70 °C
200 Hz
DC 13
yes

≤ 5 %
-25...+70 °C
200 Hz
DC 13
yes

IP 68 per BWN Pr. 20
☐
CuZn nickel plated
PBT
cable with connector

IP 68 per BWN Pr. 20
☐
CuZn nickel plated
PBT
cable
2 × 0.34 mm²

IP 68 per BWN Pr. 20
☐
CuZn nickel plated
PA 12
connector

IP 68 per BWN Pr. 20
☐
CuZn nickel plated
PA 12
cable
2 × 0.34 mm²
cULus

BKS-B 19-13

BKS-B 19-11/-B 20-11/
BKS-B 19-12/-B 20-12



1.3

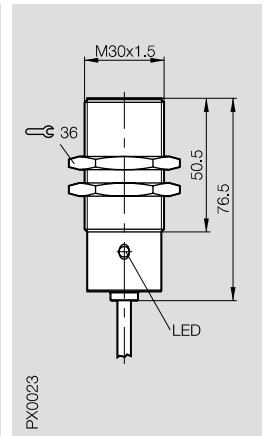
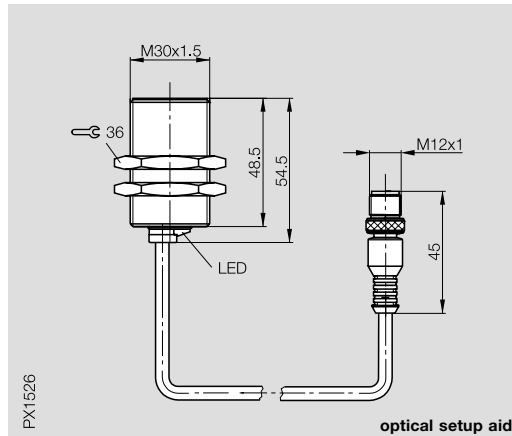
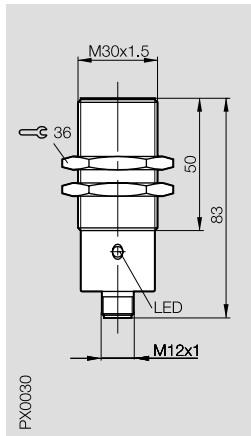
6

Connectors,
clamps ...
page 6.2 ...

Inductive Sensors

DC 2-Wire
M30
s_n 10 mm

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



Normally-open ⑨ ⑦	BES 516-540-S 4-H	BES M30MK-GSC10B-____-GS04	BES 516-540-B0-H-
Normally-closed ⑩	BES 516-541-S 4-H		BES 516-541-B0-H-
Rated operational voltage U _e	24 V DC	24 V DC	24 V DC
Supply voltage U _B	10...55 V DC	10...30 V DC polarized	10...55 V DC
Voltage drop U _d at I _e	≤ 5 V	≤ 3 V	≤ 5 V
Rated insulation voltage U _i	250 V AC	250 V AC	250 V AC
Rated operational current I _e	200 mA	100 mA	200 mA
Minimum operational current I _m	5 mA	3 mA	5 mA
Off-state current I _r	≤ 500 μA	≤ 700 μA	≤ 500 μA
Protected against polarity reversal	yes	yes	yes
Short circuit protected	yes	yes	yes
Load capacity	≤ 1 μF	≤ 0.2 μF	≤ 1 μF
Repeat accuracy R	≤ 5 %	≤ 5 %	≤ 5 %
Ambient temperature range T _a	-25...+70 °C	-25...+70 °C	-25...+70 °C
Frequency of operating cycles f	150 Hz	400 Hz	150 Hz
Utilization categories	DC 13	DC 13	DC 13
Function indication	yes	yes	yes
Degree of protection per IEC 60529	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20
Insulation class	□	□	□
Housing material	CuZn nickel plated	CuZn nickel plated	CuZn nickel plated
Material of sensing face	PA 12	PBT	PA 12
Connection	connector	cable with connector	cable
No. of wires x conductor cross section			2 x 0.34 mm ²
Approval	cULus		cULus
Recommended connector	BKS-B 19-11/-B 20-11/ BKS-B 19-12/-B 20-12	BKS-B 19-13	

⑨ Connection diagrams see page 1.0.12

Please add the cable length to the ordering code for sensors with **cable!**

Example: **BES 516-540-B0-H-05**

03, 05 = PVC, length 3 m or 5 m

PU-03, PU-05 = PUR, length 3 m or 5 m

or

Example: **BES M30MK-GSC10B-BP03**

BP03, BP05 = PUR, length 3 m or 5 m

Please add the cable length to the ordering code for sensors with **cable and connector!**

BP00,3, BP00,5 = PUR, length 0.3 m or 0.5 m



M30x1.5

flush

10 mm

0...8.1 mm

M30x1.5

non-flush

15 mm

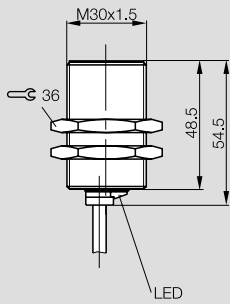
0...12.2 mm

M30x1.5

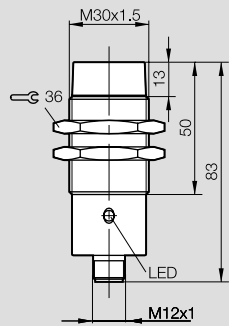
non-flush

15 mm

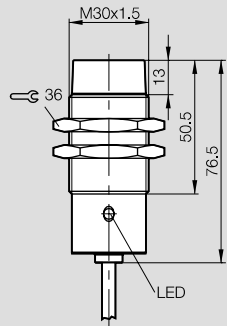
0...12.2 mm



optical setup aid



PX0102a



PX0024a

1.3

BES M30MK-GSC10B-

BES 516-548-S 4-H
BES 516-549-S 4-H

BES 516-548-B0-H-
BES 516-549-B0-H-

24 V DC

10...30 V DC polarized

≤ 3 V

250 V AC

100 mA

3 mA

≤ 700 µA

yes

yes

≤ 0.2 µF

≤ 5 %

-25...+70 °C

400 Hz

DC 13

yes

IP 68 per BWN Pr. 20



CuZn nickel plated

PBT

cable

2 × 0.34 mm²

24 V DC

10...55 V DC

≤ 5 V

250 V AC

200 mA

5 mA

≤ 500 µA

yes

yes

≤ 1 µF

≤ 5 %

-25...+70 °C

100 Hz

DC 13

yes

IP 68 per BWN Pr. 20



CuZn nickel plated

PA 12

connector

cULus

BKS-B 19-11/-B 20-11/
BKS-B 19-12/-B 20-12

24 V DC

10...55 V DC

≤ 5 V

250 V AC

200 mA

5 mA

≤ 500 µA

yes

yes

≤ 1 µF

≤ 5 %

-25...+70 °C

100 Hz

DC 13

yes

IP 68 per BWN Pr. 20



CuZn nickel plated

PA 12

cable

2 × 0.34 mm²

cULus



6

Connectors,
clamps ...
page 6.2 ...

