

Non-Contact Sensing of Metal Targets

In this section you'll find a wide variety of inductive proximity sensors, including smooth and threaded tubular styles, block styles, weld field immune electronics, impact-resistant steel sensing faces, miniature housings, versions with extended sensing range, high-pressure types, and other specialty application variants.

Inductive sensors are intended for non-contact detection of metallic targets at ranges generally under 50mm (2 inches). Based on the eddy current sensing principle, inductive proximity sensors emit an alternating electro-magnetic sensing field. When a metal target enters the sensing field, eddy currents are induced in the target, reducing the signal amplitude and triggering a change of state at the sensor output. Advantages of inductive proximity sensors include insensitivity to water, oil, dirt, non-metallic particles, target color, or target surface finish, and the ability to withstand high shock and vibration environments.

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 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories

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

Specialty

- SuperShorties™
- Proxinox®
- High Temp
- Analog
- Large Housing
- Ring Sensor

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**Standard Tubular
Inductive Sensors**



Housing Size	3 mm Smooth	4 mm Smooth	5 M Threaded	6.5 mm Smooth
Sensing Distance	2X	STD, 2X	STD, 2X	STD, 2X, 3X, 4X
Flush	1.0 mm	0.8, 1.5 mm	0.8, 1.5 mm	1.5, 2 mm
Non-flush	3.0 mm	–	–	2.5, 3, 4 mm
Connection Options	Cable	Cable Connector Cable w/connector	Cable Connector Cable w/connector	Cable Connector Cable w/connector
Pages	1.54	1.54	1.57	1.59
DC 3-/4- Wire Metal	1.54	1.54	1.57	1.59
AC 2-Wire Metal	–	–	–	–
AC/DC 2-Wire Metal	–	–	–	–
DC 2-Wire Metal	–	–	–	–

M5

Small Sensors –

With the smallest connectors on the market!

- Currently available on Ø 4 mm and M5 models
- 4-pin version, pin configuration per IEC 60947-5-2
- IP 67 rated
- Supply voltage 10...30 V

Ideal for applications requiring small sensors with small connectors:

- **Automation handling**
- **In-die sensing**



Selection Guide

Inductive Sensors

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	8 M Smooth & Threaded	12 M Threaded	18 M Threaded	30 M Threaded
	STD, 2X, 3X, 4X	STD, 2X, 3X, 4X	STD, 2X, 3X	STD, 2X, 3X
	1.5, 2 mm	2, 3, 4 mm	5, 8 mm	10, 15 mm
	2.5, 3, 4, 6 mm	4, 6, 7, 8, 10 mm	8, 12, 16, 20 mm	15, 22, 30, 40 mm
	Cable Connector Cable w/connector	Cable Connector Cable w/connector	Cable Connector Cable w/connector	Cable Connector Cable w/connector
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General Purpose Proximity Sensors

Balluff manufactures thousands of inductive proximity sensors for a wide variety of applications. Some special applications require products such as a rugged SteelFace® sensor while others may require a PTFE coated body for a weld cell application. However, if you have the need for a general purpose part presence or part detection sensor, Balluff's GlobalProx® family should be your sensor of choice.

Our GlobalProx sensors represent a broad range of top quality, value-priced general-purpose tubular inductive sensors. These DC 2-wire and 3-wire products are available in standard and 2X sensing ranges, standard body length and "shorty" models, plus offer a variety of connection and output options. All of these features are also offered at a great value. Balluff's GlobalProx sensor family is our lowest tubular list price models available.

GlobalProx – Great Quality, Great Selection, Great Value

GlobalProx®



Block Style Inductive Sensors



Housing Size	5x5 mm	8x8 mm	8x16, 10x30 mm	16.5x30 mm Minisensor
Sensing Distance	STD	STD, 2X, 3X	STD	STD
Flush	0.8 mm	1.5, 2, 3 mm	1.5, 2, 3 mm	2 mm
Non-flush	–	–	2.5, 3 mm	
Connection Options	Cable Connector	Cable Connector	Cable	Cable Connector Cable w/connector
Pages	1.94	1.94	1.96	1.98
DC 3-/4- Wire	1.94	1.94	1.96	1.99
AC/DC 2-Wire	–	–	–	–

Block Style Inductive Sensors



Housing Size	60.5x74 mm	40x40 mm Unicomact	40x40 mm Unisensor	80x80 mm Maxisensor
Sensing Distance	STD	STD	STD, 2X	STD
Flush	7 mm	20 mm	15, 20 mm	40 mm
Non-flush	–	30 mm	20, 25, 30, 25/40, 40 mm	50 mm
Connection Options	Screw terminals	Connector	Screw terminals Connector	Screw terminals Connector
Pages	1.104	1.105	1.106, 1.123	1.108, 1.139
DC 3-/4- Wire	1.104	1.105	1.106	1.108
AC/DC 2-Wire	–	1.122	1.123	1.124
DC 2-Wire	–	1.138	–	1.139



Mini plastic housing block sensors

- 8x16x4, 1.5mm Sn, (PNP & NPN)
- 30x10x6, 3mm Sn, (PNP & NPN)
- Commonly used in automation/handling
- Fits in tight small areas
- Easy top mounting



26x40 mm Midisensors	17.5x28 mm	25x50 mm	20x32 mm	42x48 mm
STD	STD	STD	STD	STD
2, 4 mm	–	5 mm	7 mm	5 mm
–	5 mm	–	–	–
Cable Connector	Cable	Cable Connector Cable w/connector	Cable Cable w/connector	Screw terminals Connector
1.99, 1.122	1.100	1.102	1.103	1.104
1.99	1.100	1.102	1.103	1.104
1.122	–	–	–	–



Midi-sensor with 45° corner

- 26 x 32 x 12mm
- PNP NO and NC with S49 and Cable
- NPN NO and NC with S49 and Cable
- AC/DC 20...250 V, 130mA short circuit protected, cable versions NO/NC
- All Types 2 or 4mm Shielded (2X Extended sensing range)



New DC Maxisensor

- One piece molded design
- More visible LEDs
- 40 mm and 50 mm sensing ranges



Q40 Unicomact

- Replaces old Q40 design
- Shorter overall housing length
- More robust housing design
- Factor 1 versions also available

Miniblock R01 Sensors

Mini size – Maximum performance

- Compact size with superior sensing range
- Rugged metal housing
- Narrow package can be used in applications where standard tubular sensors are too large
- Fully embeddable in steel



GlobalProx®



Steelface®



Factor 1



Weld Field Immune



Housings Available	Ø6.5, M8, M12, M18, M30 Tubular	M8, M12, M18, M30 Tubular	M12, M18, M30 Tubular; 40x40 Block	M12, M18, M30 Tubular; 20x32, 40x40, 83x83 Block
Sensing Distance	STD, 2x	STD, 2x, 3x	STD, 2X	STD
Flush	1.5-15 mm	1.5, 2, 5, 8 mm	3, 5, 10, 15, 20 mm	2, 5, 10, 15, 40, 50 mm
Non-flush	4-30 mm	–	8, 12, 20, 35, 40 mm	4, 8, 15, 50, 65 mm
Connection Options	Cable Connector Cable w/connector	Connector	Connector	Cable Connector Cable w/connector
Features & Benefits	<ul style="list-style-type: none"> – 1x and 2x sensing ranges – Flush and non-flush models – Standard and "shorty" body length – Great performance – Great value 	<ul style="list-style-type: none"> – One-piece stainless steel housing withstands abusive environments – Multi-metal ferrous and nonferrous sensing 	<ul style="list-style-type: none"> – Magnetic field-immune circuitry – Senses all metals at the same distance – High-quality PTFE coated versions – Extremely impervious active surface – Flush or non-flush mountable 	<ul style="list-style-type: none"> – Magnetic field immune electronic circuitry – Sensing surfaces made of temperature-rated plastic, Teflon coated – LED for function indication
Pages	1.12	1.22	1.30	1.36
DC 3-/4- Wire	1.12	1.22	1.30	1.36
AC/DC 2-Wire	–	1.26	–	1.39
DC 2-Wire	1.18	–	–	–

SuperShorties™



Proxinox®



High Temperature



Analog



Housings Available	Ø6.5, M8 Tubular	M12, M18, M30 Tubular	M12 – M30 Tubular 25x50 Block	Ø6.5 – M30 Tubular 80x80 Block
Sensing Distance	STD	STD	STD, 2X	STD
Flush	1.5 mm	2, 4, 5, 10 mm	0.5, 1, 2, 5, 10 mm	0...10V, 0-20mA, 4-20mA
Non-flush	–	4, 8, 15 mm	15 mm	0...10V
Connection Options	Cable Connector	Cable Connector	PVC/105 °C, PTFE, or Silicon Cable	Cable Connector Cable w/connector
Features & Benefits	<ul style="list-style-type: none"> – Ultra compact design – Light weight – Built in amplifier – Smooth and threaded body styles 	<ul style="list-style-type: none"> – Harsh duty rated – Ideal for machine tool, chemical, packaging and food industries – Highly flexible PuFlex cables – SMD technology avoids short circuit and polarity reversal 	<ul style="list-style-type: none"> – Withstand high radiant heat of liquid glass – Operate in ambient temperatures from -25 to up to +120°C (+248°F) – IP67 rated – 3-wire DC, 10-30 volts – PNP/NPN logic – NO/NC outputs 	<ul style="list-style-type: none"> – Harsh duty rated – Ideal for relatively short metal target travel – Extended linear measuring range – Linear analog signal available in voltage or current – Increased linearity – Reduced output signal temperature drift
Pages	1.142	1.146	1.154	1.159
DC 3-/4- Wire	1.142	1.146	1.154	1.159
AC/DC 2-Wire	–	–	–	–
DC 2-Wire	–	–	–	–

SlagMaster®



**M8, M12, M18, M30
Tubular
20x32x8 Block**

STD, 2x

2, 3, 4, 8, 15 mm

4, 8, 15, 50, 65 mm

Cable
Connector

Cable w/connector

- Dramatically increases the life of a sensor in welding environments
- Designed to withstand resistance welding application
- Resists weld slag, high heat, and physical damage

1.30

1.30

1.39

1.45

Slag-resistant coating for welding applications

- Dramatically increases the life of a sensor in welding environments
- Designed to withstand resistance welding applications
- Resists weld slag, high heat, and physical damage



Large Housing



**80, 90, 100, 153, 163
Pancake;
100, 150, 120 Bar**

STD

-

45, 50, 70, 100 mm

Cable
Connector

- AC and DC versions
- Bar sensors are adjustable from 5 - 45 mm
- Multiple housing sizes

1.172

-

-

-

Ring Sensors



**80x45, 120x80
Block Style**

STD

10 mm

25, 45 mm

Cable
Connector

- PNP and NPN versions
- N/O and N/C versions
- Time delay on some models
- Adjustable sensing distances

1.176

-

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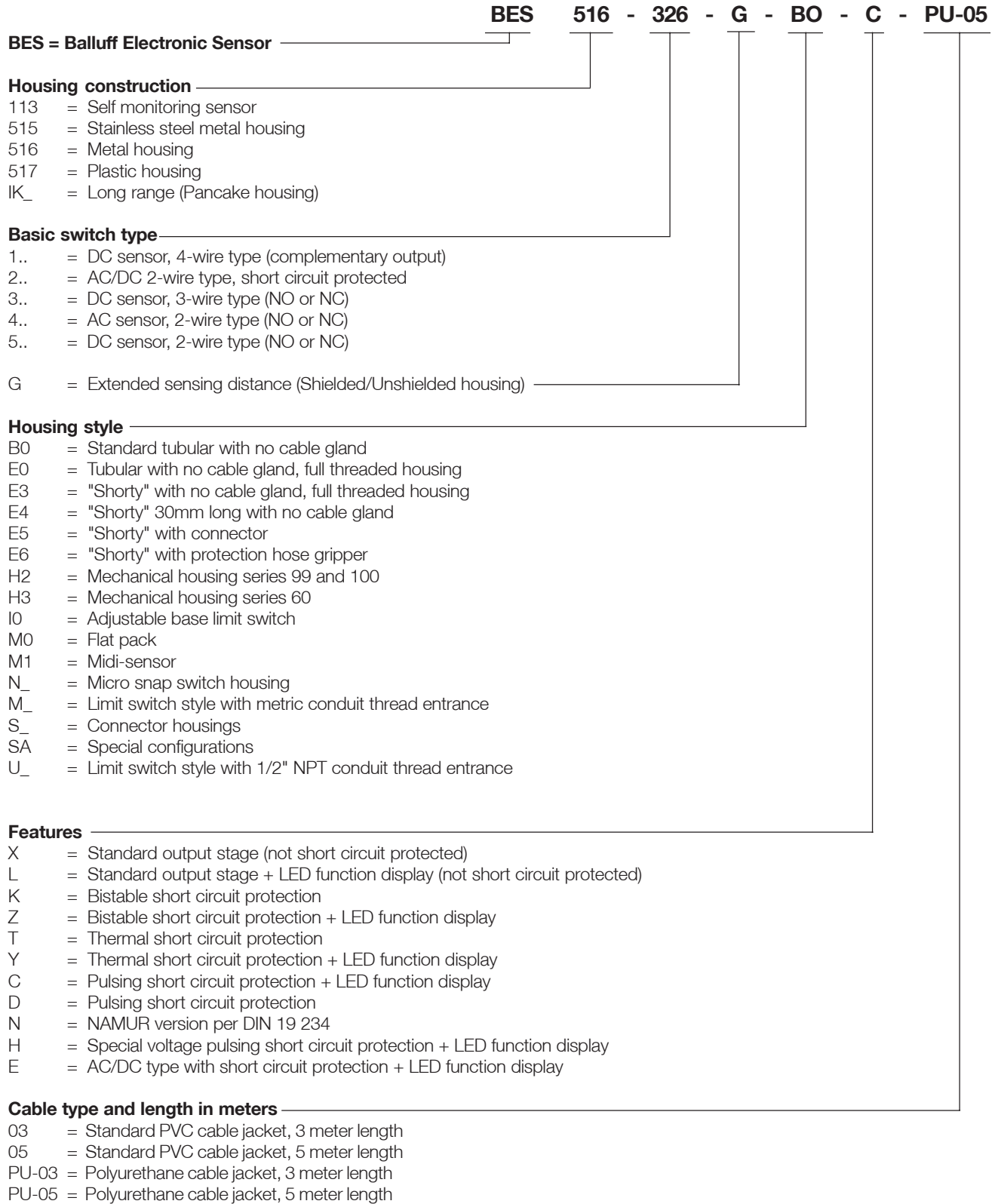
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SuperShorties™

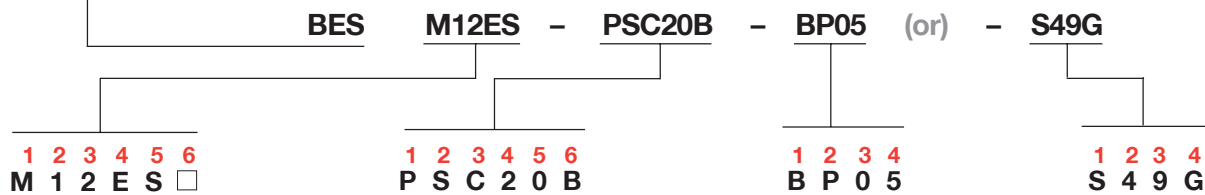
- Ultra compact design
- Incorporates amplifier
- Smooth and threaded body types
- Flush mountable



! Certain combinations may not be available.
Please refer to the actual catalog page or
contact the factory for available types.



BES = Balluff Electronic Sensor



1 2 3 4 5 6
M 1 2 E S □

Mechanical Field

1st position:

Housing Finish

G = Cylindrical smooth housing

M = Cylindrical threaded housing

Z = Without housing form

Q = Block housing

R = Rectangular housing

Z = Special housing

2nd & 3rd position:

Dimension size in mm

4th position:

Housing Material

A = Aluminum

E = Stainless Steel

K = Plastic

M = Nickel Plated Brass

Z = Zinc Casting

5th position:

Length

L = Standard housing length per IEC 947-5-2

E = Shorty, 30mm for DC sensors

K = Threaded length of 40mm (M8 to M30)

Other letters

= Special lengths

C & E

= Location of sensing face for block sensors

6th position:

Used with 5th for additional special lengths. The 6th position is often not used.

1 2 3 4 5 6
P S C 2 0 B

Electrical/Sensing Field

1st position:

Technical

G = Polarized 2-wire

U = Nonpolarized 2-wire

P = PNP 3-wire

N = NPN 3-wire

2nd position:

Function

A = Complementary (NO/NC)

G = Complementary (push/pull)

S = NO

O = NC

P = Programmable (NO or NC)

3rd position:

Voltage, Range, LED, Short Circuit Protection

A = 35-250V, AC no SCP, LED

C = 10-30V, DC, SCP, LED

D = 10-30V, DC, SCP, w/o LED

H = 10-55V, DC SCP, LED

J = 10-55V, DC, no SCP, w/o LED

U = 25-250V, AC/DC, SCP, LED

L = 10-30V, DC, no SCP, LED

V = 20-140V, AC/DC, LED

4th & 5th position:

Rated Operating Distance

08 = 0.8mm

10 = 1mm or 10mm

25 = 2.5mm or 25mm

etc...

6th position:

Mounting

B = Shielded

F = Unshielded

A = Shielded (only for Factor 1)

E = Unshielded

(only for Factor 1)

1 2 3 4
B P 0 5

Cable

1st position

A = Straight cable gland (AO)

B = Standard tubular with no cable gland (BO)

C = 90° cable gland

D = Flexible cable gland (DO)

E = Fully threaded with no cable gland (EO)

Cable Material

2nd position

P = PUR

V = PVC

X = Irradiated PVC

S = Silicon

T = PTFE

Cable Length

3rd & 4th position

10 = 10 meter

05 = 5 meter

03 = 3 meter

.1 = 0.1 meter

etc...

1 2 3 4
S 4 9 G

Connector

Connector Types

1st, 2nd & 3rd position

S04 = S4 DC Micro connector

S05 = S5 AC or DC Mini connector

S21 = S21 AC Micro connector

S27 = S27 AC Euro Micro connector

S49 = S49 DC Nano connector

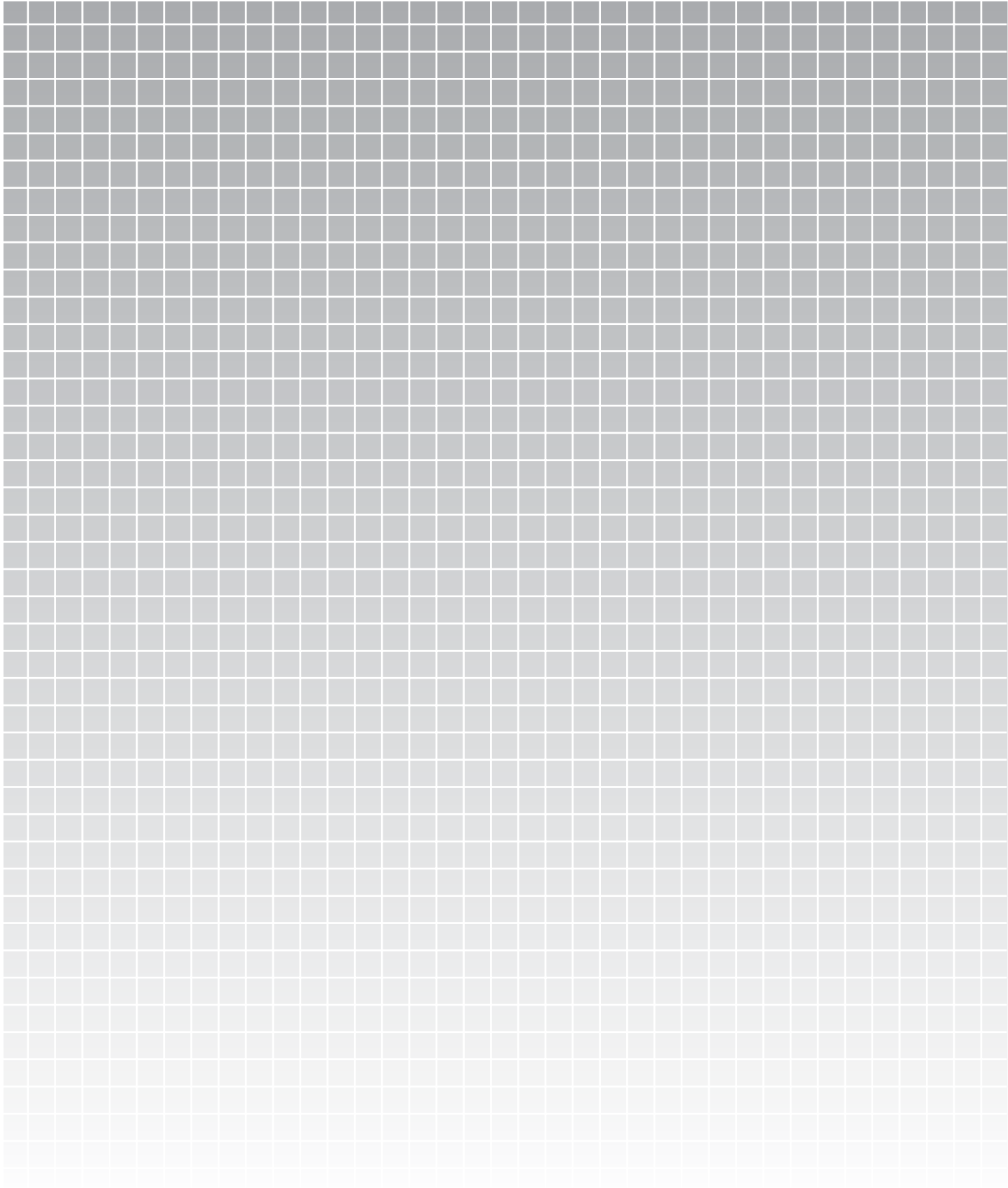
4th position

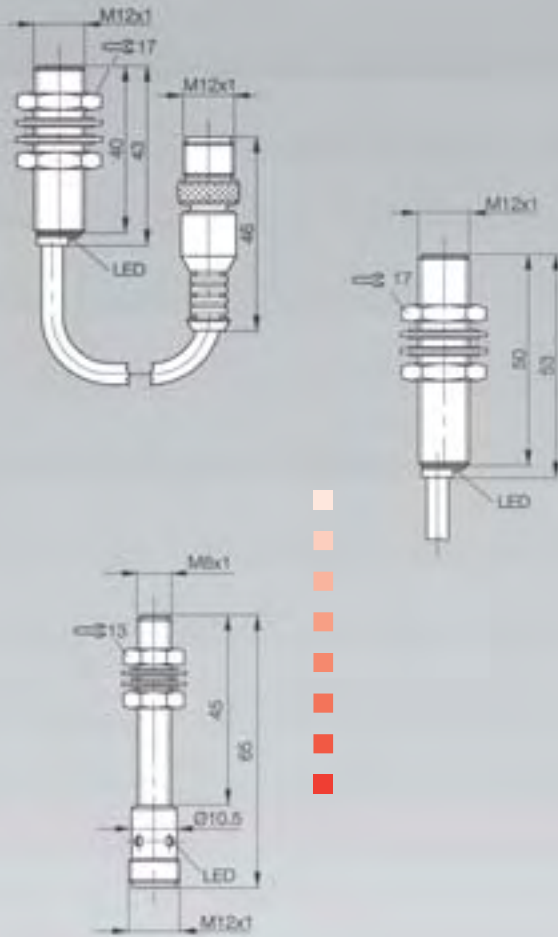
G = Straight connector (axial)

R = Right angle connector

K = Straight connector (plastic)

! Certain combinations may not be available. Please refer to the actual catalog page or contact the factory for available types.





Brand Name Sensors at No-Name Prices

Now you don't have to take chances with no-name online sensors to get a sensor priced within your budget. Balluff's GlobalProx® line represents a broad range of top-quality, value-priced general-purpose tubular inductive sensors. Advances in integrated circuit technology and high-volume production techniques enable Balluff to offer high-quality, high-performance sensors without high prices. Built to the same high standards as all Balluff inductive proximity sensors, GlobalProx quality is second to none. After enduring a rigorous initial design acceptance program, all GlobalProx sensors are 100% tested at the end of production to guarantee conformity with critical published specifications. With GlobalProx as your "go to" choice for inductive sensing, you're covered: the CE mark, cULus listing, and Balluff lifetime warranty are your guarantees of quality and reliability.

- 1.12** DC 3-wire
- 1.18** DC 2-wire

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

- Specialty
 - SuperShorties™
 - Proxinox®
 - High Temp
 - Analog
 - Large Housing
 - Ring Sensor

6 Connectors

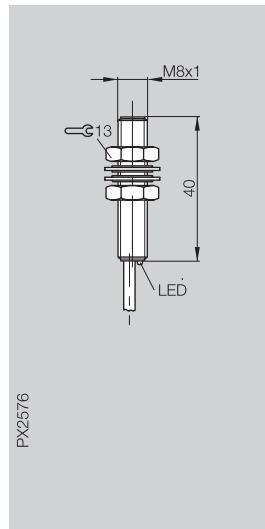
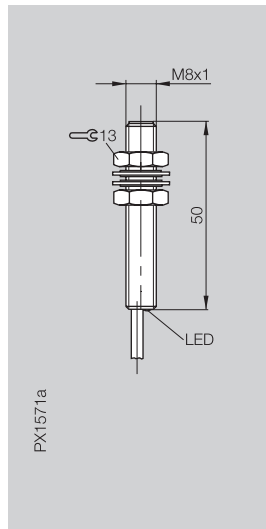
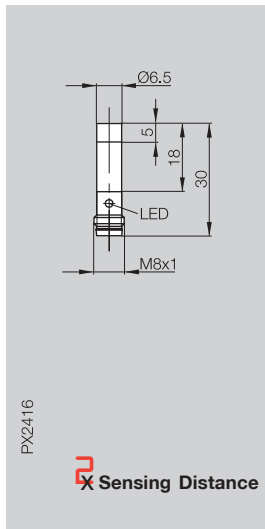
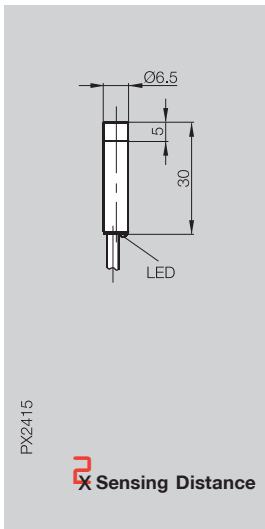
7 Accessories

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Housing Size	Ø 6.5 mm	Ø 6.5 mm	M8 x 1	M8 x 1
Mounting	non-flush	non-flush	flush	flush
Rated Operating Distance s_n	4 mm	4 mm	1.5 mm	1.5 mm
Assured Operating Distance s_a	0...3.2 mm	0...3.2 mm	0...1.2 mm	0...1.2 mm

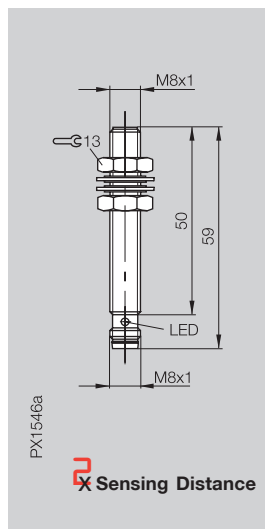
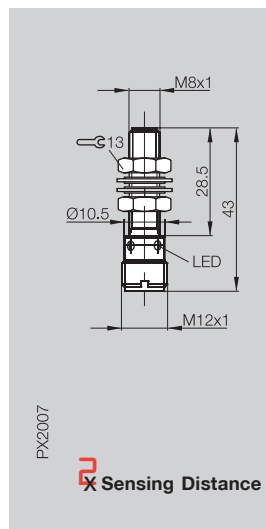
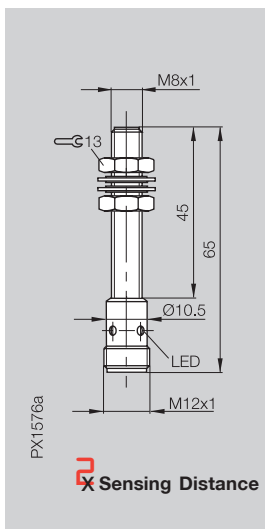
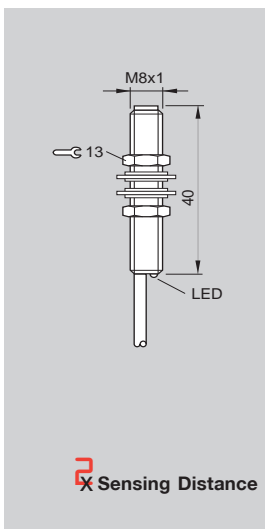


PNP Normally-open	BES G06ED-PSC40F-BV03	BES G06EB-PSC40F-S49G	BES M08MI-PSC15B-BV03	BES M08EF-PSC15B-BP02-003
PNP Normally-closed	BES G06ED-POC40F-BV03	BES G06EB-POC40F-S49G	BES M08MI-POC15B-BV03	BES M08EF-POC15B-BP02-003

NPN Normally-open	BES G06ED-NSC40F-BV03	BES G06EB-NSC40F-S49G	BES M08MI-NSC15B-BV03	BES M08EF-NSC15B-BP02-003
NPN Normally-closed	BES G06ED-NOC40F-BV03	BES G06EB-NOC40F-S49G		BES M08EF-NOC15B-BP02-003

Detailed Specifications	p. 1.61	p. 1.61	p. 1.62	p. 1.63
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Housing Size	M8 x 1	M8 x 1	M8 x 1	M8 x 1
Mounting	flush	flush	flush	flush
Rated Operating Distance s_n	2 mm	2 mm	2 mm	2 mm
Assured Operating Distance s_a	0...1.6 mm	0...1.6 mm	0...1.6 mm	0...1.6 mm

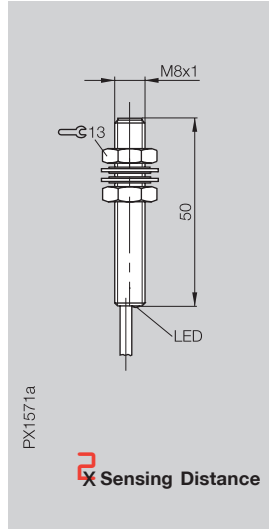
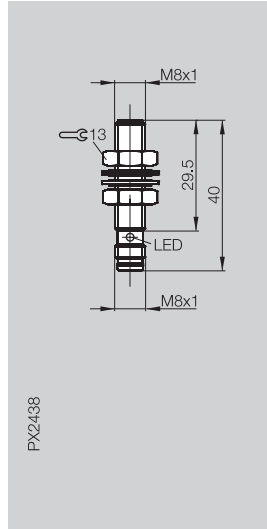
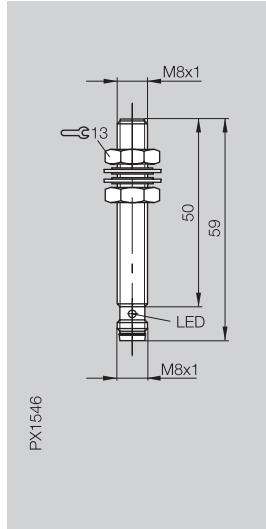
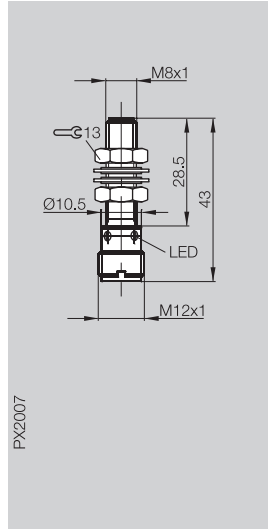
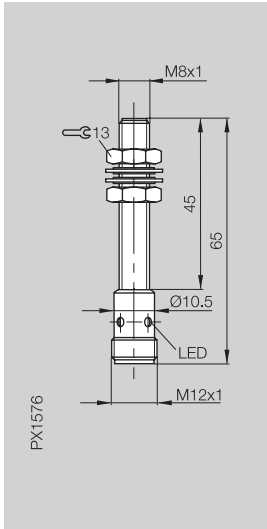


PNP Normally-open	BES M08EF-PSC20B-BV02-003	BES M08MH1-PSC20B-S04G	BES M08EE-PSC20B-S04G-003	BES M08MI-PSC20B-S49G
PNP Normally-closed	BES M08EF-POC20B-BV02-003		BES M08EE-POC20B-S04G-003	

NPN Normally-open	BES M08EF-NSC20B-BV02-003	BES M08MH1-NSC20B-S04G	BES M08EE-NSC20B-S04G-003	BES M08MI-NSC20B-S49G
NPN Normally-closed	BES M08EF-NOC20B-BV02-003		BES M08EE-NOC20B-S04G-003	

Detailed Specifications	p. 1.66	p. 1.66	p. 1.67	p. 1.67
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M8 x 1 flush 1.5 mm 0...1.2 mm	M8 x 1 flush 1.5 mm 0...1.2 mm	M8 x 1 flush 1.5 mm 0...1.2 mm	M8 x 1 flush 1.5 mm 0...1.2 mm	M8 x 1 flush 2 mm 0...1.6 mm
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BES M08MH1-PSC15B-S04G
BES M08MH1-POC15B-S04G

BES M08EE-PSC15B-S04G-003
BES M08EE-POC15B-S04G-003

BES M08MI-PSC15B-S49G

BES M08EE-PSC15B-S49G-003
BES M08EE-POC15B-S49G-003

BES M08MI-PSC20B-BV03

BES M08MH1-NSC15B-S04G
BES M08MH1-NOC15B-S04G

BES M08EE-NSC15B-S04G-003
BES M08EE-NOC15B-S04G-003

BES M08MI-NSC15B-S49G

BES M08EE-NSC15B-S49G-003
BES M08EE-NOC15B-S49G-003

BES M08MI-NSC20B-BV03

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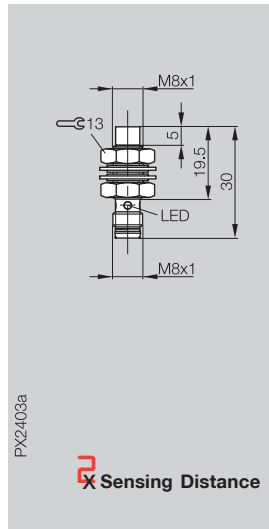
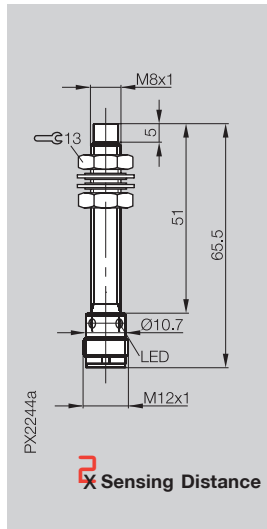
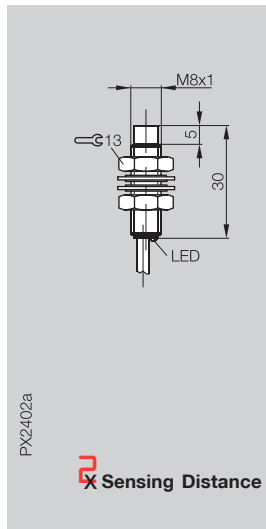
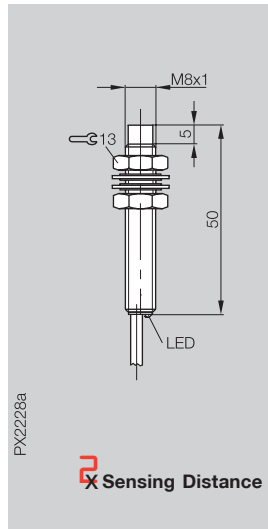
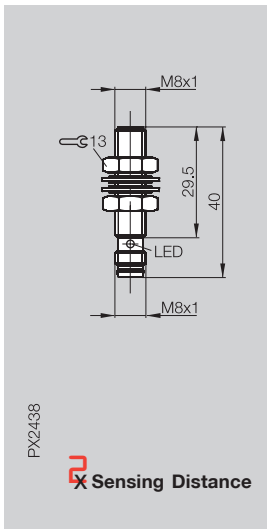
M8 x 1 flush 2 mm 0...1.6 mm

M8 x 1 non-flush 4 mm 0...3.2 mm

M8 x 1 non-flush 4 mm 0...3.2 mm

M8 x 1 non-flush 4 mm 0...3.2 mm

M8 x 1 non-flush 4 mm 0...3.2 mm



BES M08EE-PSC20B-S49G-003
BES M08EE-POC20B-S49G-003

BES M08EG-PSC40F-BV02
BES M08EG-POC40F-BV02

BES M08ED-PSC40F-BV02
BES M08ED-POC40F-BV02

BES M08EH-PSC40F-S04G
BES M08EH-POC40F-S04G

BES M08EB-PSC40F-S49G
BES M08EB-POC40F-S49G

BES M08EE-NSC20B-S49G-003
BES M08EE-NOC20B-S49G-003

BES M08EG-NSC40F-BV02
BES M08EG-NOC40F-BV02

BES M08ED-NSC40F-BV02
BES M08ED-NOC40F-BV02

BES M08EH-NSC40F-S04G
BES M08EH-NOC40F-S04G

BES M08EB-NSC40F-S49G
BES M08EB-NOC40F-S49G

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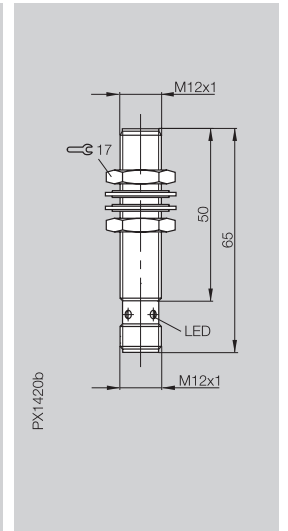
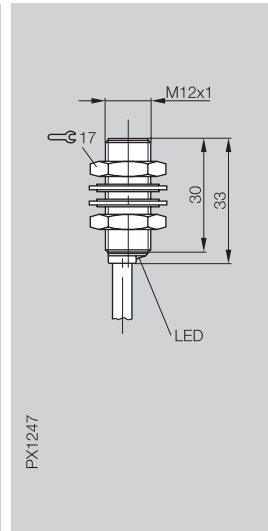
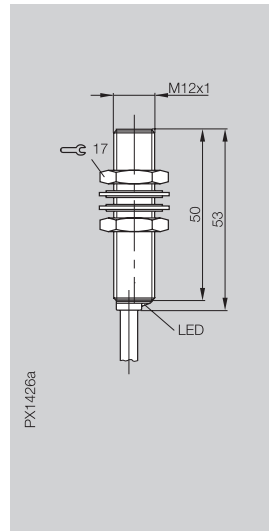
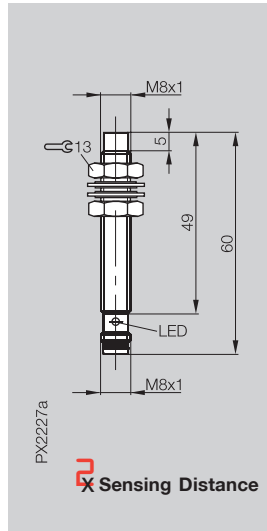
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p. 1.70

- Contents
- Selection Charts
- Part Numbers
- Featured
 - GlobalProx®**
 - DC 3-Wire
 - DC 2-Wire
 - SteelFace®
 - 2x
 - 3x
 - Fe/NFe
 - Welding
 - Factor 1
 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories

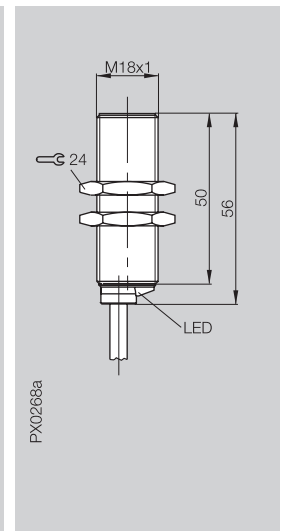
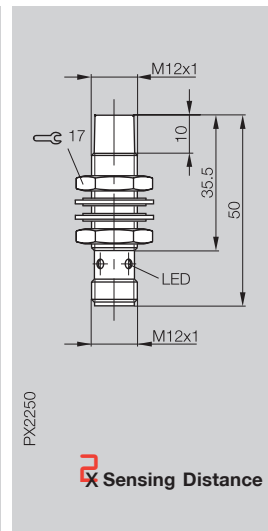
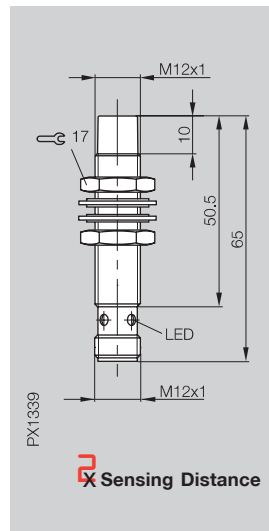
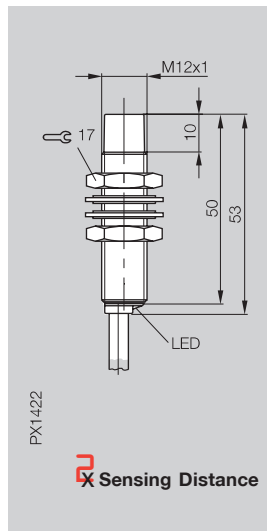
- Standard
 - DC 3-/4-Wire Tubular
 - DC 3-/4-Wire Block
 - AC 2-Wire Tubular
 - AC/DC 2-Wire Tubular
 - AC/DC 2-Wire Block
 - DC 2-Wire Tubular
 - DC 2-Wire Block
- Specialty
 - SuperShorties™
 - Proxinox®
 - High Temp
 - Analog
 - Large Housing
 - Ring Sensor

Housing Size	M8 x 1	M12 x 1	M12 x 1	M12 x 1
Mounting	non-flush	flush	flush	flush
Rated Operating Distance s_n	4 mm	2 mm	2 mm	2 mm
Assured Operating Distance s_a	0...3.2 mm	0...1.6 mm	0...1.6 mm	0...1.6 mm



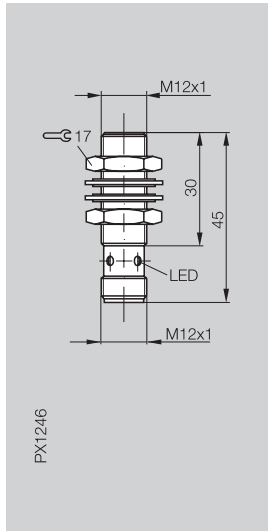
PNP Normally-open	BES M08EH-PSC40F-S49G	BES M12MI-PSC20B-BV02	BES M12MD-PSC20B-BP02-003	BES M12MI-PSC20B-S04G
PNP Normally-closed	BES M08EH-POC40F-S49G	BES M12MI-POC20B-BV02	BES M12MD-POC20B-BP02-003	BES M12MI-POC20B-S04G
NPN Normally-open	BES M08EH-NSC40F-S49G	BES M12MI-NSC20B-BV02	BES M12MD-NSC20B-BP02-003	BES M12MI-NSC20B-S04G
NPN Normally-closed	BES M08EH-NOC40F-S49G		BES M12MD-NOC20B-BP02-003	BES M12MI-NOC20B-S04G
Detailed Specifications	p. 1.71	p. 1.72	p. 1.72	p. 1.73

Housing Size	M12 x 1	M12 x 1	M12 x 1	M18 x 1
Mounting	non-flush	non-flush	non-flush	flush
Rated Operating Distance s_n	8 mm	8 mm	8 mm	5 mm
Assured Operating Distance s_a	0...6.5 mm	0...6.5 mm	0...6.5 mm	0...4.1 mm

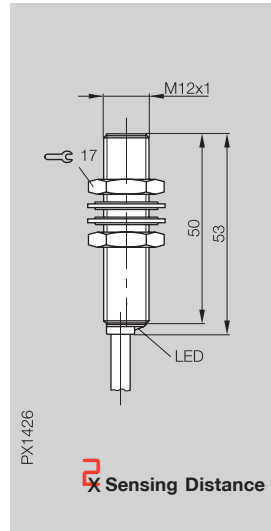


PNP Normally-open	BES M12MG-PSC80F-BV02	BES M12MG-PSC80F-S04G	BES M12MC1-PSC80F-S04G	BES M18MI-PSC50B-BV03
PNP Normally-closed	BES M12MG-POC80F-BV02	BES M12MG-POC80F-S04G	BES M12MC1-POC80F-S04G	BES M18MI-POC50B-BV03
NPN Normally-open	BES M12MG-NSC80F-BV02	BES M12MG-NSC80F-S04G	BES M12MC1-NSC80F-S04G	BES M18MI-NSC50B-BV03
NPN Normally-closed	BES M12MG-NOC80F-BV02	BES M12MG-NOC80F-S04G	BES M12MC1-NOC80F-S04G	
Detailed Specifications	p. 1.79	p. 1.79	p. 1.80	p. 1.81

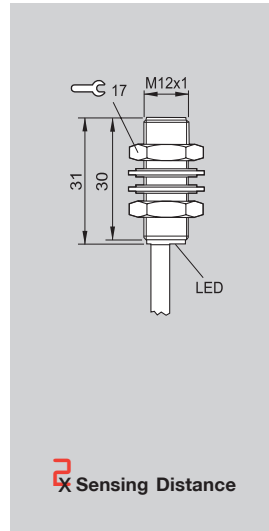
M12 x 1
flush
2 mm
0...1.6 mm



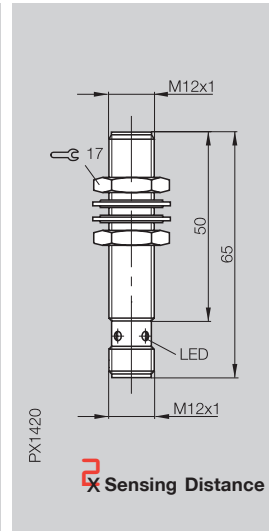
M12 x 1
flush
4 mm
0...3.2 mm



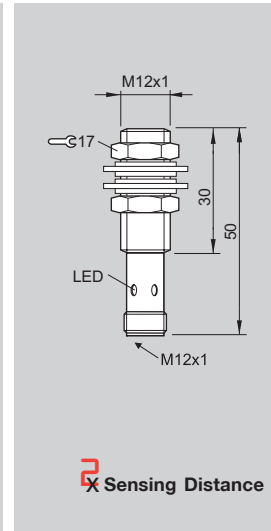
M12 x 1
flush
4 mm
0...3.2 mm



M12 x 1
flush
4 mm
0...3.2 mm



M12 x 1
flush
4 mm
0...3.2 mm



BES M12ME-PSC20B-S04G-003
BES M12ME-POC20B-S04G-003

BES M12MI-PSC40B-BV03
BES M12MI-POC40B-BV03

BES M12MD-PSC40B-BP02-003
BES M12MD-POC40B-BP02-003

BES M12MI-PSC40B-S04G
BES M12MI-POC40B-S04G

BES M12ME-PSC40B-S04G-003
BES M12ME-POC40B-S04G-003

BES M12ME-NSC20B-S04G-003
BES M12ME-NOC20B-S04G-003

BES M12MI-NSC40B-BV03

BES M12MD-NSC40B-BP02-003
BES M12MD-NOC40B-BP02-003

BES M12MI-NSC40B-S04G
BES M12MI-NOC40B-S04G

BES M12ME-NSC40B-S04G-003
BES M12ME-NOC40B-S04G-003

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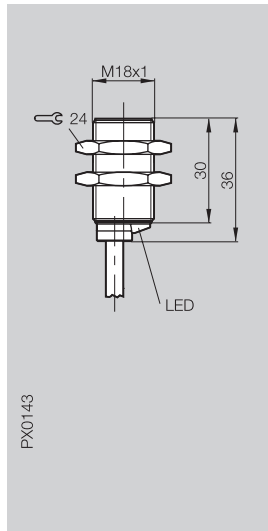
p. 1.74

p. 1.75

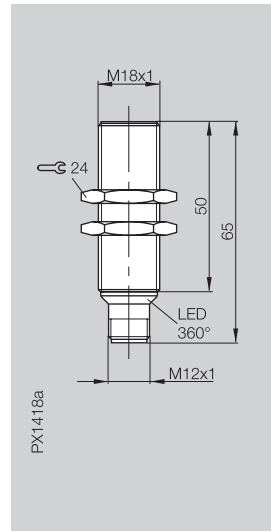
p. 1.76

p. 1.76

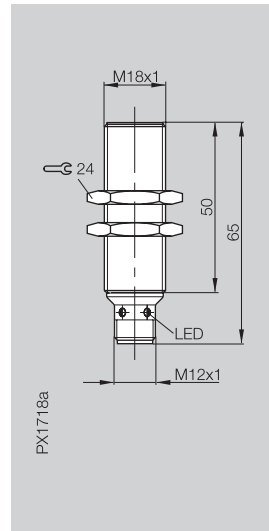
M18 x 1
flush
5 mm
0...4.1mm



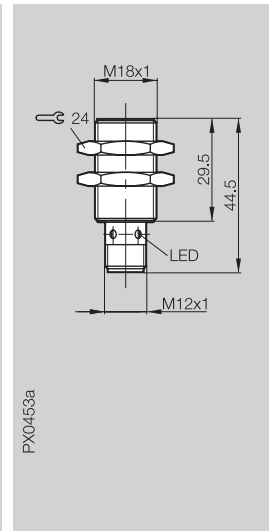
M18 x 1
flush
5 mm
0...4.1 mm



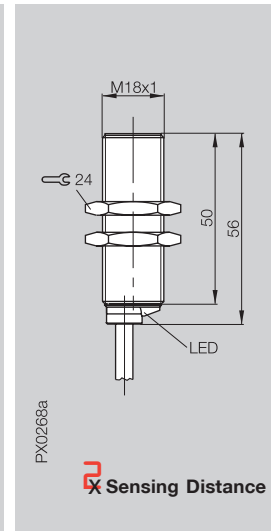
M18 x 1
flush
5 mm
0...4.1 mm



M18 x 1
flush
5 mm
0...4.1 mm



M18 x 1
flush
8 mm
0...6.5 mm



BES M18MD-PSC50B-BP02-003
BES M18MD-POC50B-BP02-003

BES M18MI-PSC50B-S04K
BES M18MI-POC50B-S04K

BES M18MI-PSC50B-S04G

BES M18ME-PSC50B-S04G-003
BES M18ME-POC50B-S04G-003

BES M18MI-PSC80B-BV03

BES M18MD-NSC50B-BP02-003

BES M18MI-NSC50B-S04K
BES M18MI-NOC50B-S04K

BES M18MI-NSC50B-S04K

BES M18ME-NSC50B-S04G-003

BES M18MI-NSC80B-BV03

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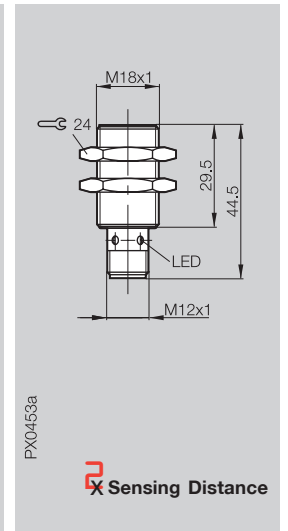
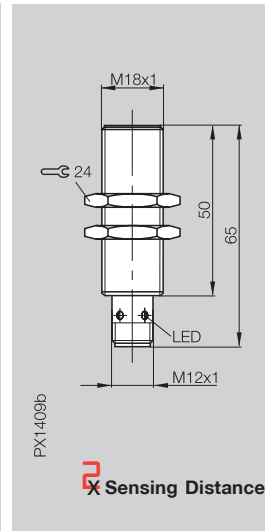
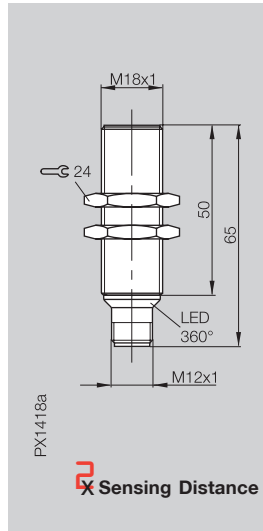
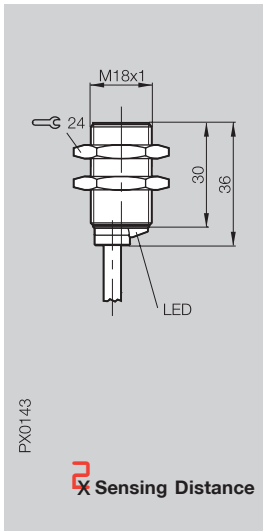
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- Contents
- Selection Charts
- Part Numbers
- Featured
 - GlobalProx®
 - DC 3-Wire
 - DC 2-Wire
 - SteelFace®
 - 2x
 - 3x
 - Fe/NFe
 - Welding
 - Factor 1
 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories

- 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
 - DC 2-Wire Block
- Specialty
 - SuperShorties™
 - Proxinox®
 - High Temp
 - Analog
 - Large Housing
 - Ring Sensor

Housing Size	M18x1	M18x1	M18x1	M18x1
Mounting	flush	flush	flush	flush
Rated Operating Distance s_n	8 mm	8 mm	8 mm	8 mm
Assured Operating Distance s_a	0...6.5 mm	0...6.5 mm	0...6.5 mm	0...6.5 mm

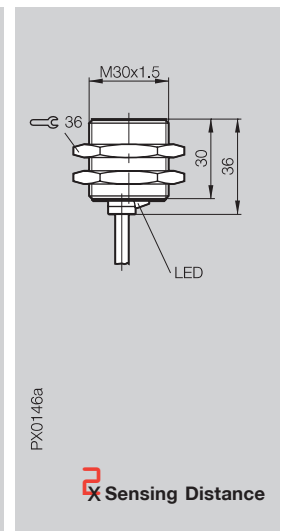
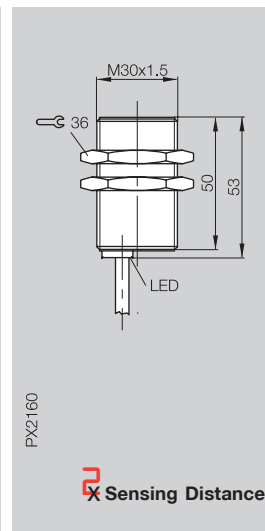
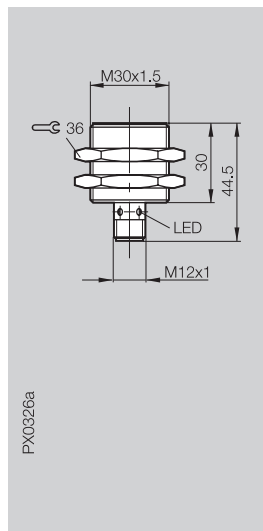
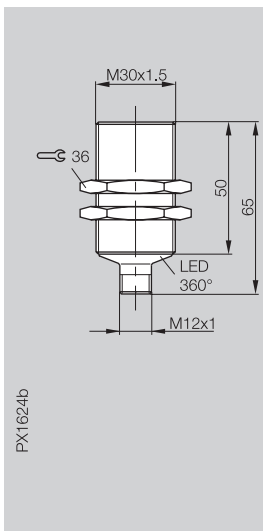


PNP Normally-open	BES M18MD-PSC80B-BP02-003	BES M18MI-PSC80B-S04K	BES M18MI-PSC80B-S04G	BES M18ME-PSC80B-S04G-003
PNP Normally-closed	BES M18MD-POC80B-BP02-003	BES M18MI-POC80B-S04K		BES M18ME-POC80B-S04G-003

NPN Normally-open	BES M18MD-NSC80B-BP02-003	BES M18MI-NSC80B-S04K		BES M18ME-NSC80B-S04G-003
NPN Normally-closed	BES M18MD-NOC80B-BP02-003		BES M18MI-NOC80B-S04G	

Detailed Specifications	p. 1.83	p. 1.84	p. 1.84	p. 1.84
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Housing Size	M30x1.5	M30x1.5	M30x1.5	M30x1.5
Mounting	flush	flush	flush	flush
Rated Operating Distance s_n	10 mm	10 mm	15 mm	15 mm
Assured Operating Distance s_a	0...8.1 mm	0...8.1 mm	0...12.2 mm	0...12.0 mm



PNP Normally-open	BES M30MI-PSC10B-S04K	BES M30ME-PSC10B-S04G-003	BES M30MI-PSC15B-BV02	BES M30MD-PSC15B-BP02-003
PNP Normally-closed	BES M30MI-POC10B-S04K	BES M30ME-POC10B-S04G-003	BES M30MI-POC15B-BV02	BES M30MD-POC15B-BP02-003

NPN Normally-open	BES M30MI-NSC10B-S04K	BES M30ME-NSC10B-S04G-003		BES M30MD-NSC15B-BP02-003
NPN Normally-closed	BES M30MI-NOC10B-S04K			

Detailed Specifications	p.1.88	p.1.88	p.1.89	p.1.89
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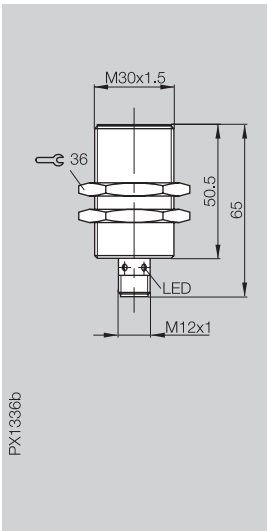
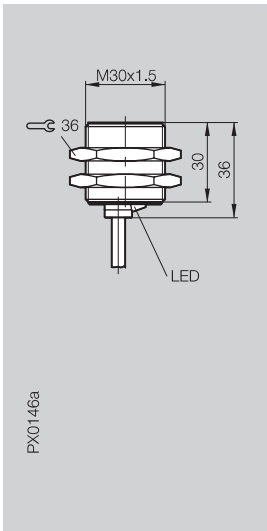
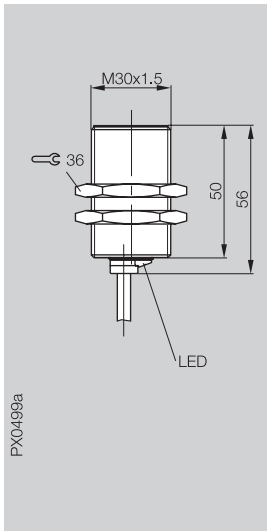
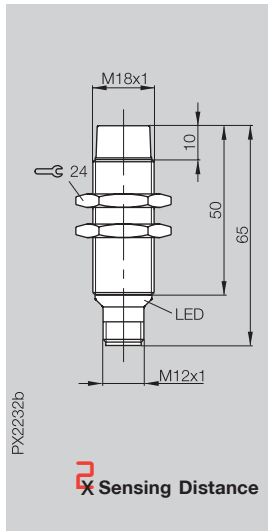
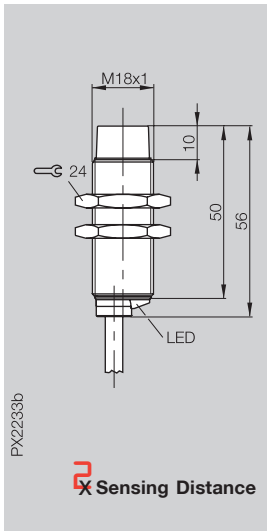
M18x1
non-flush
16 mm
0...12.8 mm

M18x1
non-flush
16 mm
0...12.8 mm

M30x1.5
flush
10 mm
0...8.1 mm

M30x1.5
flush
10 mm
0...8.1 mm

M30x1.5
flush
10 mm
0...8.1 mm



BES M18MG-PSC16F-BV02
BES M18MG-POC16F-BV02

BES M18MG-PSC16F-S04K
BES M18MG-POC16F-S04K

BES M30MI-PSC10B-BV02
BES M30MI-POC10B-BV02

BES M30MD-PSC10B-BP02-003

BES M30MI-PSC10B-S04G

BES M18MG-NSC16F-BV02
BES M18MG-NOC16F-BV02

BES M18MG-NSC16F-S04K
BES M18MG-NOC16F-S04K

BES M30MI-NSC10B-BV02
BES M30MI-NOC10B-BV02

BES M30MD-NSC10B-BP02-003

BES M30MI-NSC10B-S04G

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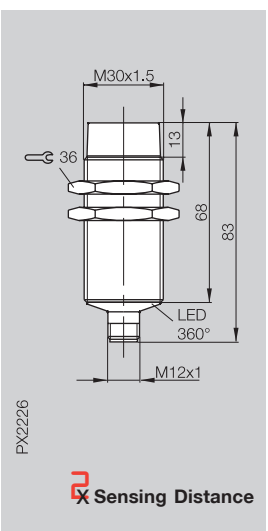
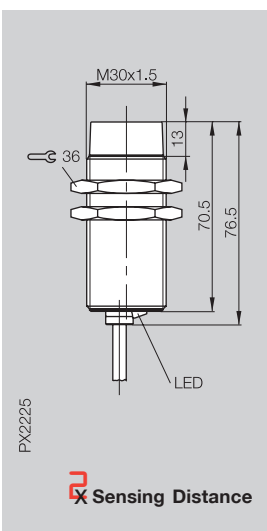
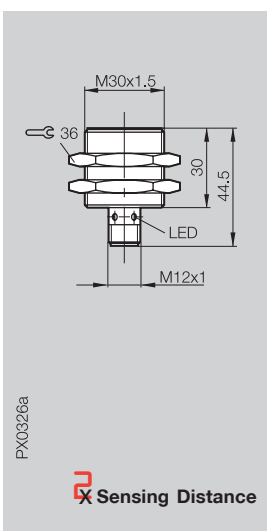
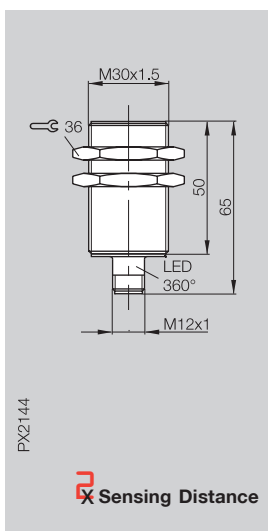
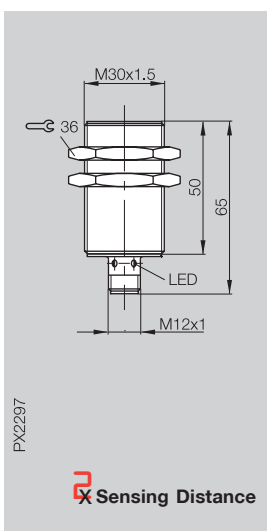
M30x1.5
flush
15 mm
0...12.2 mm

M30x1.5
flush
15 mm
0...12.2 mm

M30x1.5
flush
15 mm
0...12.0 mm

M30x1.5
non-flush
30 mm
0...24.3 mm

M30x1.5
non-flush
30 mm
0...24.3 mm



BES M30MI-PSC15B-S04G

BES M30MI-PSC15B-S04K
BES M30MI-POC15B-S04K

BES M30ME-PSC15B-S04G-003
BES M30ME-POC15B-S04G-003

BES M30MM-PSC30F-BV02
BES M30MM-POC30F-BV02

BES M30MM-PSC30F-S04K
BES M30MM-POC30F-S04K

BES M30MI-NSC15B-S04K
BES M30MI-NOC15B-S04K

BES M30MI-NSC15B-S04K
BES M30MI-NOC15B-S04K

BES M30MM-NSC30F-BV02
BES M30MM-NOC30F-BV02

BES M30MM-NSC30F-S04K
BES M30MM-NOC30F-S04K

BES M30MM-NSC30F-S04K
BES M30MM-NOC30F-S04K

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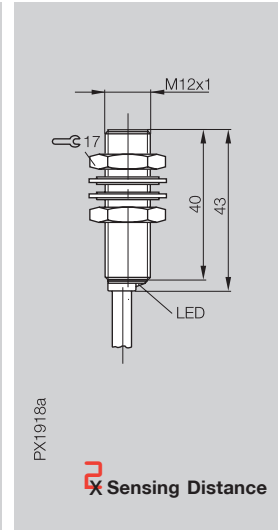
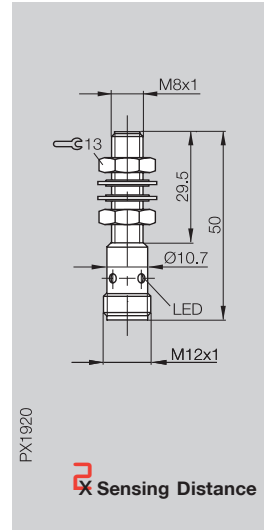
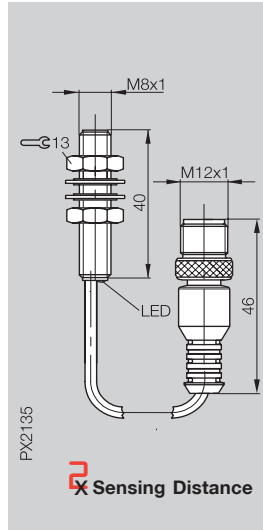
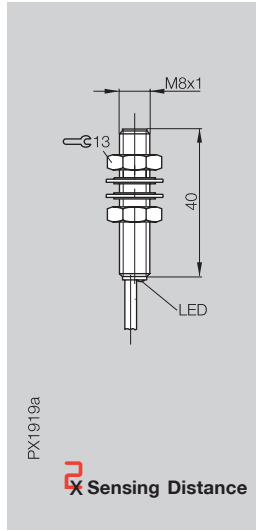
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- Contents
- Selection Charts
- Part Numbers
- Featured
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 - DC 3-Wire
 - DC 2-Wire
 - SteelFace®
 - 2x
 - 3x
 - Fe/NFe
 - Welding
 - Factor 1
 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories

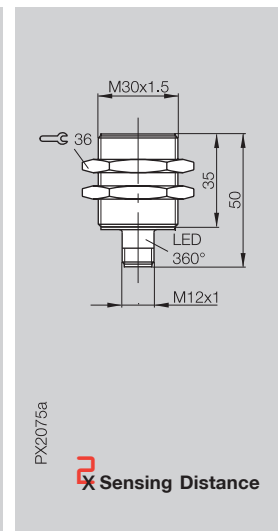
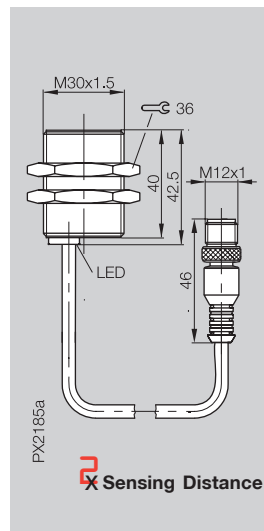
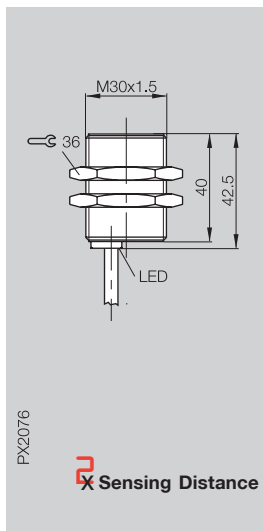
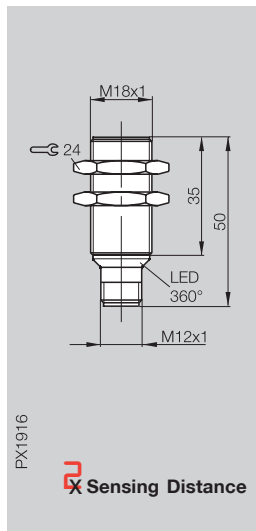
- Standard
 - DC 3-/4-Wire Tubular
 - DC 3-/4-Wire Block
 - AC 2-Wire Tubular
 - AC/DC 2-Wire Tubular
 - AC/DC 2-Wire Block
 - DC 2-Wire Tubular
 - DC 2-Wire Block
- Specialty
 - SuperShorties™
 - Proxinox®
 - High Temp
 - Analog
 - Large Housing
 - Ring Sensor

Housing Size	M8x1	M8x1	M8x1	M12x1
Mounting	flush	flush	flush	flush
Rated Operating Distance s_n	2 mm	2 mm	2 mm	3 mm
Assured Operating Distance s_a	0...1.6 mm	0...1.6 mm	0...1.6 mm	0...2.4 mm



NO Polarized	BES M08MG-GSC20B-BV03	BES M08MG-GSC20B-BP00,3-GS04	BES M08ME1-GSC20B-S04G	BES M12MG-GSC30B-BV03
NO Non-Polarized	BES M08MG-USC20B-BV03		BES M08ME1-USC20B-S04G	BES M12MG-USC30B-BV03
Detailed Specifications	p. 1.126	p. 1.127	p. 1.127	p. 1.128

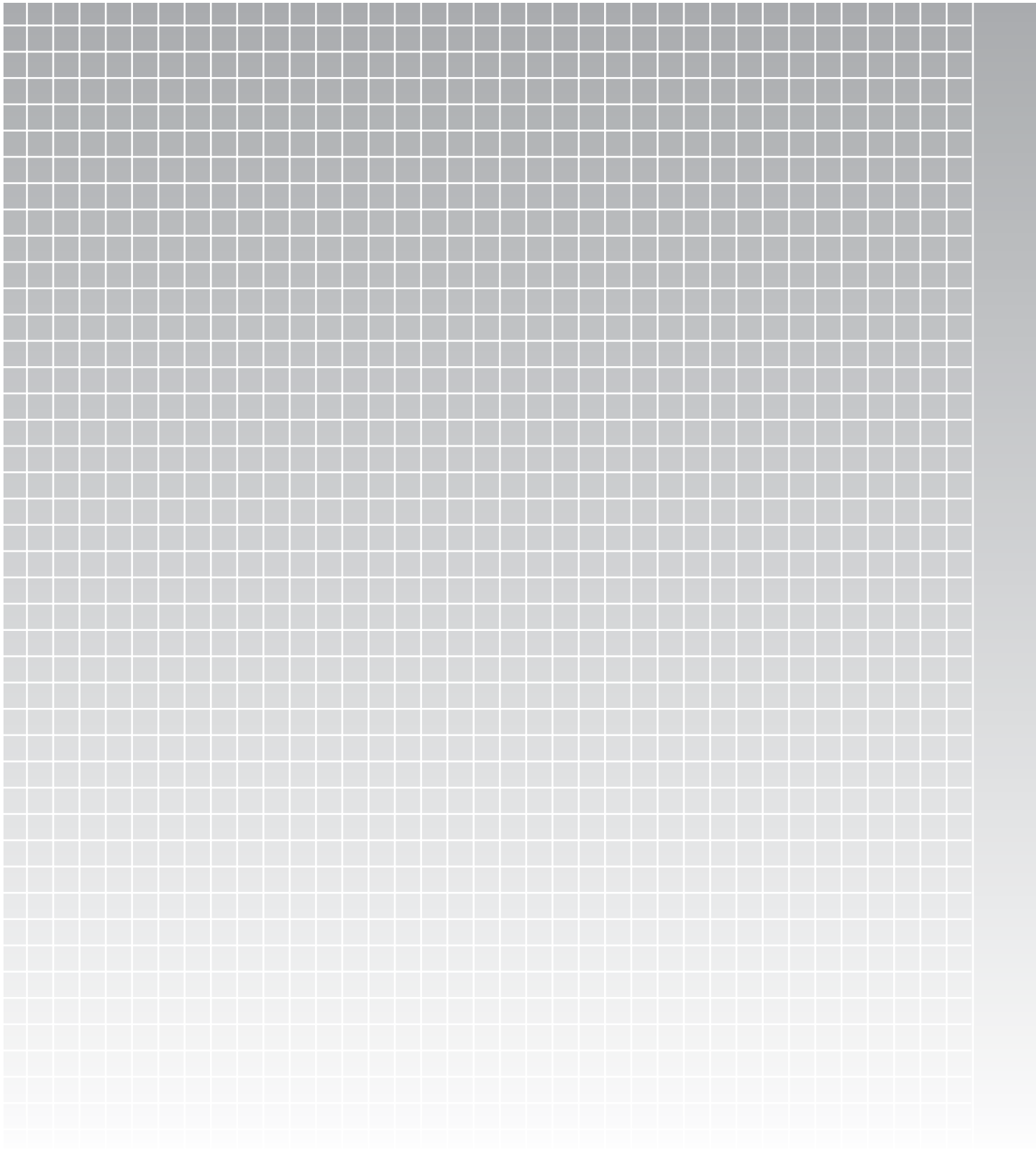
Housing Size	M18x1	M30x1.5	M30x1.5	M30x1.5
Mounting	flush	flush	flush	flush
Rated Operating Distance s_n	7 mm	15 mm	15 mm	15 mm
Assured Operating Distance s_a	0...5.7 mm	0...12.2 mm	0...12.2 mm	0...12.2 mm

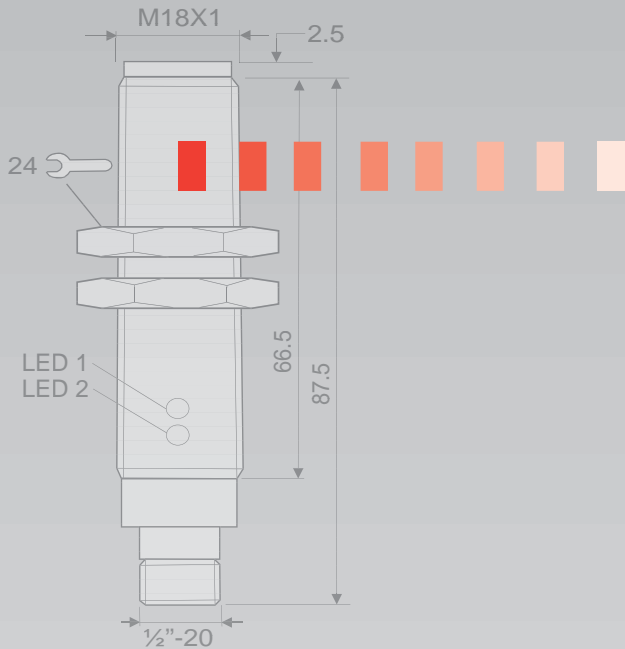


NO Polarized	BES M18MF-GSC70B-S04K	BES M30MF-GSC15B-BV03	BES M30MF-GSC15B-BP00,3-GS04	BES M30MF-GSC15B-S04K
NO Non-Polarized	BES M18MF-USC70B-S04K	BES M30MF-USC15B-BV03		BES M30MF-USC15B-S04K
Detailed Specifications	p.1.131-1.132	p. 1.133	p. 1.134	p. 1.134

M12x1 flush 3 mm 0...2.4 mm	M12x1 flush 3 mm 0...2.4 mm	M18x1 flush 7 mm 0...5.7 mm	M18x1 flush 7 mm 0...5.7 mm
<p>PX2032a X Sensing Distance</p>	<p>PX1921a X Sensing Distance</p>	<p>PX1917 X Sensing Distance</p>	<p>PX2033a X Sensing Distance</p>
BES M12MG-GSC30B-BP00,3-GS04	BES M12MF-GSC30B-S04G BES M12MF-USC30B-S04G	BES M18MG-GSC70B-BV03 BES M18MG-USC70B-BV03	BES M18MG-GSC70B-BP00,3-GS04
p. 1.129	p. 1.129	p. 1.131	p. 1.131







Rugged Sensors for Tough Applications

For error-proofing and part-present applications in heavy manufacturing, inductive sensors are often (by necessity) placed directly in harm's way. Impact, abrasion, and particulate erosion can destroy conventional plastic-faced sensors and their thin metal bodies. Balluff SteelFace® sensors are designed and built tough to survive longer in your most abusive applications. Machined from solid stainless steel bar stock, SteelFace sensors can extend life expectancy where blunt impact, abrasion, and erosion quickly bring standard sensors to their knees. Balluff SteelFace sensors are available in 1X standard range and 2X or 3X extended range, along with special variants like PTFE-coated housings to repel weld spatter, and ferrous- or non-ferrous-selective electronics.

- 1.22** 2x Sensing Distance
- 1.23** 3x Sensing Distance
- 1.25** Ferrous/Non-ferrous Sensing

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GlobalProx®
– DC 3-Wire
– DC 2-Wire
SteelFace®
– 2x
– 3x
– Fe/NFe
Welding
– Factor 1
– Weld Field Immune
– SlagMaster®
– Welding Accessories

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
DC 2-Wire Block

Specialty
SuperShorties™
Proxinox®
High Temp
Analog
Large Housing
Ring Sensor

6	Connectors
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7	Accessories
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o	Product Overview
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t	Technical Reference
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p	Part Number Index
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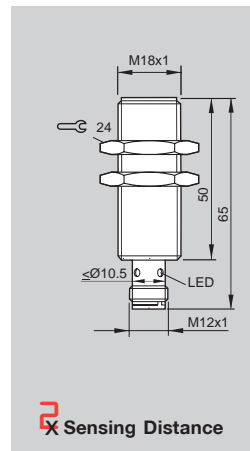
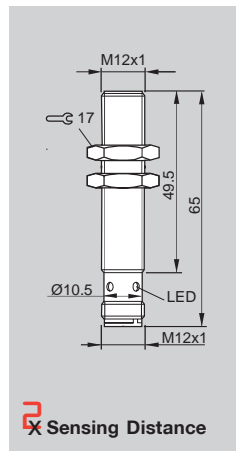
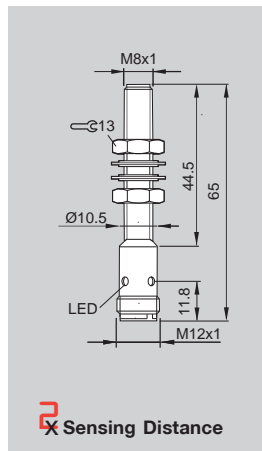
SteelFace® 2X flush mount extended range sensors

These are Balluff's newest addition to our SteelFace® family. Our 2X models provide extended range performance at a very cost effective price. We're confident these models offer the best performance/value ratio in the market.

Features:

- 2X sensing range provides additional sensing performance to increase standoff distance
- Rugged one piece stainless steel face and body
- Resistant to aggressive coolants and lubricants
- Stainless Steel design provides a more rugged housing for increased life in harsh environments
- Marine grade 316L face and body are ideal for food and beverage applications
- Flush mountable in steel with little to no reduction in sensing distance
- Available with PTFE coated bodies for welding applications

Housing Size	M8x1	M12x1	M18x1
Mounting	flush*	flush*	flush*
Rated Operating Distance s _n	2mm	4 mm	7.2 mm
Assured Operating Distance S _a	0...1.6 mm	0...3.2 mm	0...5.8 mm



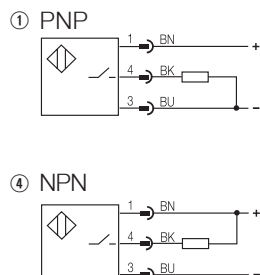
	PNP Normally-open ①	BES M08EH1-PSC20B-S04G-S	BES M12EI-PSC40B-S04G-S	BES M18EI-PSC72B-S04G-S
	PNP Normally-open PTFE ①	BES M08EH1-PSC20B-S04G-S01	BES M12EI-PSC40B-S04G-S01	BES M18EI-PSC72B-S04G-S01
	NPN Normally-open ④	BES M08EH1-NSC20B-S04G-S	BES M12EI-NSC40B-S04G-S	BES M18EI-NSC72B-S04G-S
	NPN Normally-open PTFE ④	BES M08EH1-NSC20B-S04G-S01	BES M12EI-NSC40B-S04G-S01	BES M18EI-NSC72B-S04G-S01
Rated Operational Voltage U _e		24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B		10...30 Vdc	10...30 Vdc	10...30 Vdc
Voltage Drop U _d at I _e		≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
Rated Insulation Voltage U _i		75 Vdc	75 Vdc	75 Vdc
Rated Operational Current I _e		200 mA	200 mA	200 mA
Off-state Current I _r		≤ 10 μA	≤ 10 μA	≤ 10 μA
Protected Against Polarity Reversal		yes	yes	yes
Short Circuit Protected		yes	yes	yes
Repeat Accuracy R		≤ 5 %	≤ 5 %	≤ 5 %
Ambient Temperature Range T _a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Operating Frequency f		750 Hz	500 Hz	250 Hz
Function Indication		yes	yes	yes
Degree of Protection per IEC 60529		IP 67	IP 67	IP 67
Housing Material		stainless steel 316 L	stainless steel 316 L	stainless steel 316 L
Material of Sensing Face		stainless steel 316 L	stainless steel 316 L	stainless steel 316 L
Connection		connector	connector	connector
Recommended Connector		C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M
Pressure Rated to		80 bar (1,160 psi)	60 bar (870 psi)	40 bar (580 psi)

Accessories:

- Steel Bunker Block® II (page 7.10)
- Steel Prox Mounts (page 7.9)

* See technical section (page t.14) for detailed mounting information for 2x and 3x SteelFace® sensors.

Wiring Diagrams



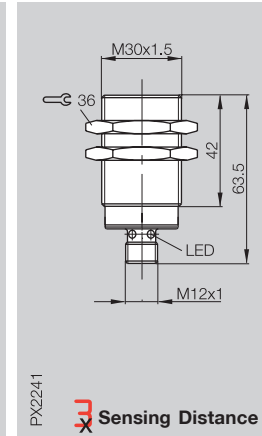
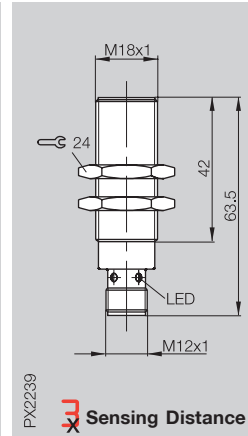
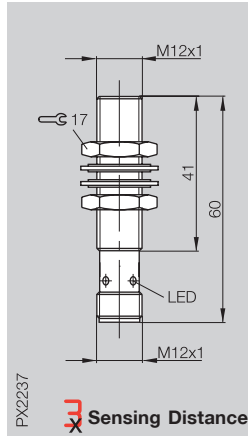
SteelFace® 3X quasi-flush mount extended range sensors

For applications where the ruggedness of a SteelFace sensor are desired in combination with extra long sensing range, Balluff's 3X extended range SteelFace® sensors are a great choice.

Features:

- 3X sensing range provides the longest range available in the market today
- Rugged one piece stainless steel face and body
- Detect all metals at virtually the same sensing distance
- Although quasi-flush, these models are flush mountable with a decreased sensing range

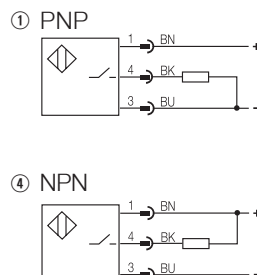
Housing Size	M12x1	M18x1	M30x1
Mounting	quasi-flush*	quasi-flush*	quasi-flush*
Rated Operating Distance s _n	6 mm	10 mm	20 mm
Assured Operating Distance s _a	0...4.9 mm	0...8.1 mm	0...16.2 mm



PNP Normally-open ①	BES M12EG1-PSC60Z-S04G-S11	BES M18EG1-PSC10Z-S04G-S11	BES M30EG1-PSC20Z-S04G-S11
NPN Normally-open ④	BES M12EG1-NSC60Z-S04G-S11	BES M18EG1-NSC10Z-S04G-S11	
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	10...30 Vdc
Voltage Drop U _d at I _e	≤ 2 V	≤ 2 V	≤ 2 V
Rated Insulation Voltage U _i	75 Vdc	75 Vdc	75 Vdc
Rated Operational Current I _e	200 mA	200 mA	200 mA
Off-state Current I _r	≤ 100 μA	≤ 100 μA	≤ 100 μA
Protected Against Polarity Reversal	yes	yes	yes
Short Circuit Protected	yes	yes	yes
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	200 Hz	200 Hz
Function Indication (flashes between s _a max. and s _n)	yes	yes	yes
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67
Housing Material	stainless steel 303	stainless steel 303	stainless steel 303
Material of Sensing Face	stainless steel 303	stainless steel 303	stainless steel 303
Connection	connector	connector	connector
Recommended Connector	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M
Pressure Rated to	80 bar (1,160 psi)	60 bar (870 psi)	40 bar (580 psi)

* See technical section (page t.14) for detailed mounting information for 2x and 3x SteelFace® sensors.

Wiring Diagrams



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- Selection Charts
- Part Numbers
- Featured

GlobalProx®
- DC 3-Wire
- DC 2-Wire

SteelFace®
- 2x
- 3x
- Fe/NFe

Welding
- Factor 1
- Weld Field Immune
- SlagMaster®
- Welding Accessories

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
- DC 2-Wire Block

Specialty

- SuperShorties™
- Proxinox®
- High Temp
- Analog
- Large Housing
- Ring Sensor

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p Part Number Index

SteelFace® 3X non-flush mount extended range sensors

Balluff's 3X non-flush Steelface® sensors offer the longest sensing ranges available in a metal faced sensor. These can withstand abusive environments while providing sensing ranges far beyond standard proximity sensors.

Features:

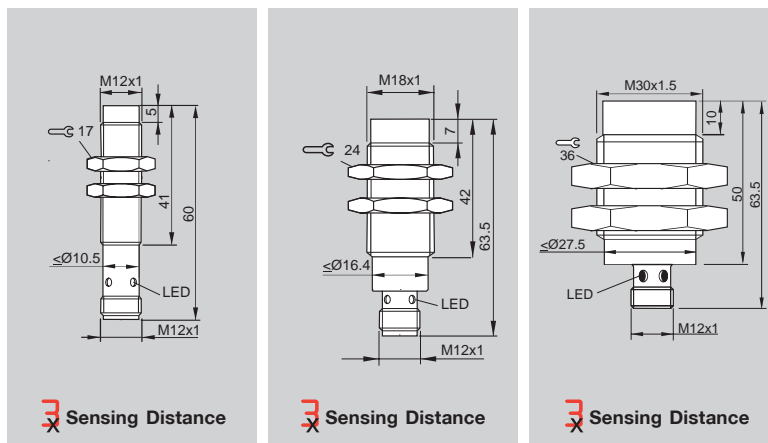
- 3X non-flush sensing range provides ample sensing distance for a multitude of applications

- One piece stainless steel face and body for increased sensor life

- Detect all metals at virtually the same sensing distance

- Non-flush design provides the longest tubular sensing ranges in the market

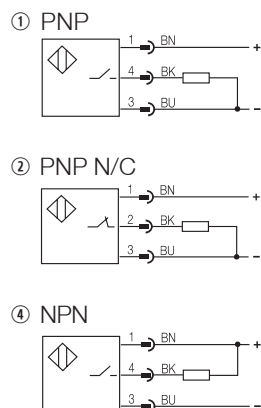
Housing Size	M12x1	M18x1	M30x1
Mounting	non-flush	non-flush	non-flush
Rated Operating Distance s_n	10 mm	20 mm	40 mm
Assured Operating Distance s_a	0...8 mm	0...16 mm	0...32 mm



PNP Normally-open ①	BES M12EF1-PSC10F-S04G-S	BES M18EF1-PSC20F-S04G-S	BES M30EE1-PSC40F-S04G-S
NPN Normally-open ④	BES M12EF1-NSC10F-S04G-S	BES M18EF1-NSC20F-S04G-S	BES M30EE1-NSC40F-S04G-S
Rated Operational Voltage U_e	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U_B	10...30 Vdc	10...30 Vdc	10...30 Vdc
Voltage Drop U_d at I_e	≤ 2 V	≤ 2 V	≤ 2 V
Rated Insulation Voltage U_i	75 Vdc	75 Vdc	75 Vdc
Rated Operational Current I_e	200 mA	200 mA	200 mA
Off-state Current I_r	$\leq 100 \mu A$	$\leq 100 \mu A$	$\leq 100 \mu A$
Protected Against Polarity Reversal	yes	yes	yes
Short Circuit Protected	yes	yes	yes
Repeat Accuracy R	$\leq 5 \%$	$\leq 5 \%$	$\leq 5 \%$
Ambient Temperature Range T_a	-25...+70 °C	-25...+70 °C	-25...+70 °C
Operating Frequency f	350 Hz	150 Hz	100 Hz
Function Indication (flashes between s_a max. and s_n)	yes	yes	yes
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67
Housing Material	stainless steel 303	stainless steel 303	stainless steel 303
Material of Sensing Face	stainless steel 303	stainless steel 303	stainless steel 303
Connection	connector	connector	connector
Recommended Connector	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M
Pressure Rated to	80 bar (1,160 psi)	60 bar (870 psi)	40 bar (580 psi)

* See technical section (page t.14) for detailed mounting information for 2x and 3x SteelFace® sensors.

Wiring Diagrams

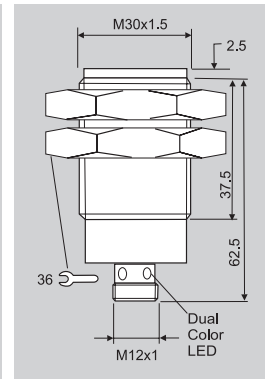
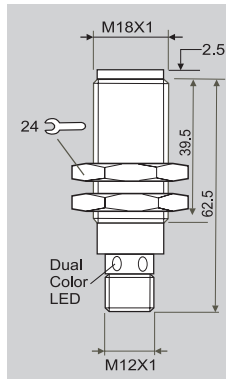
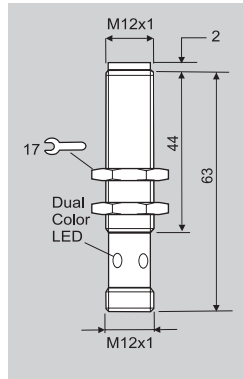
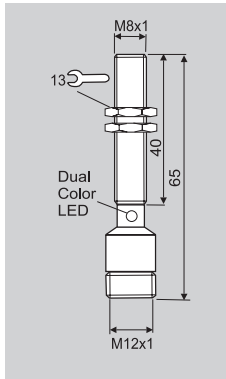


Housing Size	M8 x 1	M12 x 1	M18 x 1	M30 x 1
Mounting	flush	flush	flush	flush
Rated Operating Distance S _n	1.5 mm	2 mm	5 mm	8 mm
Assured Operating Distance S _a	0...1.2 mm	0...1.6 mm	0...4.1 mm	0...6.4 mm

SteelFace® 1X
ferrous and non-ferrous sensors



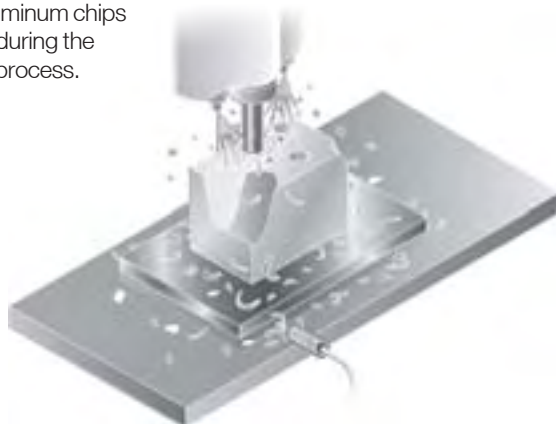
For applications requiring the need for an extremely rugged sensor and the capability to be target selective, these ferrous and non-ferrous sensors fit the need.



PNP Ferrous Normally-open ①	BES M08EG1-PSC15S-S04G-S	BES M12EG1-PSC20S-S04G-S	BES M18EG1-PSC50S-S04G-S	BES M30EG1-PSC80S-S04G-S
PNP Ferrous Normally-closed ②		BES M12EG1-POC20S-S04G-S	BES M18EG1-POC50S-S04G-S	
PNP Non-ferrous Normally-open ①		BES M12EG1-PSC20N-S04G-S	BES M18EG1-PSC50N-S04G-S	BES M30EG1-PSC80N-S04G-S
NPN Ferrous Normally-open ④	BES M08EG1-NSC15S-S04G-S	BES M12EG1-NSC20S-S04G-S	BES M18EG1-NSC50S-S04G-S	BES M30EG1-NSC80S-S04G-S

Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
Voltage Drop U _d at I _e	≤ 2.0 Vdc	≤ 2.0 Vdc	≤ 2.0 Vdc	≤ 2.0 Vdc
Load Current Capacity	100 mA	200 mA	200 mA	200 mA
Current Consumption	≤10 mA	≤10 mA	≤10 mA	≤10 mA
Off-state Current I _r	≤10 uA	≤10 uA	≤10 uA	≤10 uA
Protected Against Polarity Reversal	yes	yes	yes	yes
Short Circuit Protected	yes	yes	yes	yes
Repeat Accuracy R	≤ 2%	≤ 2%	≤ 2%	≤ 2%
Ambient Temperature Range T _a	-25°C...+70°C	-25°C...+70°C	-25°C...+70°C	-25°C...+70°C
Operating Frequency f	20 Hz Ferrous	100 Hz Ferrous/ 15 Hz Nonferrous	15 Hz Ferrous/ 30 Hz Nonferrous	10 Hz Ferrous/ 10 Hz Nonferrous
Power Indication	yes	yes	yes	yes
Output Indication	yes	yes	yes	yes
Degree of Protection per IEC 60529	IP 67/	IP 67/	IP 67/	IP 67/
Housing Material	1200 psi washdown stainless steel 303	1200 psi washdown stainless steel 303	1200 psi washdown stainless steel 303	1200 psi washdown stainless steel 303
Material of Sensing Face	stainless steel 303	stainless steel 303	stainless steel 303	stainless steel 303
Connection	connector	connector	connector	connector
Approvals	cULus	cULus	cULus	cULus
Recommended Connector	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M

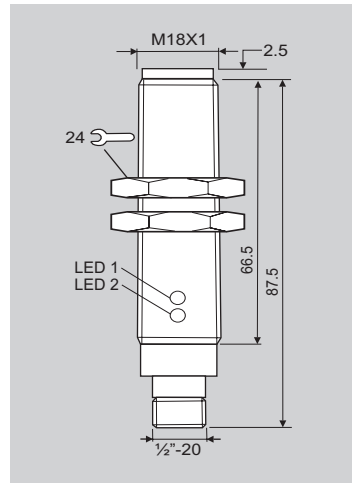
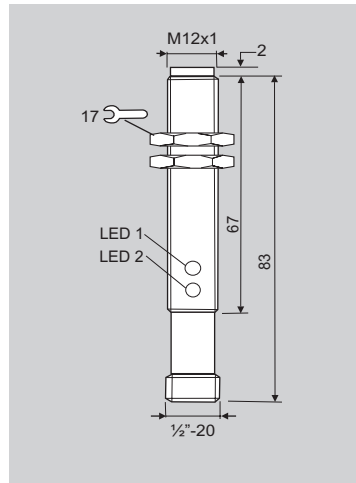
SteelFace® ferrous sensors detect steel parts while ignoring aluminum chips generated during the machining process.



SteelFace® nonferrous sensors will detect the presence of aluminum objects such as an engine block while ignoring the ferrous pallets or fixtures that hold them.



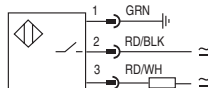
Housing Size	M12 x 1	M18 x 1
Mounting	Flush	Flush
Rated Operating Distance S_n	2 mm	5 mm
Assured Operating Distance S_a	0...1.6 mm	0...4.1 mm



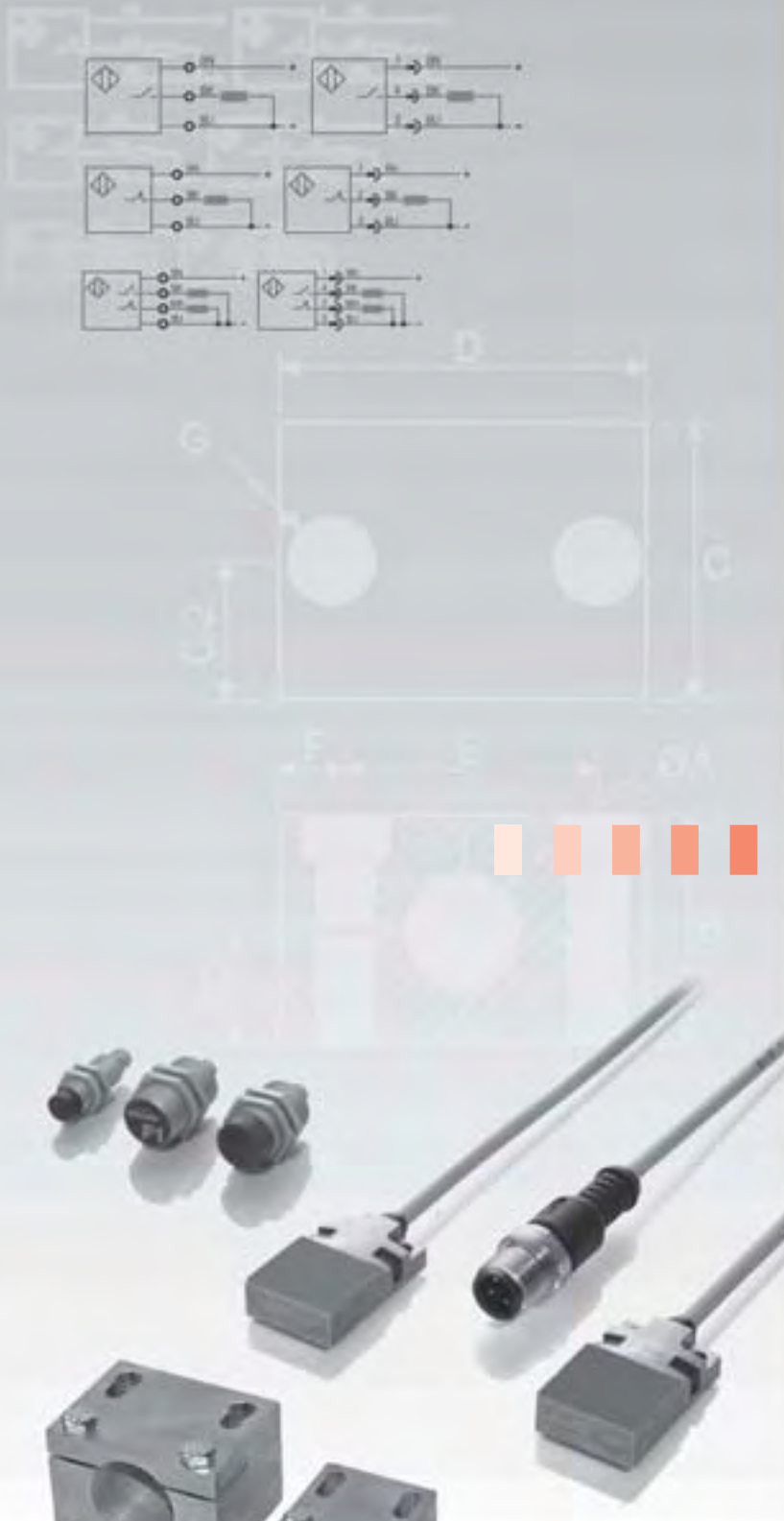
AC/DC Ferrous Normally-open ⑰	BES M12EN1-USU20S-S21G-S	BES M18EP1-USU50S-S21G-S
AC/DC Nonferrous Normally-open ⑰	BES M12EN1-USU20N-S21G-S	BES M18EP1-USU50N-S21G-S
Rated Operational Voltage U_o	110 Vac	110 Vac
Supply Voltage U_B	20...250 Vac/ 20...300 Vdc	20...250 Vac/ 20...300 Vdc
Voltage Drop U_d at I_o	≤ 7.0 V	≤ 7.0 V
Rated Operational Current I_o	200 mA	200 mA
Minimum Operational Current I_m	8 mA	8 mA
Off-state Current I_r	≤ 1.3 mA at 110 Vac	≤ 1.3 mA at 110 Vac
Inrush Current I_k $t = 20$ ms	≤ 1.7 A	≤ 1.7 A
Protected Against Polarity Reversal	yes	yes
Short Circuit Protected	yes	yes
Repeat Accuracy R	$\leq 2\%$	$\leq 2\%$
Ambient Temperature Range T_a	-25°C...+70°C	-25°C...+70°C
Operating Frequency f	30 Hz Ferrous/ 15 Hz Nonferrous	15 Hz Ferrous/ 30 Hz Nonferrous
Power Indication	yes	yes
Output Indication	yes	yes
Degree of Protection per IEC 60529	IP 67/1200 psi washdown	IP 67/1200 psi washdown
Housing Material	stainless steel 303	stainless steel 303
Material of Sensing Face	stainless steel 303	stainless steel 303
Connection	connector	connector
Approvals	cULus	cULus
Recommended Connector	C21 AE3-00-VY-150F	C21 AE3-00-VY-150F

Wiring Diagram

⑰ AC/DC N/O w/ Gnd.



Welding Sensors



Inductive Sensors

Welding Sensors Contents

Welding Sensors

Non-contact inductive proximity sensors used to detect clamp status and part presence must operate reliably and survive physically in harsh robotic and manual welding environments. Balluff offers an extensive selection of weld-field immune, anti-slag coated inductive proximity sensors for rigorous MIG and resistance welding applications. Balluff's program of specialized welding sensors and protective accessories counteracts the hostile effects of hot weld slag, strong electromagnetic fields, and mechanical impact to help keep production lines running at peak efficiency.

- 1.29** Factor 1 Sensors
- 1.35** Weld Field Immune Sensors
- 1.41** SlagMaster® Sensors
- 1.47** Weld Accessories

Inductive

1

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 - DC 2-Wire
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 - 2x
 - 3x
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- Welding**
 - Factor 1
 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories

- 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
 - DC 2-Wire Block
- Specialty
 - SuperShorties™
 - Proxinox®
 - High Temp
 - Analog
 - Large Housing
 - Ring Sensor

- 6** Connectors

- 7** Accessories

- o** Product Overview

- t** Technical Reference

- p** Part Number Index

Welding Sensors

Standard inductive proximity sensors are not designed for operation in the presence of strong magnetic fields generated by modern welding processes. Powerful magnetic fields can adversely influence their coil oscillator circuits, causing false sensor lock-on - even when no target is present.

Balluff offers two similar but distinct product families designed to be immune to the influence of strong magnetic fields: Weld Field Immune + Factor 1, and Weld Field Immune.

WELDFIELD Immune + Factor 1

Balluff Weld Field Immune + Factor 1 sensors are inherently weld field immune due to their coreless dual sensing coil design. As an added benefit, these "Factor 1" sensors do not require de-rating (0.6, 0.5, etc.) of the nominal sensing distance when the target is a material other than steel, such as aluminum or brass. However, Balluff Weld Field Immune + Factor 1 sensors are first and foremost welding sensors, so they are all offered with PTFE-coated bodies and LCP+PTFE faces to resist weld slag accumulation. They are also optionally available with SlagMaster® ceramic-based coating on the active surface to further prolong sensor functionality in the presence of hot weld spatter (see below).

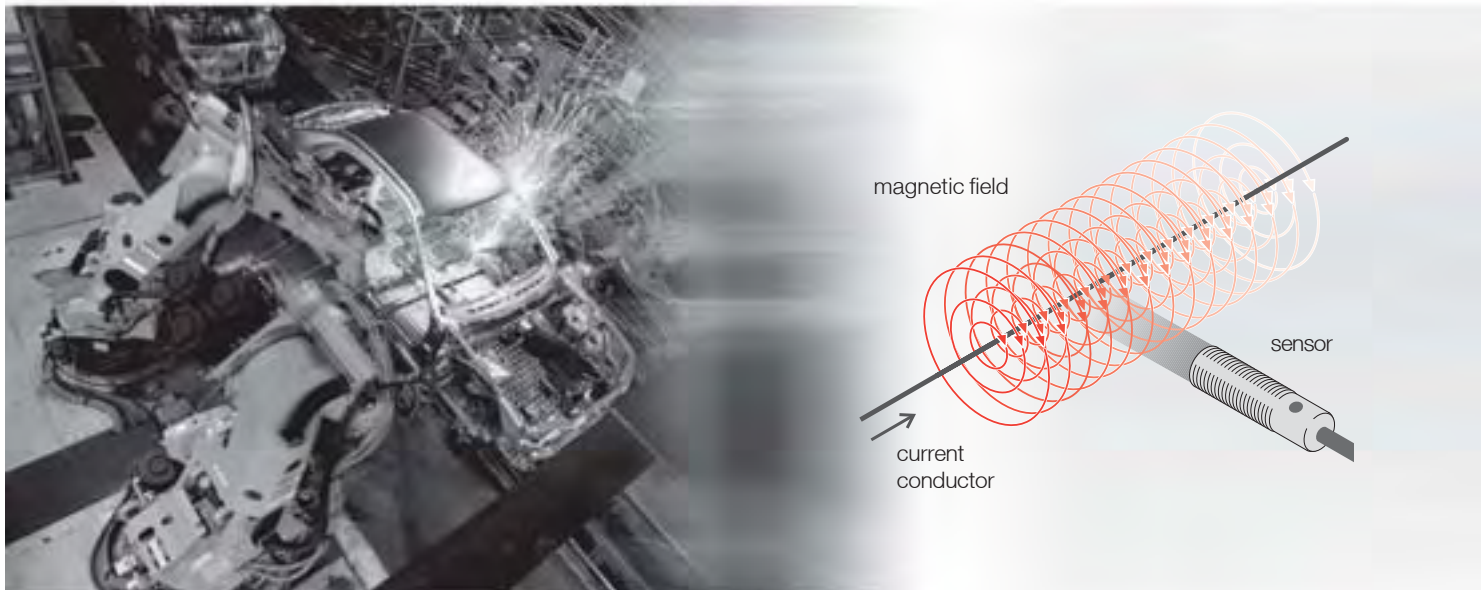


WELD FIELD Immune

Balluff Weld Field Immune (non-Factor 1) sensors are designed with special filtering and robust detector circuits that enable them to withstand the influence of strong magnetic fields. They are all offered with PTFE-coated bodies and pure PTFE faces to resist weld slag accumulation. They are also optionally available with SlagMaster® ceramic-based coating on the active surface to further prolong sensor functionality in the presence of hot weld spatter (see below).

SlagMaster®

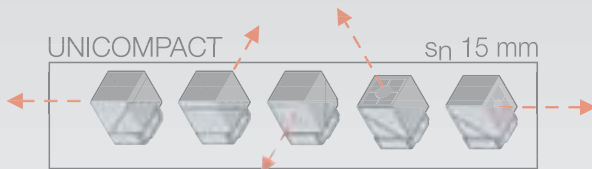
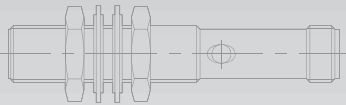
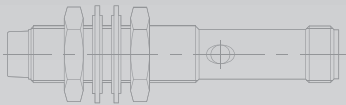
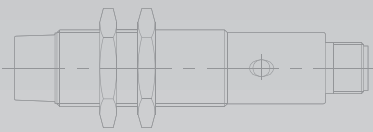
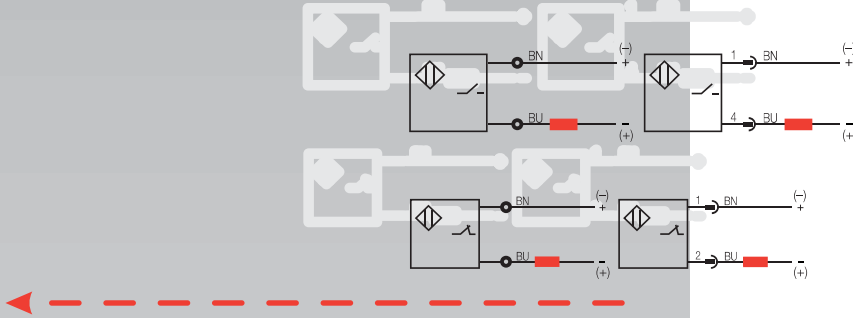
SlagMaster® is a proprietary ceramic-based protective coating that is factory-applied over the sensing face. By resisting the effects of continuous hot weld spatter, SlagMaster prolongs sensor life by resisting the melting and erosion of the sensor face. It also enhances sensor reliability by repelling weld berries that could become embedded into the sensor face and cause the sensor to lock on.



Weld Field Immune + Factor 1 Sensors

Balluff Weld Field Immune + Factor 1 sensors are inherently weld field immune due to their coreless dual sensing coil design. As an added benefit, these “Factor 1” sensors do not require de-rating (0.6, 0.5, etc.) of the nominal sensing distance when the target is a material other than steel, such as aluminum or brass. However, Balluff Weld Field Immune + Factor 1 sensors are first and foremost welding sensors, so they are all offered with PTFE-coated bodies and LCP+PTFE faces to resist weld slag accumulation. They are also optionally available with SlagMaster® ceramic-based coating on the active surface to further prolong sensor functionality in the presence of hot weld spatter.

- 1.30** DC 3-/4-Wire M12
- 1.31** DC 3-/4-Wire M18
- 1.32** DC 3-/4-Wire M30
- 1.33** DC 3-/4-Wire Unicomcompact



- Contents
- Selection Charts
- Part Numbers
- Featured
 - GlobalProx®
 - DC 3-Wire
 - DC 2-Wire
 - SteelFace®
 - 2x
 - 3x
 - Fe/NFe
 - Welding
 - Factor 1
 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories

- 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
 - DC 2-Wire Block
- Specialty
 - SuperShorties™
 - Proxinox®
 - High Temp
 - Analog
 - Large Housing
 - Ring Sensor

6 Connectors

7 Accessories

o Product Overview

t Technical Reference

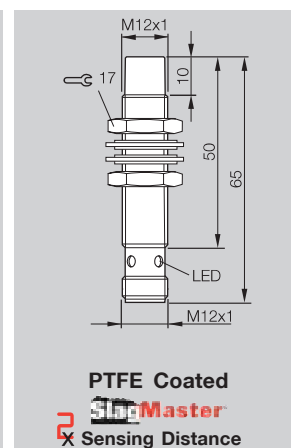
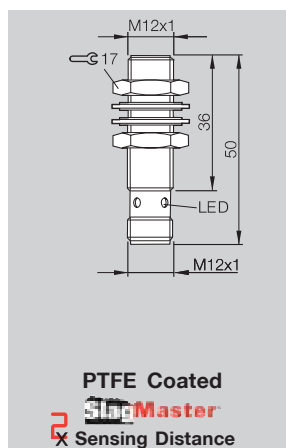
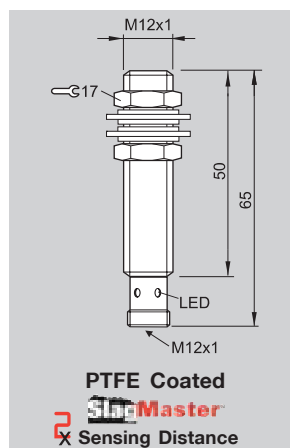
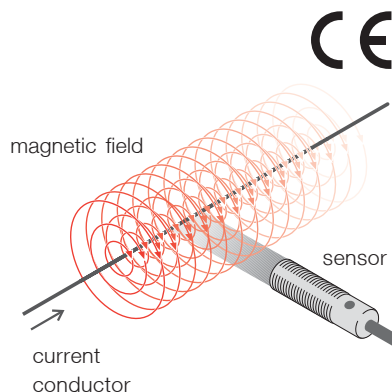
p Part Number Index

Inductive Sensors

DC 3-Wire
M12
s_n 3 mm, 8 mm

Welding Sensors Factor 1

Housing Size	M12x1	M12x1	M12x1
Mounting	flush*	flush*	non-flush*
Rated Operating Distance s _n	3 mm	3 mm	8 mm
Assured Operating Distance s _a	0...2.4 mm	0...2.4 mm	0...6.5 mm

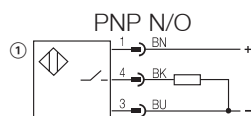


PNP SlagMaster® Normally-open ①	BES M12ML-PSC30A-S04G-W01	BES M12MF1-PSC30A-S04G-W01	BES M12ML-PSC80E-S04G-W01
PNP Normally-open ①	BES M12ML-PSC30A-S04G-W	BES M12MF1-PSC30A-S04G-W	BES M12ML-PSC80E-S04G-W
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	10...30 Vdc
Voltage Drop U _d at I _e	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
Rated Insulation Voltage U _i	75 Vdc	250 Vac	250 Vac
Rate Operational Current I _e	200 mA	200 mA	200 mA
Current Consumption (closed/open)	≤ 17 mA/≤ 10 mA	≤ 15 mA	≤ 15 mA
Off-state Current I _r	≤ 30 μA	≤ 80 μA	≤ 80 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	4000 Hz	2000 Hz	2000 Hz
Function Indication	yes	yes	yes
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67
Housing Material	PTFE coated brass	PTFE coated brass	PTFE coated brass
Material of Sensing Face	ceramic coated/LCP	ceramic coated/LCP	ceramic coated/LCP
Connection	connector	connector	connector
Approvals	cULus	cULus	cULus
Recommended Connector	C04 AEL-00-TY-050M	C04 AEL-00-TY-050M	C04 AEL-00-TY-050M

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

For more information on SlagMaster®, see page 1.41.

Wiring Diagram



M12x1 non-flush*	M18x1 flush	M18x1 flush	M18x1 non-flush*
8 mm	5 mm	5 mm	12 mm
0...6.5 mm	0...4 mm	0...4 mm	0...9.7 mm
PTFE Coated Sensing Distance	PTFE Coated 	PTFE Coated 	PTFE Coated Sensing Distance
BESM12MD1-PSC80E-S04G-W01 BESM12MDI-PSC80E-S04G-W	BES M18ML-PSC50A-S04G-W01 BES M18ML-PSC50A-S04G-W	BES M18MF1-PSC50A-S04G-W01 BES M18MF1-PSC50A-S04G-W	BES M18ML-PSC12E-S04G-W01 BES M18ML-PSC12E-S04G-W
24 Vdc	24 Vdc	24 Vdc	24 Vdc
10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
≤ 2.5 V	≤ 2.0 V	≤ 2.5 V	≤ 2.5 V
250 Vac	250 Vac	250 Vac	250 Vac
200 mA	200 mA	200 mA	200 mA
≤ 15 mA	≤ 15 mA/≤ 10 mA	≤ 15 mA/≤ 10 mA	≤ 17 mA/≤ 10 mA
≤ 80 μA	≤ 80 μA	≤ 80 μA	≤ 80 μA
yes	yes	yes	yes
yes	yes	yes	yes
≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF
≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
2000 Hz	600 Hz	2500 Hz	300 Hz
yes	yes	yes	yes
IP 67	IP 67	IP 67	IP 67
PTFE coated brass ceramic coated/LCP connector	PTFE coated brass ceramic coated/LCP connector	PTFE coated brass ceramic coated/LCP connector	PTFE coated brass ceramic coated/LCP connector
cULus	cULus	cULus	cULus
C04 AEL-00-TY-050M	C04 AEL-00-TY-050M	C04 AEL-00-TY-050M	C04 AEL-00-TY-050M

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

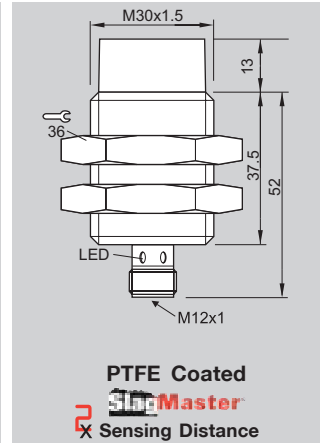
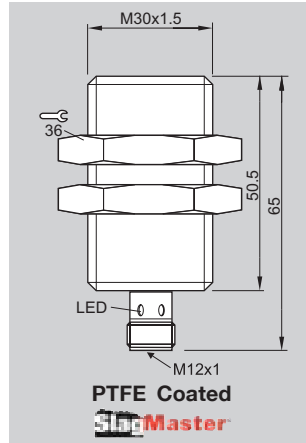
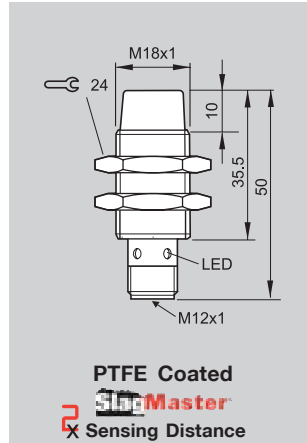
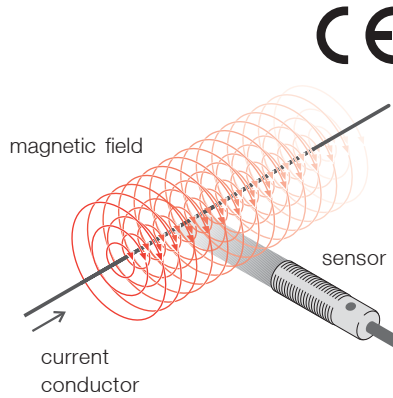


Inductive Sensors

DC 3-/4-Wire
M18, M30
s_n 10 mm, 12 mm, 20 mm

Welding Sensors Factor 1

Housing Size	M18x1	M30x1	M30x1
Mounting	non-flush*	flush	non-flush*
Rated Operating Distance s _n	12 mm	10 mm	20 mm
Assured Operating Distance s _a	0...9.7 mm	0...8.1 mm	0...16 mm



PNP SlagMaster® Normally-open ①	BES M18MD-PSC12E-S04G-W01	BES M30ML-PSC10A-S04G-W01	BES M30ML-PSC20E-S04G-W01
PNP SlagMaster® Complementary ③			
PNP Normally-open ①	BES M18MD-PSC12E-S04G-W	BES M30ML-PSC10A-S04G-W	BES M30ML-PSC20E-S04G-W
PNP Complementary ③			

Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	10...30 Vdc
Voltage Drop U _d at I _e	< 2.5 V	< 2.0 V	< 2.0 V
Rated Insulation Voltage U _i	250 Vac	250 Vac	250 Vac
Rated Operational Current I _e	200 mA	200 mA	200 mA
Current Consumption (closed/open)	≤ 15 mA/10 mA	≤ 17 mA/≤ 10 mA	≤ 17 mA/≤ 10 mA
Off-state Current I _r	≤ 80 μA	≤ 80 μA	≤ 80 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

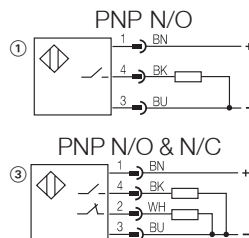
Repeat Accuracy R	≤ 5 %	≤ 5 %	≤ 5 %
Ambient Temperature Range T _a	-25...+70 °C	-25...+70 °C	-25...+70 °C
Operating Frequency f	2500 Hz	600 Hz	1000 Hz
Function Indication/Power Indication	yes/no	yes/no	yes/no

Degree of Protection per IEC 60529	IP 67	IP 67	IP 67
Housing Material	PTFE coated brass	PTFE coated brass	PTFE coated brass
Material of Sensing Face	ceramic coated/LCP	ceramic coated/LCP	ceramic coated/LCP
Connection	connector	connector	connector
Approvals	cULus	cULus	cULus
Recommended Connector	C04 AEL-00-TY-050M	C04 AEL-00-TY-050M	C04 AEL-00-TY-050M

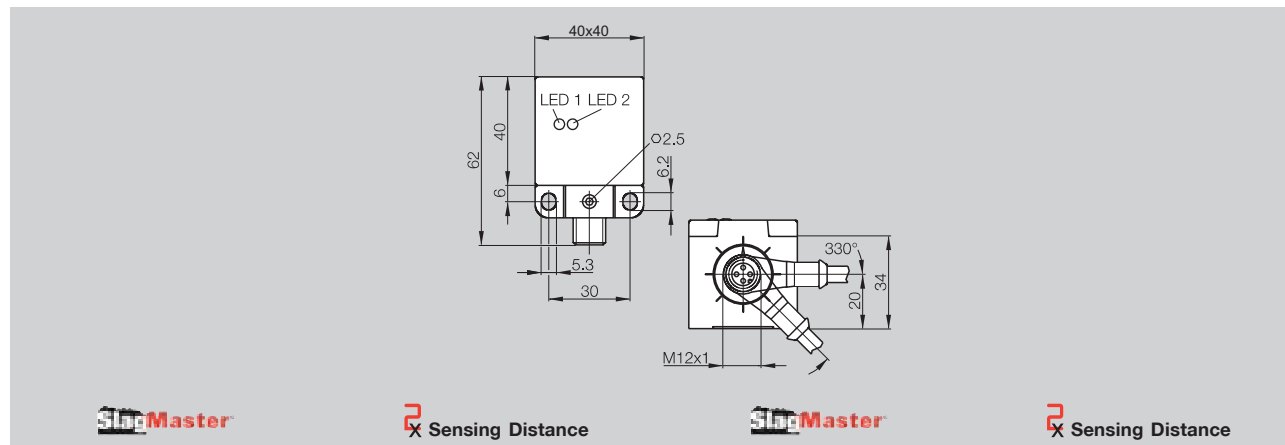
* See technical section for proper mounting of the 2x, 3x, and 4x long range sensors.

For more information on SlagMaster®, see page 1.41.

Wiring Diagrams



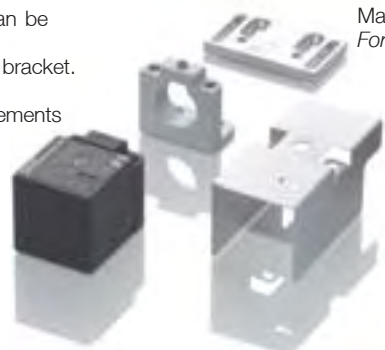
40x40x62	40x40x62	40x40x62	40x40x62
flush	flush	non-flush	non-flush
15 mm	20 mm	35 mm	40 mm
0...12.2 mm	0...16 mm	0...28.4 mm	0...32.4 mm



BES Q40KFU-PSC15A-S04G-W01		BES Q40KFU-PSC35E-S04G-W01	
BES Q40KFU-PAC15A-S04G-W01		BES Q40KFU-PAC35E-S04G-W01	
BES Q40KFU-PSC15A-S04G	BES Q40KFU-PSC20A-S04G	BES Q40KFU-PSC35E-S04G	BES Q40KFU-PAC40E-S04G
BES Q40KFU-PAC15A-S04G	BES Q40KFU-PAC20A-S04G	BES Q40KFU-PAC35E-S04G	
24 Vdc	24 Vdc	24 Vdc	24 Vdc
10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
≤ 2.5 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
250 Vac	250 Vac	250 Vac	250 Vac
200 mA	200 mA	200 mA	200 mA
≤ 25 mA	≤ 20 mA	≤ 25 mA	≤ 25 mA
≤ 80 µA	≤ 80 µA	≤ 80 µA	≤ 80 µA
yes	yes	yes	yes
yes	yes	yes	yes
≤ 1.0 µF	≤ 1.0 µF	≤ 1.0 µF	≤ 1.0 µF
≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
-25...+70 °C	-25...+70 °C	-10...+70 °C	-10...+70 °C
400 Hz	400 Hz	200 Hz	100 Hz
yes/yes	yes/yes	yes/yes	yes/yes
IP 67	IP 67	IP 67	IP 67
PBT	PBTP	PBT	PBT
ceramic coated/PBT	PBTP	ceramic coated/PBT	PBT
connector	connector	connector	connector
cULus	cULus	cULus	cULus
C04 AEL-00-TY-050M	C04 AEL-00-TY-050M	C04 AEL-00-TY-050M	C04 AEL-00-TY-050M

For mounting information see technical section page t.15
For more information on SlagMaster®, see page 1.41.

Mounting Bracket
BES Q40-HW-2
Metal bracket can be used in place of standard plastic bracket. Please consider mounting requirements when using.

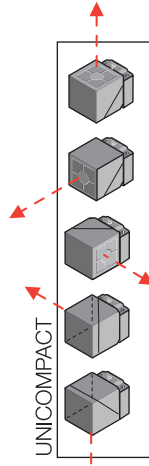


Mounting Bracket
BES Q40-SH-1
Material: Metal
For use with BES Q40KFU-...A-..

Mounting Bracket
BES Q40-HW-1
Material: Aluminum



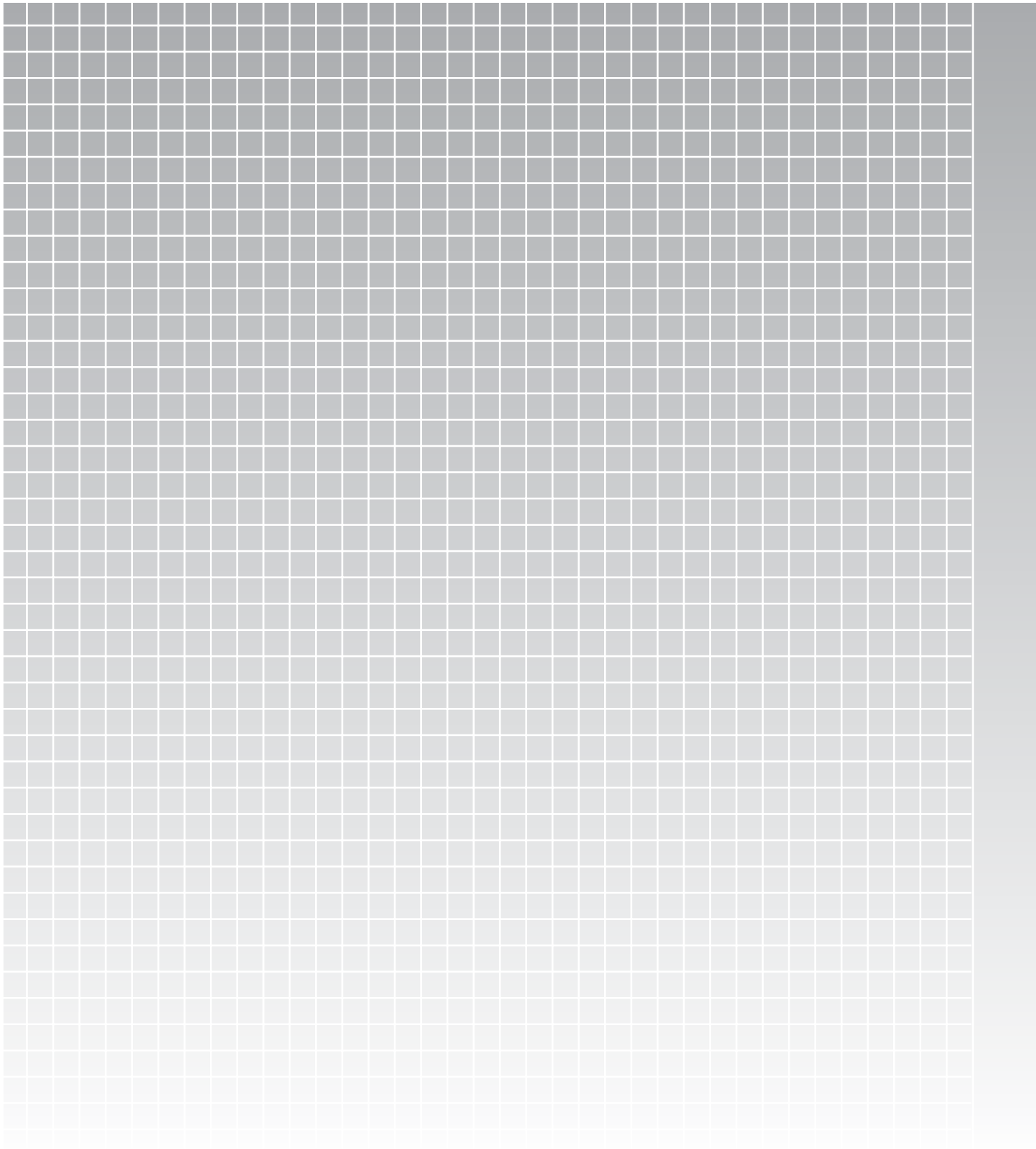
Protection Cap
BES Q40-SH-2
Material: PA 6

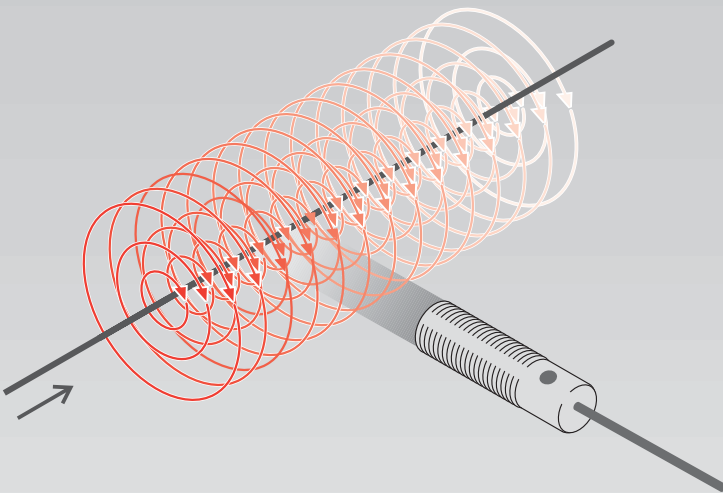
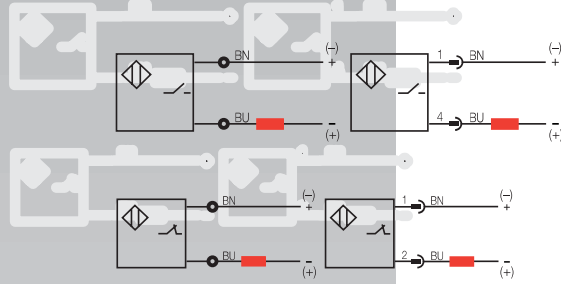


Inductive

1

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- Selection Charts
- Part Numbers
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– DC 3-Wire
– DC 2-Wire
- SteelFace®
– 2x
– 3x
– Fe/NFe
- Welding**
– **Factor 1**
– Weld Field Immune
– SlagMaster®
– Welding Accessories
- Standard
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- DC 3-/4-Wire Block
- AC 2-Wire Tubular
- AC/DC 2-Wire Tubular
- AC/DC 2-Wire Block
- DC 2-Wire Tubular
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Weld Field Immune Sensors

Balluff Weld Field Immune (non-Factor 1) sensors are designed with special filtering and robust detector circuits that enable them to withstand the influence of strong magnetic fields. They are all offered with PTFE-coated bodies and pure PTFE faces to resist weld slag accumulation. They are also optionally available with SlagMaster® ceramic-based coating on the active surface to further prolong sensor functionality in the presence of hot weld spatter.

- 1.36 DC 3-/4-Wire M12
- 1.37 DC 3-/4-Wire M18, M30
- 1.38 DC 3-/4-Wire Block
- 1.39 AC/DC 2-Wire M18, M30

Contents

Selection Charts

Part Numbers

Featured

GlobalProx®
– DC 3-Wire
– DC 2-Wire

SteelFace®
– 2x
– 3x
– Fe/NFe

Welding
– **Factor 1**
– Weld Field Immune
– SlagMaster®
– Welding Accessories

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

DC 2-Wire Block

Specialty

SuperShorties™
Proxinox®
High Temp
Analog
Large Housing
Ring Sensor

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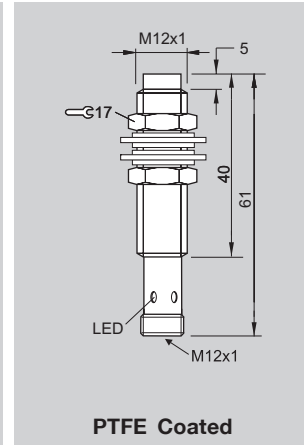
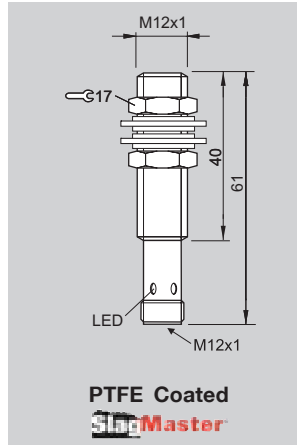
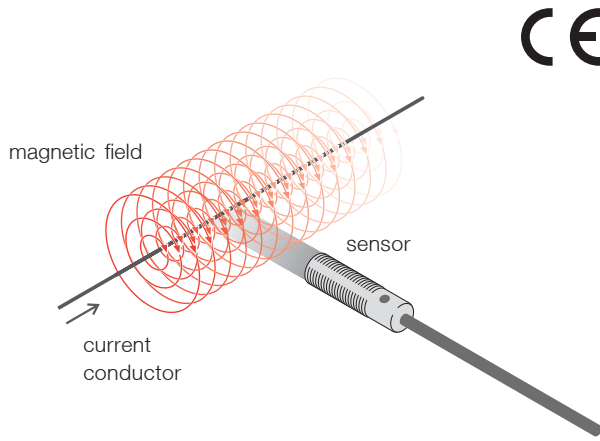
Inductive Sensors

DC 3-/4-Wire
M12
S_n 2 mm, 4 mm

Welding Sensors

WELDFIELD Immune

Housing Size	M12x1	M12x1
Mounting	flush	non-flush
Rated Operating Distance s _n	2 mm	4 mm
Assured Operating Distance s _a	0...1.6 mm	0...3.2 mm



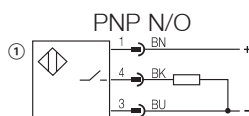
PNP	SlagMaster®	Normally-open ①	BES 516-325-SA96-S4-W	
PNP		Normally-open ①	BES 516-325-S4-W	BES 516-356-S4-W
Rated Operational Voltage U _e			24 Vdc	24 Vdc
Supply Voltage U _B			10...30 Vdc	10...30 Vdc
Voltage Drop U _d at I _e			≤ 2.5 V	≤ 2.5 V
Rated Insulation Voltage U _i			75 Vdc	75 Vdc
Load Current Capacity			200 mA	200 mA
No-load Supply Current I ₀ damped/undamped			≤ 20 mA / ≤ 15 mA	≤ 20 mA / ≤ 15 mA
Off-state Current I _r			≤ 80 μA	≤ 80 μA
Protected Against Polarity Reversal			yes	yes
Short Circuit Protected			yes	yes
Load Capacitance			≤ 1.0 μF	≤ 1.0 μF
Repeat Accuracy R			≤ 5 %	≤ 5 %
Ambient Temperature range T _a			-25...+70 °C	-25...+70 °C
Operating Frequency f			1000 Hz	1000 Hz
Function Indication			yes	yes
Degree of Protection per IEC 60529			IP 67	IP 67
Housing Material			PTFE coated brass	PTFE coated brass
Material of Sensing Face			ceramic coated/PTFE	PTFE
Connection			connector	connector
Approvals			cULus	cULus
Recommended Connector			C04 AEL-00-TY-050M	C04 AEL-00-TY-050M

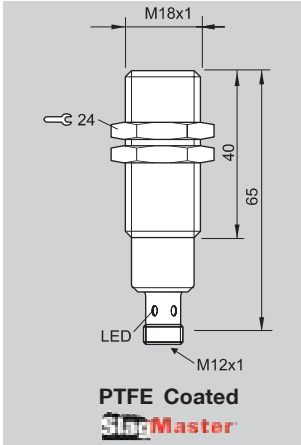
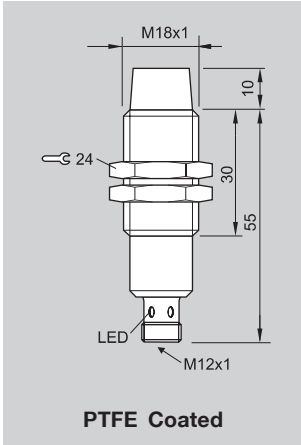
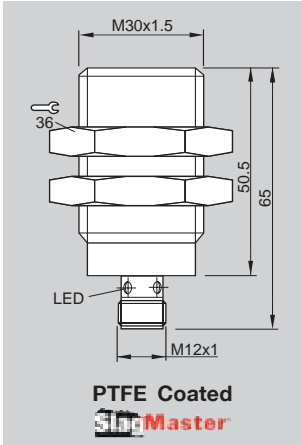
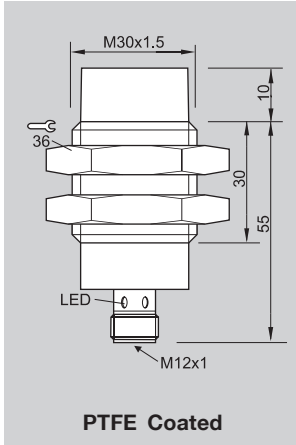
Recommendations:

- Use a TPE mating cable. TPE is ideal for high temperature and weld slag environments.
- PTFE coated prox mounts which resist weld slag are also available. See section 7.

For more information on SlagMaster®, see page 1.41.

Wiring Diagram



M18x1 flush 5 mm 0...4 mm	M18x1 non-flush 8 mm 0...6.4 mm	M30x1.5 flush 10 mm 0...8.1 mm	M30x1.5 non-flush 15 mm 0...12 mm
			
BES 516-326-SA96-S4-W BES 516-326-S4-W	BES 516-360-S4-W	BES 516-327-SA96-S4-W BES 516-327-S4-W	BES 516-362-S4-W
24 Vdc	24 Vdc	24 Vdc	24 Vdc
10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
≤ 2.5 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
75 Vdc	75 Vdc	75 Vdc	75 Vdc
200 mA	200 mA	200 mA	200 mA
≤ 20 mA/≤ 15 mA	≤ 20 mA/≤ 15 mA	≤ 12 mA/≤ 6 mA	≤ 8 mA/≤ 1 mA
≤ 80 µA	≤ 80 µA	≤ 80 µA	≤ 80 µA
yes	yes	yes	yes
yes	yes	yes	yes
≤ 1.0 µF	≤ 1.0 µF	≤ 1.0 µF	≤ 1.0 µF
≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
500 Hz	200 Hz	100 Hz	100 Hz
yes	yes	yes	yes
IP 67	IP 67	IP 67	IP 67
PTFE coated brass ceramic coated/PTFE connector	PTFE coated brass PTFE connector	PTFE coated brass ceramic coated/PTFE connector	PTFE coated brass PTFE connector
cULus	cULus	cULus	cULus
C04 AEL-00-TY-050M	C04 AEL-00-TY-050M	C04 AEL-00-TY-050M	C04 AEL-00-TY-050M

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

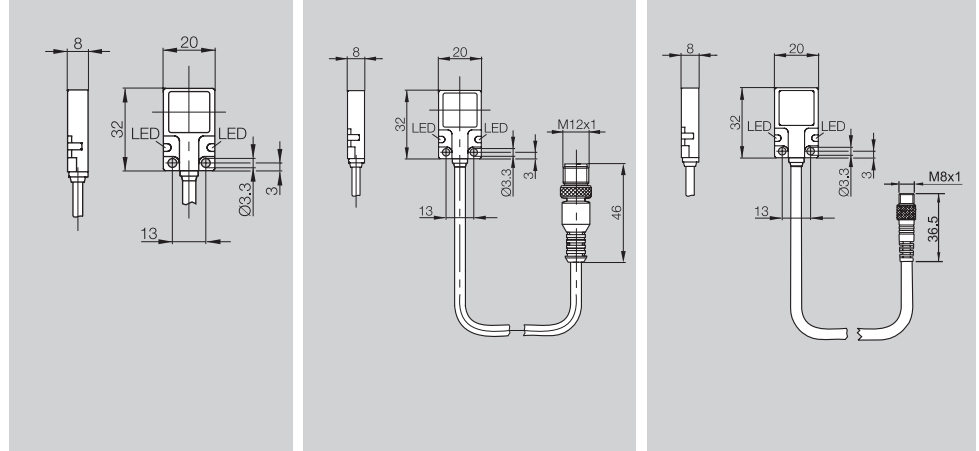
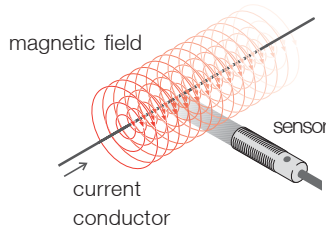


Inductive Sensors

DC 3-Wire
Block
S_n 5 mm

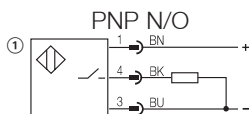
Welding Sensors WELDFIELD Immune

Housing Size	20x32x8	20x32x8	20x32x8
Mounting	flush	flush	flush
Rated Operating Distance s _n	5 mm	5 mm	5 mm
Assured Operating Distance s _a	0...4.1 mm	0...4.1 mm	0...4.1 mm



PNP SlagMaster®	Normally-open ①	BES R01ZC-PSC50B-BX05-W01	BES R01ZC-PSC50B-BX00.2-GS04-W01	
PNP	Normally-open ①	BES R01ZC-PSC50B-BX03-V	BES R01ZC-PSC50B-BX00.2-GS04-V	BES R01ZC-PSC50B-BX00.2-GS49-V
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
Voltage Drop U _d at I _e	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
Rated Insulation Voltage U _i	75 Vdc	75 Vdc	75 Vdc	75 Vdc
Rated Operational Current	200 mA	200 mA	200 mA	200 mA
No-load Supply Current I ₀ damped/undamped	≤ 15 mA	≤ 15 mA	≤ 15 mA	≤ 15 mA
Off-state Current I _r	≤ 80 μA	≤ 80 μA	≤ 80 μA	≤ 80 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	100 Hz	100 Hz	100 Hz	100 Hz
Function Indication	yes	yes	yes	yes
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67	IP 67
Insulation Class	GD-Zn	GD-Zn	GD-Zn	GD-Zn
Housing Material	ceramic coated/PA 12	ceramic coated/PA 12	ceramic coated/PA 12	PA 12
Connection	irradiated PVC cable	cable with connector	cable with connector	cable with connector
No. of Wires x Gauge	3x24 AWG	3x24 AWG	3x24 AWG	3x24 AWG
Approvals	cULus	cULus	cULus	cULus
Recommended Connector		C04 AEL-00-TY-050M		C49 ANE-00-TY-050M-2

Wiring Diagram



Accessories

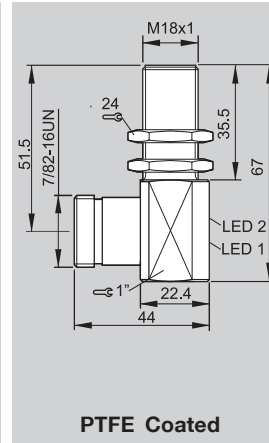
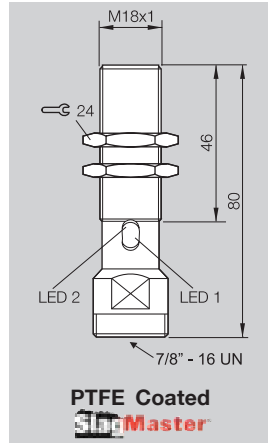
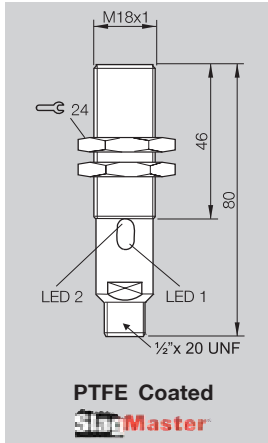


Housing Size	
Mounting	
Rated Operating Distance s _n	
Assured Operating Distance s _a	

M18 x1
flush
5 mm
0...4 mm

M18x1
flush
5 mm
0...4 mm

M18x1
flush
5 mm
0...4 mm



AC/DC	SlagMaster®	Normally-open ⑰
AC/DC		Normally-open ⑰

BES 516-211-SA96-S21-EL-W
BES 516-211-S21-EL-W

BES 516-211-SA96-S5-EL-W
BES 516-211-S5-EL-W

BES 516-211-S5-EL-W-SA 1

Rated Operational Voltage U _e	110 Vdc
Supply Voltage U _B	20...250 Vac/Vdc
Voltage Drop U _d at I _e	≤ 7.5 V
Rated Insulation Voltage U _i	250 Vac
Load Current Capacity	400 mA
Off-state Current I _r	≤ 1.7 mA
Protected Against Polarity Reversal	yes
Short Circuit Protected	yes
Load Capacitance	—

110 Vdc
20...250 Vac/Vdc
≤ 7.5 V
250 Vac
400 mA
≤ 1.7 mA
yes
yes
—

110 Vdc
20...250 Vac/Vdc
≤ 7.5 V
250 Vac
400 mA
≤ 1.7 mA
yes
yes
—

110 Vac
20...250 Vac/Vdc
≤ 7.5 V
250 Vac
400 mA
≤ 1.7 mA
yes
yes
—

Repeat Accuracy R	≤ 5 %
Ambient Temperature Range T _a	-25...+70 °C
Operating Frequency f	400 Hz
Function Indication/Power Indication	yes/yes

≤ 5 %
-25...+70 °C
400 Hz
yes/yes

≤ 5 %
-25...+70 °C
100 Hz
yes/yes

≤ 5 %
-25...+70 °C
100 Hz
yes/yes

Degree of Protection per IEC 60529	IP 67
Insulation Class	with protect. GND
Housing Material	PTFE coated brass
Material of Sensing Face	ceramic coated/PTFE
Connection	connector
Approvals	cULus
Recommended Connector	C21 AE3-00-TY-150F

IP 67
with protect. GND
PTFE coated brass
ceramic coated/PTFE
connector
cULus
C05 AE2-00-TY-150F

IP 67
with protect. GND
PTFE coated brass
PTFE
connector
cULus
C05 AE2-00-TY-150F

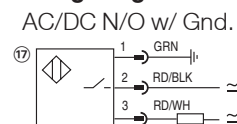
IP 67
with protect. GND
PTFE coated brass
PTFE
connector
cULus
C05 AE2-00-TY-150F

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

For more information on SlagMaster®, see page 1.41.



Wiring Diagram



- Contents
- Selection Charts
- Part Numbers
- Featured
 - GlobalProx®
 - DC 3-Wire
 - DC 2-Wire
 - SteelFace®
 - 2x
 - 3x
 - Fe/NFe
 - Welding
 - Factor 1
 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories

- 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
 - DC 2-Wire Block

- Specialty
 - SuperShorties™
 - Proxinox®
 - High Temp
 - Analog
 - Large Housing
 - Ring Sensor

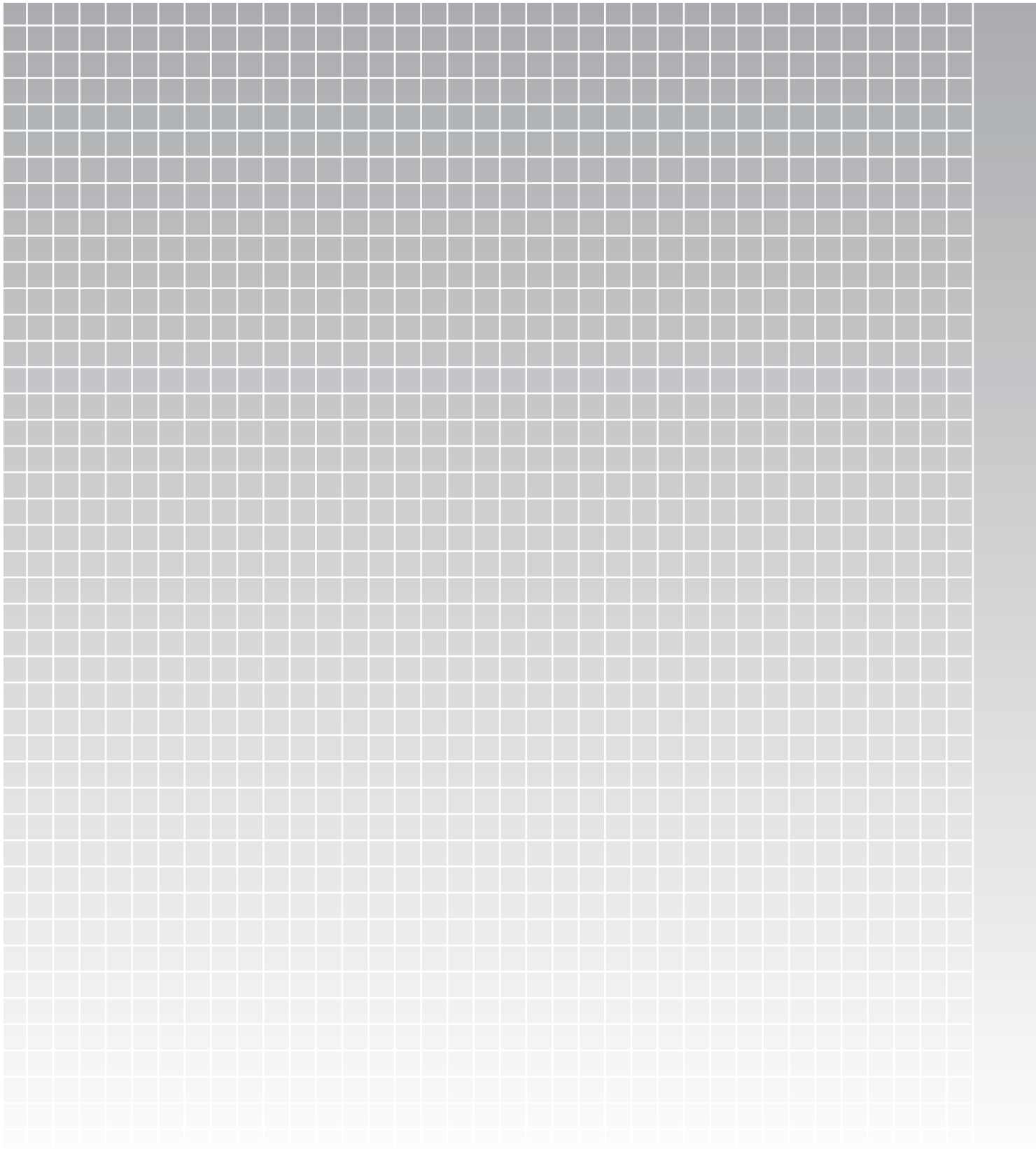
6 Connectors

7 Accessories

o Product Overview

t Technical Reference

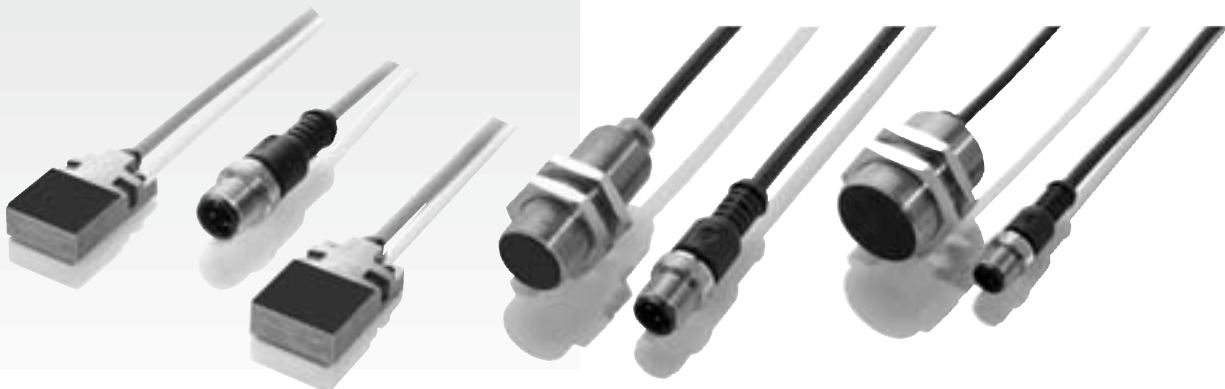
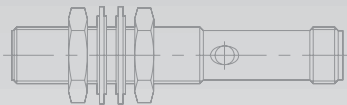
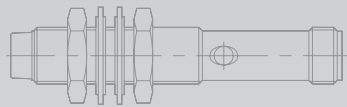
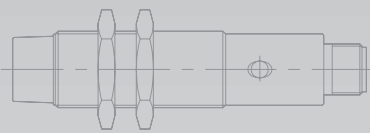
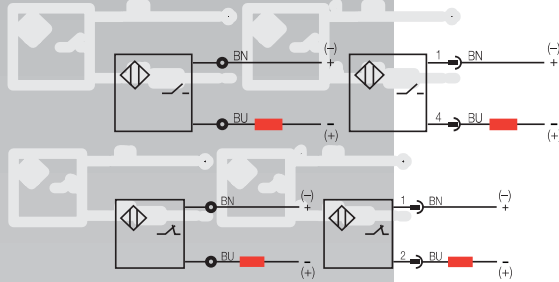
p Part Number Index



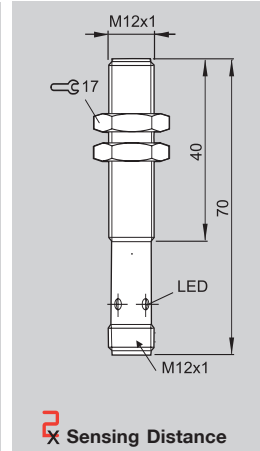
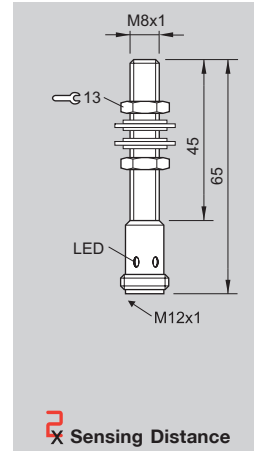
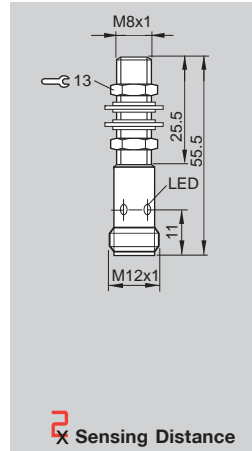
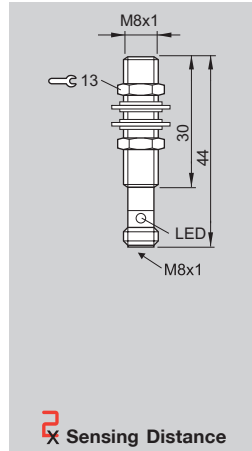
SlagMaster®

SlagMaster® is a proprietary ceramic-based protective coating that is factory-applied over the sensing face. By resisting the effects of continuous hot weld spatter, SlagMaster prolongs sensor life by resisting the melting and erosion of the sensor face. It also enhances sensor reliability by repelling weld berries that could become embedded into the sensor face and cause the sensor to lock on.

- 1.42** DC 3-Wire M8, M12
- 1.43** DC 3-Wire 20x32x8
- 1.45** DC 2-Wire M8, M12
- 1.46** DC 2-Wire M18, M30



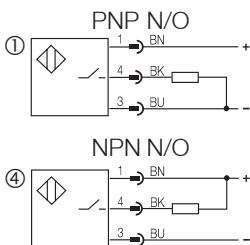
Housing Size	M8x1	M8x1	M8x1	M12x1
Mounting	flush*	flush*	flush*	flush*
Rated Operating Distance s _n	2 mm	2 mm	2 mm	4 mm
Assured Operating Distance s _a	0...1.6 mm	0...1.6 mm	0...1.6 mm	0...3.2 mm



PNP	Normally-open ①	BES 516-324-SA96-G-E5-C-S49	BES 516-324-SA96-G-E5-C-S4	BES 516-325-SA96-G-S4-C
NPN	Normally-open ④	BES 516-343-SA96-G-E5-C-S49	BES 516-343-SA96-G-E5-C-S4	BES 516-343-SA96-G-E5-C-S4
Rated operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	12...30 Vdc	10...30 Vdc
Voltage drop U _d at I _e	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
Rated Insulation Voltage U _i	75 Vdc	75 Vdc	75 Vdc	250 Vac
Rated Operational Current I _e	200 mA	200 mA	200 mA	200 mA
Current Consumption (closed/open)	≤ 25 mA/≤ 12 mA	≤ 25 mA/≤ 12 mA	≤ 10 mA/≤ 5 mA	≤ 12 mA/≤ 4 mA
Off-state Current I _r	≤ 80 μA	≤ 80 μA	≤ 20 μA	≤ 80 μA
Protected Against Polarity Reversal	yes	yes	yes	yes
Short Circuit Protected	yes	yes	yes	yes
Load Capacity	≤ 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	1000 Hz	1000 Hz	700 Hz	600 Hz
Function Indication	yes	yes	yes	yes
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67	IP 67
Housing Material	stainless steel	stainless steel	nickel plated brass	nickel plated brass
Material of Sensing Face	ceramic coated PBTP	ceramic coated PBTP	ceramic coated PBT	ceramic coated LCP
Connection	connector	connector	connector	connector
No. of Wires x Gauge				
Approvals	cULus	cULus	cULus	cULus
Recommended connector	C49 ANE-00-TY-050M-2	C04 AEL-00-TY-050M	C04 AEL-00-TY-050M	C04 AEL-00-TY-050M

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

Wiring Diagrams



M12x1 flush* 4 mm 0...3.2 mm	M18x1 flush* 8 mm 0...6.5 mm	20x32x8 flush 7 mm 0...5.7 mm	20x32x8 flush 7 mm 0...5.7 mm
BES 516-325-SA96-G-E5-Y-S4 BES 516-329-SA96-G-E5-Y-S4	BES 516-326-SA96-G-E5-Y-S4 BES 516-355-SA96-G-E5-Y-S4	BES R01ZC-PSC70B-BX05-W01	BES R01ZC-PSC70B-BP00.2-GS04-101
24 Vdc 10...30 Vdc ≤ 3.5 V 75 Vdc 130 mA ≤ 25 mA/≤ 12 mA ≤ 80 µA yes yes ≤ 1.0 µF	24 Vdc 10...30 Vdc ≤ 3.5 V 75 Vdc 130 mA ≤ 25 mA/≤ 12 mA ≤ 80 µA yes yes ≤ 1.0 µF	24 Vdc 10...30 Vdc ≤ 2.5 V 75 Vdc 200 mA ≤ 15 mA ≤ 80 µA yes yes ≤ 1.0 µF	24 Vdc 10...30 Vdc ≤ 2.5 V 75 Vdc 200 mA ≤ 15 mA ≤ 80 µA yes yes ≤ 1.0 µF
≤ 5 % -25...+70 °C 600 Hz yes	≤ 5 % -25...+70 °C 200 Hz yes	≤ 5 % -25...+70 °C 150 Hz yes	≤ 5 % -25...+70 °C 150 Hz yes
IP 67 nickel plated brass ceramic coated PA 12 connector	IP 67 nickel plated brass ceramic coated PBTP connector	IP 67 GD-Zn ceramic coated PA 12 irradiated cable 4x26 AWG	IP 67 GD-Zn ceramic coated PA 12 PUR cable with connector
cULus C04 AEL-00-TY-050M	cULus C04 AEL-00-TY-050M	cULus	cULus C04 AEL-00-TY-050M

Accessories



BES R01-SH-4-A
(Retro-fit Bunker Block)



BES R01-SH-4-B
(Socket style Bunker Block
for new installations)



- Contents
- Selection Charts
- Part Numbers
- Featured
- GlobalProx®
– DC 3-Wire
– DC 2-Wire
- SteelFace®
– 2x
– 3x
– Fe/NFe
- Welding
– Factor 1
– Weld Field Immune
– SlagMaster®
– Welding Accessories

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
- DC 2-Wire Block

Specialty

- SuperShorties™
- Proxinox®
- High Temp
- Analog
- Large Housing
- Ring Sensor

6 Connectors

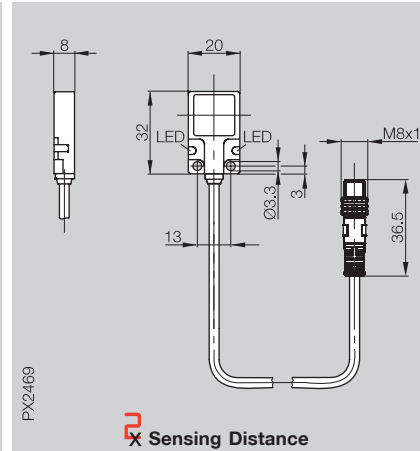
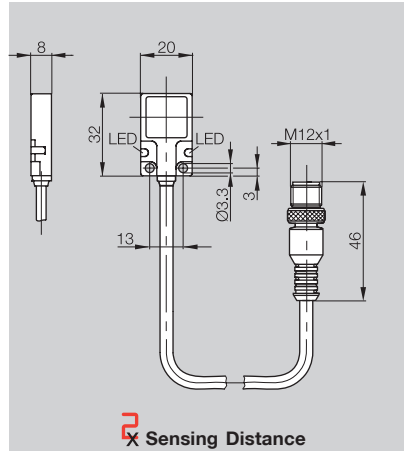
7 Accessories

o Product Overview

t Technical Reference

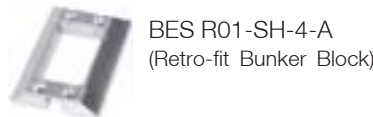
p Part Number Index

Housing Size	20x32x8	20x32x8
Mounting	flush	flush
Rated Operating Distance s _n	7 mm	7 mm
Assured Operating Distance s _a	0...5.7 mm	0...5.7 mm

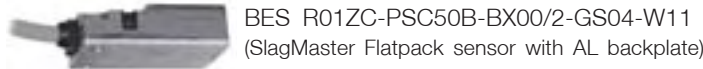
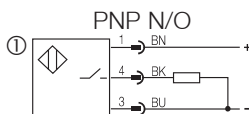


PNP	Normally-open ①	BES R01ZC-PSC70B-BX00.2-GS04-101	BES R01ZC-PSC70B-BX00.2-GS49-101
Rated Operational Voltage U _e		24 Vdc	24 Vdc
Supply Voltage U _B		10...30 Vdc	10...30 Vdc
Voltage Drop U _d at I _e		≤ 2.5 V	≤ 2.5 V
Rated Insulation Voltage U _i		75 Vdc	75 Vdc
Rated Operational Current		200 mA	200 mA
Current Consumption (closed/open)		≤ 15 mA	≤ 15 mA
Off-state Current I _r		≤ 80 µA	≤ 80 µA
Protected Against Polarity Reversal		yes	yes
Short Circuit Protected		yes	yes
Load Capacity		≤ 1.0 µF	≤ 1.0 µF
Repeat Accuracy R		≤ 5 %	≤ 5 %
Ambient Temperature Range T _a		-25...+70 °C	-25...+70 °C
Operating Frequency f		150 Hz	150 Hz
Function Indication		yes	yes
Degree of Protection per IEC 60529		IP 67	IP 67
Housing Material		GD-Zn	GD-Zn
Material of Sensing Face		ceramic coated PA 12	ceramic coated PA 12
Connection		irradiated cable with connector	irradiated cable with connector
Approvals		cULus	cULus
Recommended Connector		C04 AEL-00-TY-050M	C49 ANE-00-TY-050M-2

Accessories

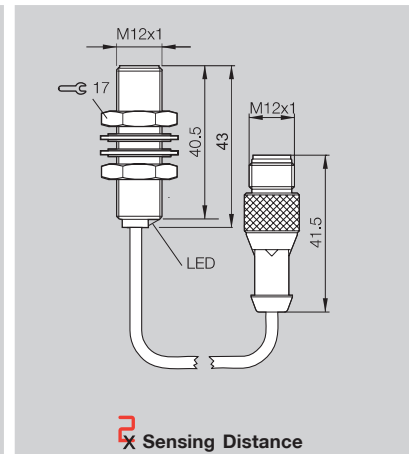
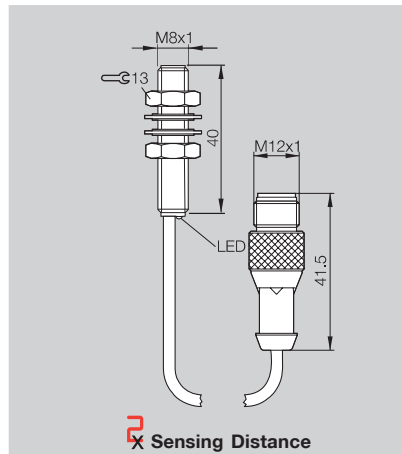


Wiring Diagram



Housing Size	M8x1
Mounting	flush*
Rated Operating Distance s _n	2 mm
Assured Operating Distance s _a	0...1.6 mm

Housing Size	M12x1
Mounting	flush*
Rated Operating Distance s _n	3 mm
Assured Operating Distance s _a	0...2.4 mm

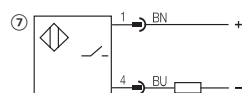


DC 2-wire	Normally-open ⑦	BES M08MG-GSC20B-BP00.3-GS04-101	BES M12MG-GSC30B-BP00.3-GS04-101
Rated Operational Voltage U _e		24 Vdc	24 Vdc
Supply Voltage U _B		10...30 Vdc	10...30 Vdc
Polarity		Polarized	Polarized
Voltage Drop U _d at I _e		≤ 5.0 V	≤ 5.0 V
Rated Insulation Voltage U _i		75 Vdc	75 Vdc
Rated Operational Current I _e		100 mA	100 mA
Minimum Operational Current I _m		5 mA	5 mA
Off-state Current I _f		≤ 600 μA	≤ 600 μA
Protected Against Polarity Reversal		yes	yes
Short Circuit Protected		yes	yes
Load Capacitance		≤ 1.0 μF	≤ 1.0 μF
Repeat Accuracy R		≤ 5%	≤ 5%
Ambient Temperature Range T _a		-25...+70 °C	-25...+70 °C
Operating Frequency f		1500 Hz	1300 Hz
Function Indication		yes	yes
Degree of Protection per IEC 60529		IP 67	IP 67
Housing Material		nickel free brass	nickel free brass
Material of Sensing Face		ceramic coated PBT	ceramic coated PA 12
Connection		cable with connector	cable with connector
Approvals		cULus	cULus
Recommended Connector		BKS-S 19-13-PU-05	BKS-S 19-13-PU-05

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

Wiring Diagram

Polarized
DC 2-wire N/O

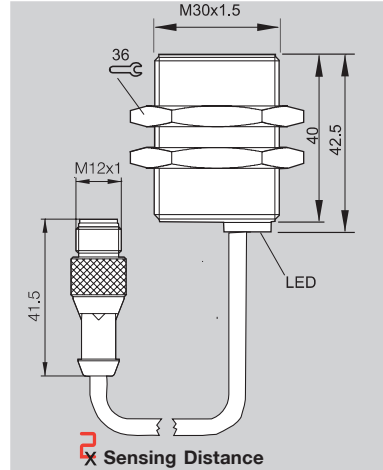
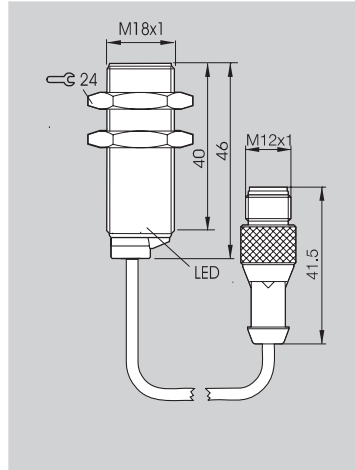


Inductive Sensors

DC 2-Wire
M18, M30
s_n 7 mm, 15 mm



Housing Size	M18x1	M30x1.5
Mounting	flush	flush
Rated Operating Distance s _n	7 mm	15 mm
Assured Operating Distance s _a	0...5.7 mm	0...12.2 mm

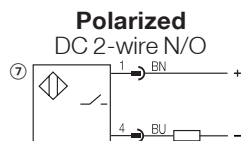


DC 2-wire	Normally-open ⑦	BES M18MG-GSC70B-BP00.3-GS04-101	BES M30MF-GSC15B-BP00.3-GS04
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	10...30 Vdc
Polarity	Polarized	Polarized	Polarized
Voltage Drop U _d at I _e	≤ 5.0 V	≤ 5.0 V	≤ 5.0 V
Rated Insulation Voltage U _i	75 Vdc	75 Vdc	75 Vdc
Rated Operational Current I _e	100 mA	100 mA	100 mA
Minimum Operational Current I _m	5 mA	5 mA	5 mA
Off-state Current I _r	≤ 600 μA	≤ 600 μA	≤ 600 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	600 Hz	400 Hz	400 Hz
Function Indication	yes	yes	yes
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67
Housing Material	nickel free brass	nickel free brass	nickel free brass
Material of Sensing Face	ceramic coated PBT	ceramic coated PA 12	ceramic coated PA 12
Connection	cable with connector	cable with connector	cable with connector
Approvals	cULus	cULus	cULus
Recommended Connector	BKS-S 19-13-PU-05	BKS-S 19-13-PU-05	BKS-S 19-13-PU-05

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



Wiring Diagram

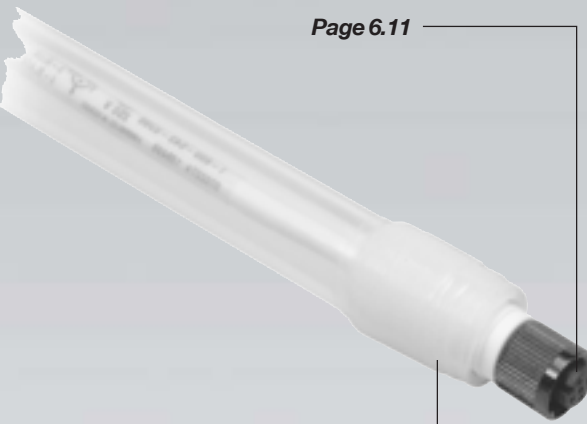


Welding Total Solution

TPE Cables

TPE (Thermoplastic Elastomer) jacketed connectors take PUR sensor connectors to a new level of unparalleled performance, even in the most extreme environments where weld spatter, high flex, coolants, lubricants, and knick and cut-prone manufacturing hostilities exist.

Page 6.11



Weld Repel™

Heat and slag build up cause sensors, cables, and connectors to prematurely fail in the weld cell environment. New Weld Repel™ silicone tubular jacketing and silicone self-bonding wrap sheds slag and protects cabling from up to 500°F of ambient heat. Weld Repel products increase control products survivability to months rather than hours or days, while decreasing the need for productivity wasting maintenance stoppages.

Page 1.50

Weld Select Series

The Weld Select series from Balluff is the ultimate solution for increasing sensor life and productivity. These weld accessories will extend the life of sensors and cables in hostile weld cell environments.

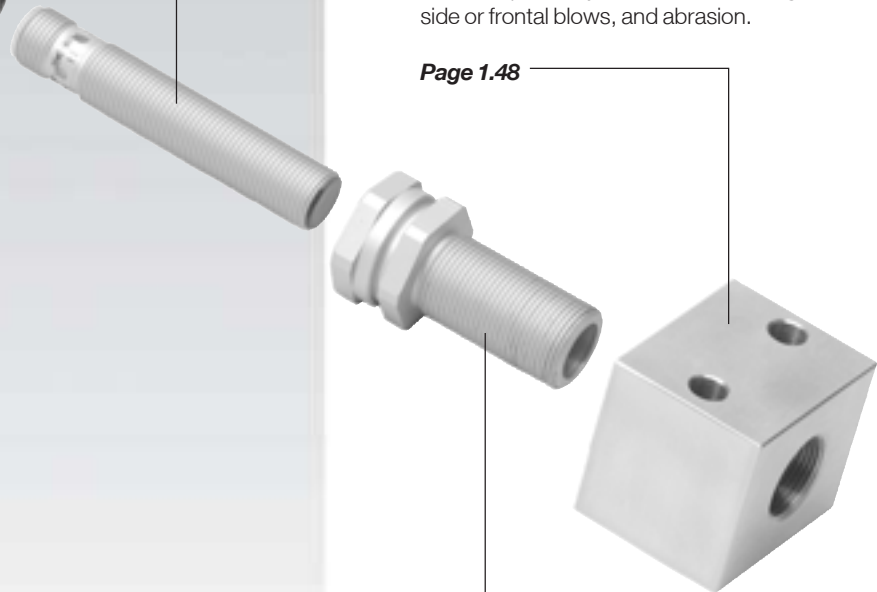
SlagMaster® sensors recommended

Page 1.27-1.46

Bunker Block®

Most sensors are not built to take hits from heavy objects, either during loading or the production process. Balluff Bunker Blocks are specifically designed to protect flush mounted inductive proximity sensors from damage from side or frontal blows, and abrasion.

Page 1.48



Prox Mounts

Prox Mounts provide precise gapping of inductive proximity sensors, rapid change-out, and act as a heat sink in weld cells. Available with a non-stick PTFE coating that resists weld spatter accumulation and allows for removal of weld debris.

Page 1.49

Contents

Selection Charts

Part Numbers

Featured

GlobalProx®
– DC 3-Wire
– DC 2-Wire

SteelFace®
– 2x
– 3x
– Fe/NFe

Welding

– Factor 1
– Weld Field Immune
– SlagMaster®
– Welding Accessories

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

DC 2-Wire Block

Specialty

SuperShorties™
Proxinox®
High Temp Analog
Large Housing
Ring Sensor

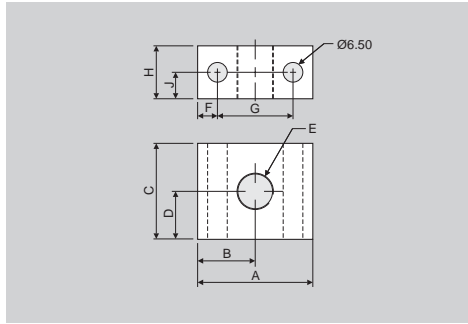
Connectors

Accessories

Product Overview

Technical Reference

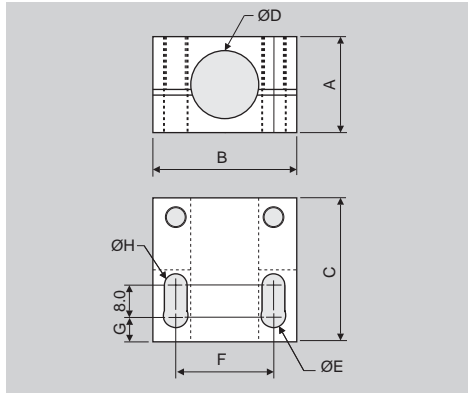
Part Number Index



Bunker Block®

Machined AL	Prox Mount Required	A	B	C	D	E	F	G	H	J
BES 12.0-KB-9L	BES 08,0-KH-2L/W	38.1	19.05	31.75	15.88	M12	6.55	25	34	17
BES 16.0-KB-9L	BES 12,0-KH-2L/W	38.1	19.05	31.75	15.88	M16	6.55	25	30	15
BES 24.0-KB-9L	BES 18,0-KH-2L/W	50.8	25.4	38.1	19.05	M24	7.9	35	40	20
BES 36.0-KB-9L	BES 30,0-KH-2L/W	63.5	31.75	50.8	25.4	M36	7.75	48	40	20
BES 12.0-KB-9S	BES 08,0-KH-2S/W	38.1	19.05	31.75	15.88	M12	6.55	25	17.5	8.75
BES 16.0-KB-9S	BES 12,0-KH-2S/W	38.1	19.05	31.75	15.88	M16	6.55	25	19.5	9.75
BES 24.0-KB-9S	BES 18,0-KH-2S/W	50.8	25.4	38.1	19.05	M24	7.9	35	20.5	10.25
BES 36.0-KB-9S	BES 30,0-KH-2S/W	63.5	31.75	50.8	25.4	M36	7.75	48	20.5	10.25

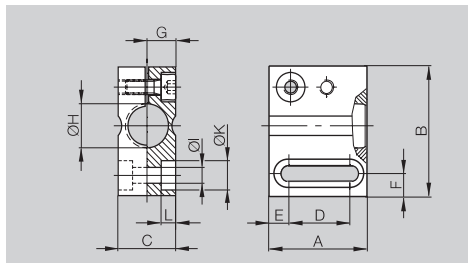
Material: Aluminum



Steel Bunker Block® II without positive stop

	A	B	C	ØD	ØE	F	G	ØH
BES 08.0-KB-10/W	12.7	28.58	35	8	5.5	17	6.45	4.5
BES 12.0-KB-10/W	19.05	34.92	38.1	12	5.5	22	7	4.5
BES 18.0-KB-10/W	25.4	38.1	38.1	18	6.5	26	7	5.5
BES 30.0-KB-10/W	38.1	60	44.45	30	8.5	42	6.45	6.5

Material: Copper plated steel



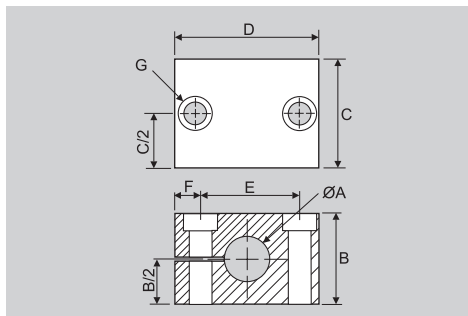
Clamp with positive stop

	A	B	C	D	E	F	G	ØH	ØI	ØK	L
BES 08.0-KB-4-F	28	30	12	20	4	5	6	8	3.4	6	3.4
BES 12.0-KB-4-F	28	35	16	17	5.5	6	8	12	4.3	8	4
BES 18.0-KB-4-F	28	40	22	17	5.5	6	11	18	4.3	8	4
BES 30.0-KB-4-F	34	56	34	22	6	7	17	30	6.4	10	6

Note for aluminum clamps with positive stop:

The switching distance of the proximity switch may be reduced by use of these clamps. Note this when using this clamping system.

Material: Aluminum



Slotted block without positive stop

	A	B	C	D	E	F	G
BES 08.0-KB-6	8	16.0	19.2	25.4	18.4	3.5	4-40 SHCS
BES 12.0-KB-6	12	25.4	19.2	38.1	25.0	6.6	10-32 SHCS
BES 18.0-KB-6	18	31.8	25.4	38.1	30.7	3.7	8-32 SHCS
BES 30.0-KB-6	30	50.8	33.1	63.5	51.6	6.0	1/4 SHCS

Material: Aluminum



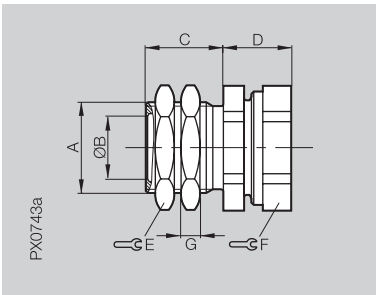
Quick Installation

The compression ring and metal nut allow tubular sensors to be installed without the use of tools. After the initial install, the prox mount stays in place allowing easy replacement and minimizing down time.

Sensor Protection

The PTFE coating repels weld slag. Prox mounts, when used with Bunker Blocks®, provide maximum protection to sensors in the most abusive environments.

Note: The sensing range of the inductive proximity sensor may be slightly reduced when using the positive stop models.

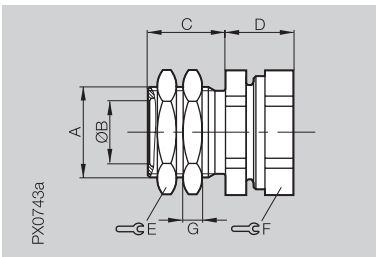


PTFE coated prox mounts with positive stop for sensors with thread length 30 mm

	A	ØB	C	D max.	E	F	G
BES 05.0-KH-2S/W	M5x0.5	5	13	11	13	13	4
BES 08.0-KH-2S/W	M12x1 [†]	8	17.5	14.5	17	17	4
BES 12.0-KH-2S/W	M16x1	12	19.5	14.5	22	22	4
BES 12.0-KH-2S/W-M18	M18x1 [†]	12	19.5	14.5	22	22	4
BES 18.0-KH-2S/W	M24x1.5	18	20.5	15.5	30	30	5
BES 30.0-KH-2S/W	M36x1.5	30	20.5	15.5	41	41	6

Material: CuZn, PTFE coated

[†]Allows smaller diameter sensor to replace larger when installed in the prox mount

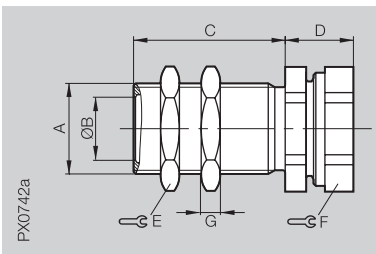


PTFE coated prox mounts with positive stop for sensors with thread length 30 mm

	A	ØB	C	D max.	E	F	G
BES 08.0-KH-11S/W	M12x1 [†]	8	17.5	15.5	17	17	4
BES 12.0-KH-11S/W	M16x1	12	21	15.5	22	22	4
BES 12.0-KH-11S/W-M18	M18x1 [†]	12	21	15.5	22	22	4
BES 18.0-KH-11S/W	M24x1.5	18	21.5	15.5	30	30	5

Material: STEEL, black PTFE coated

[†]Allows smaller diameter sensor to replace larger when installed in the prox mount



PTFE coated prox mounts with positive stop for sensors with thread length 40 mm or longer

	A	ØB	C	D max.	E	F	G
BES 08.0-KH-2L/W	M12x1	8	34	14.5	17	17	4
BES 12.0-KH-2L/W	M16x1	12	30	14.5	22	22	4
BES 18.0-KH-2L/W	M24x1.5	18	40	18	30	30	5
BES 30.0-KH-2L/W	M36x1.5	30	40	18	41	41	6

Material: CuZn, PTFE coated



- Contents
- Selection Charts
- Part Numbers
- Featured
 - GlobalProx®
 - DC 3-Wire
 - DC 2-Wire
 - SteelFace®
 - 2x
 - 3x
 - Fe/NFe
 - Welding
 - Factor 1
 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories
- 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
 - DC 2-Wire Block
- Specialty
 - SuperShorties™
 - Proxinox®
 - High Temp
 - Analog
 - Large Housing
 - Ring Sensor



Weld Repel™ Wrap

BKS PW-26/20-SI-TR-03,5	1" wide x 12 ft Clear silicone wrap
BKS PW-51/30-SI-TR-11	2" wide x 36 ft Clear silicone wrap



Weld Repel™ Sheets

Part Number	BKS-PS-914/16-SI	BKS-PS-914/16-SI-00,91
Length Info.	3 ft x custom length in ft	3 ft x ft sheet
Thickness	1.58 mm	1.58 mm
Max. Length	165 ft per roll	165 ft per roll
Elongation	600%	600%
Tear Strength	150 PSI	150 PSI
Temperature	-65°C to 233°C (-80°F to 450°F)	-65°C to 233°C (-80°F to 450°F)



Weld Repel™ Jacket (order by the meter)

	ID	ID	Rollsize
BKS-PT-7/16-SI	1/4" dia.	7 mm	15 m
BKS-PT-10/16-SI	3/8" dia.†	10 mm†	15 m†
BKS-PT-13/16-SI	1/2" dia.††	13 mm††	15 m††
BKS-PT-16/16-SI	5/8" dia.**	16 mm**	15 m**
BKS-PT-19/16-SI	3/4" dia.	19 mm	15 m
BKS-PT-38/16-SI	1/5 dia.	38 mm	7.5 m
BKS-PT-50/16-SI	2" dia.	50 mm	7.5 m

* Recommended for use with M12 (micro) single ended cables
 ** Recommended for use with M12 (micro) double ended cables
 † Recommended for use with M8 (nano) single ended cables
 †† Recommended for use with M8 (nano) double ended cables

Specifications

Temperature Rating	-85°F to 500°F
Electrical Insulation Rating	400 Volts/mil thickness (wrap only)
Tensile Strength	700 PSI (wrap only)
Elongation	300% (wrap only)
Material	Clear Silicone



WELD Jacket

WELD-JACKET-1/2"	Silicone & fiberglass 1/2" diameter (by the foot)
WELD-JACKET-3/4"	Silicone & fiberglass 3/4" diameter (by the foot)



Q40 Sensor Accessories

BES Q40-HW-2	Metal mounting bracket
BES Q40-SH-1	AL protection cover
BES Q40-SH-2	PA6 protection cover



Protective Caps

BES 12 CERAMIC-CAP-1	Ceramic for M12 sensors
BES 18,CERAMIC-CAP-1	Ceramic for M18 sensors
BES 30,CERAMIC-CAP-1	Ceramic for M30 sensors
BES__-SM-4	PTFE caps for prox mounts (12, 16, 24, 36)



Heavy Duty Actuator

BES JPH-0.625-12-1.50	Prox plunger for M12 sensors
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Ceramic Faces

		Diameter (mm)	Thickness (mm)
604094	M8x1	5.8	0.3
619341	M12x1	10.4	0.3
505933	M18x1	15.2	0.5
634036	M30x1.5	27.9	0.5

An epoxy similar to Loctite 480-40 is recommended for installing Ceramic Faces.



Stop Wasting Sensors and select your sensor based on application

Change the Paradigm and use sensor and cable protection systems

Reduce Downtime by installing SlagMaster® and SteelFace® sensors

Slash Consumption by protecting with Weld Repe/™ Jacket and Wrap

Boost Profitability by extending sensor life

Contents
Selection Charts
Part Numbers

Featured

GlobalProx®
– DC 3-Wire
– DC 2-Wire

SteelFace®
– 2x
– 3x
– Fe/NFe

Welding
– Factor 1
– Weld Field Immune
– SlagMaster®
– **Welding Accessories**

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

DC 2-Wire Block

Specialty

SuperShorties™
Proxinox®
High Temp
Analog
Large Housing
Ring Sensor

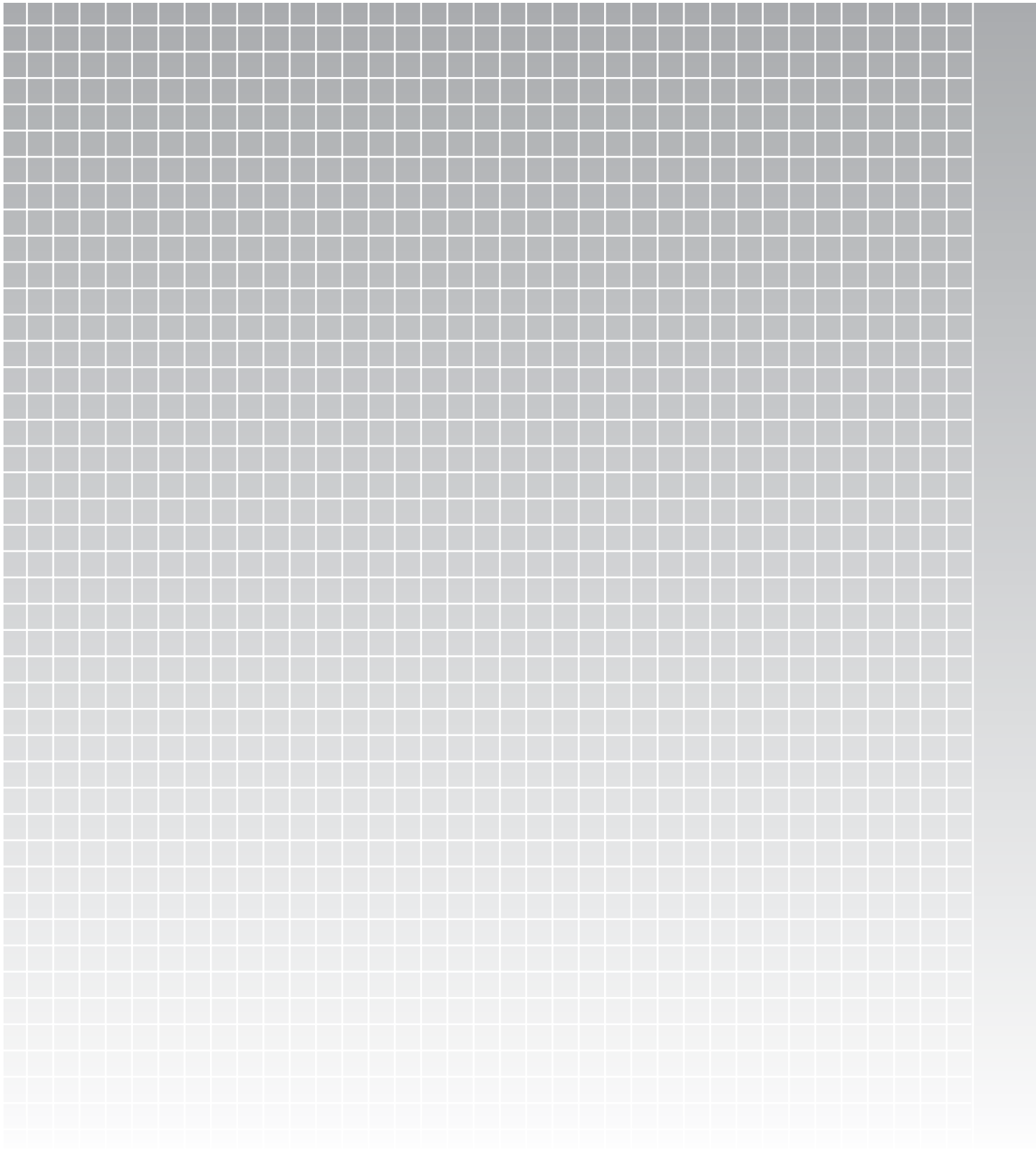
6 Connectors

7 Accessories

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DC 3-/4-Wire

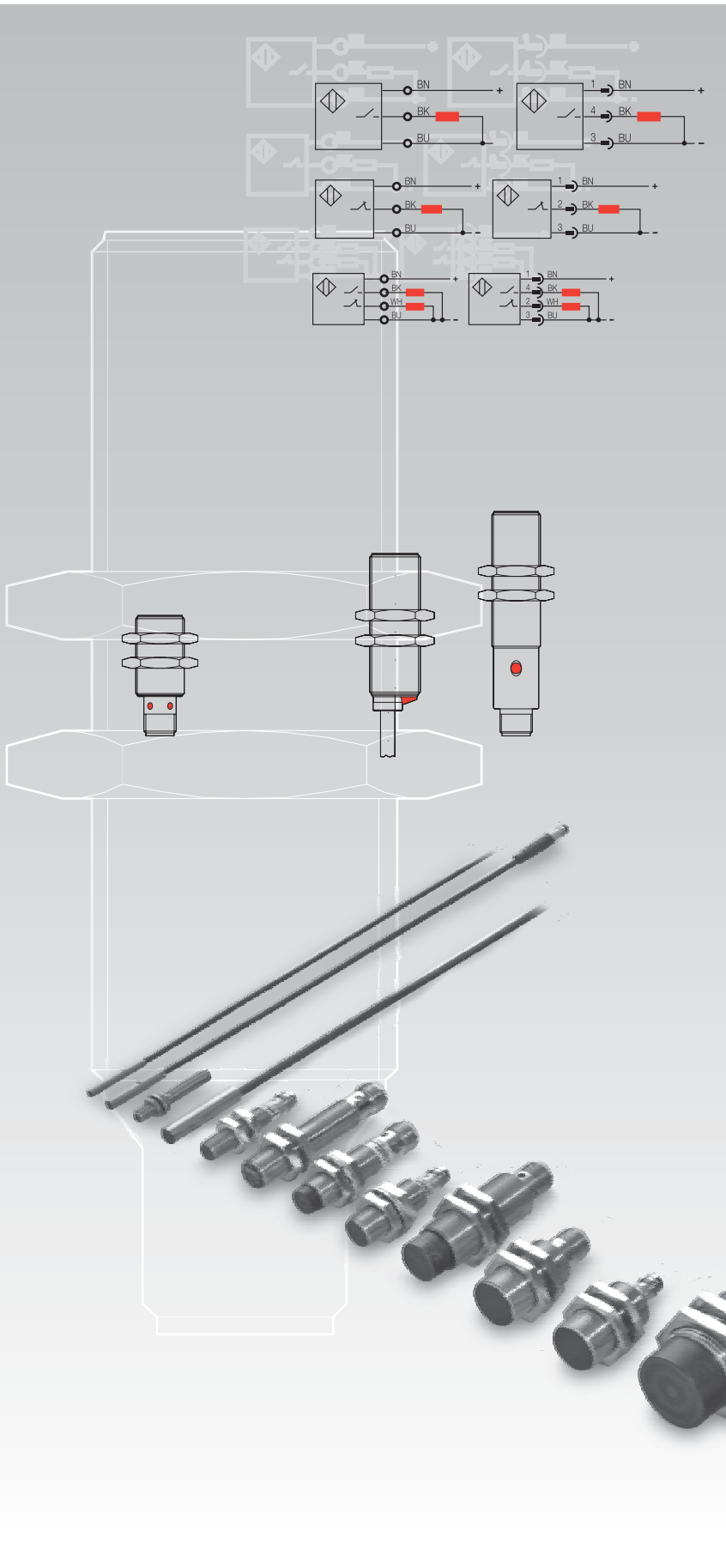
Inductive Sensors

DC 3-/4-Wire Tubular Sensors Contents

DC 3-and 4-Wire Tubular Sensors

Balluff's largest and most popular sensor family, DC 3- and 4-wire tubular sensors are used extensively around the world. Available with PNP, NPN, Normally-open, Normally-closed, and Complementary outputs and a range of connection options. Balluff DC 3- and 4-wire tubular sensors are protected against short circuits, polarity reversal, current overloads, and voltage spikes, and come with Balluff's lifetime warranty.

- 1.54** DC 3-/4-Wire Ø 3 mm
- 1.54** DC 3-/4-Wire Ø 4 mm
- 1.57** DC 3-/4-Wire M5
- 1.59** DC 3-/4-Wire Ø 6.5 mm
- 1.61** DC 3-/4-Wire Ø 8 mm
- 1.62** DC 3-/4-Wire M8
- 1.72** DC 3-/4-Wire M12
- 1.81** DC 3-/4-Wire M18
- 1.87** DC 3-/4-Wire M30



Inductive

1

- Contents
- Selection Charts
- Part Numbers
- Featured
 - GlobalProx®
 - DC 3-Wire
 - DC 2-Wire
 - SteelFace®
 - 2x
 - 3x
 - Fe/NFe
 - Welding
 - Factor 1
 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories

- 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
 - DC 2-Wire Block
- Specialty
 - SuperShorties™
 - Proxinox®
 - High Temp
 - Analog
 - Large Housing
 - Ring Sensor

6

Connectors

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Accessories

o

Product Overview

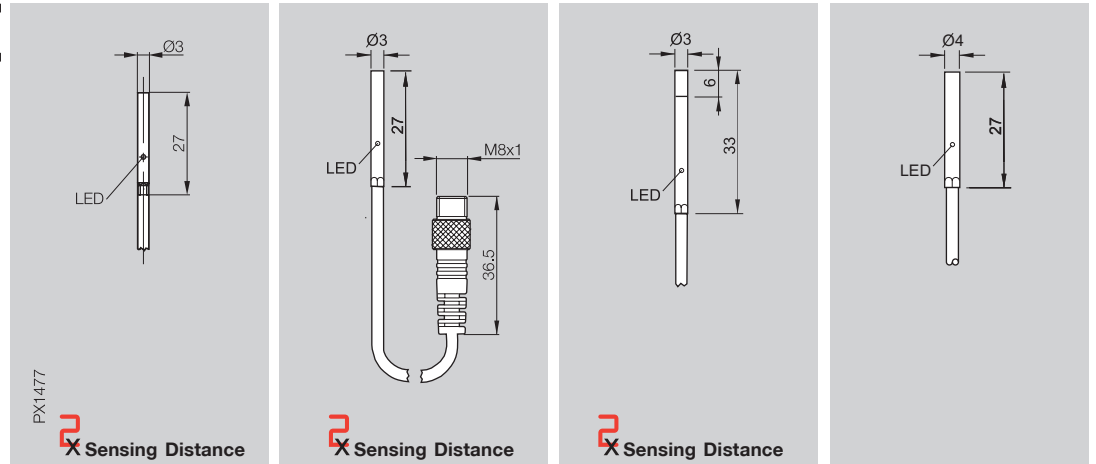
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Technical Reference

p

Part Number Index

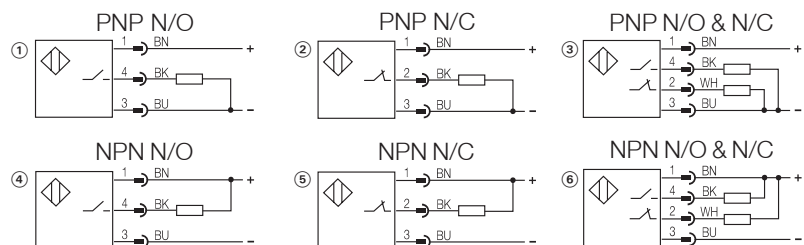
Housing Size	Ø 3 mm	Ø 3 mm	Ø 3 mm	Ø 4 mm
Mounting	flush*	flush*	non-flush*	flush
Rated Operating Distance s _n	1.0 mm	1.0 mm	3 mm	0.8 mm
Assured Operating Distance s _a	0...0.8 mm	0...0.8 mm	0...2.3 mm	0...0.6 mm



PNP	Normally-open ①	BES 516-3044-G-E4-C-PU-05	BES 516-3044-G-E4-C-S49-00,3	BES 516-3048-G-E4-C-PU-05	BES 516-3007-E4-C-PU-05
	Normally-closed ②	BES 516-3046-G-E4-C-PU-05			
NPN	Normally-open ④		BES 516-3046-G-E4-L-S49-00,3		
	Normally-closed ⑤				
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc	
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	21.6...26.4 Vdc	10...30 Vdc	
Voltage Drop U _d at I _e	≤ 2.5 V	≤ 1.5 V	≤ 2.5 V	≤ 3.0 V	
Rated Insulation Voltage U _i	75 Vdc	75 Vdc	75 Vdc	75 Vdc	
Load Current Capacity	100 mA	100 mA	50 mA	100 mA	
Current Consumption (closed/open)	≤ 12 mA	≤ 12 mA	≤ 10 mA	≤ 12 mA	
Off-state Current I _r	≤ 50 µA	≤ 50 µA	≤ 10 µA	≤ 80 µA	
Protected Against Polarity Reversal	yes	yes	yes	yes	
Short Circuit Protected	yes	PNP=yes, NPN=no	yes	yes	
Load Capacitance	≤ 0.1 µF	≤ 0.1 µF	≤ 0.5 µF	≤ 0.1 µF	
Repeat Accuracy R	≤ 5 %	≤ 5 %	≤ 15 %	≤ 5 %	
Ambient Temperature Range T _a	-25...+70 °C	0...+70 °C	0...+70 °C	25...+70 °C	
Operating Frequency f	2000 Hz	5000 Hz	2000 Hz	3000 Hz	
Function Indication	yes	yes	yes	yes	
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67	IP 67	
Housing Material	stainless steel	stainless steel	stainless steel	stainless steel	
Material of Sensing Face	POM	POM	POM	POM	
Connection	2 m cable PUR	cable with connector	cable	cable	
No. of Wires x Gauge	3 x 28 AWG		3 x 28 AWG	3 x 26 AWG	
Approvals	cULus			cULus	
Recommended Connector		C49 ANE-00-VY-050M			

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

Wiring Diagrams



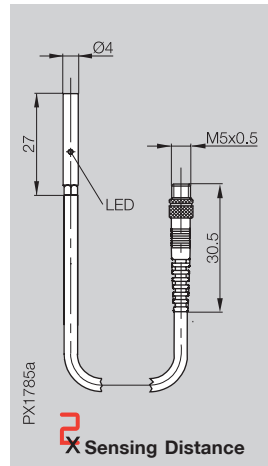
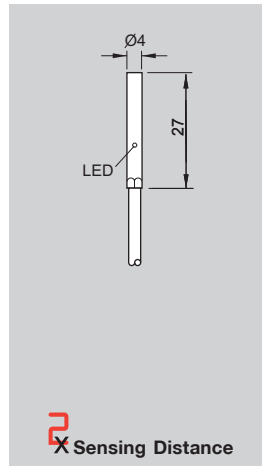
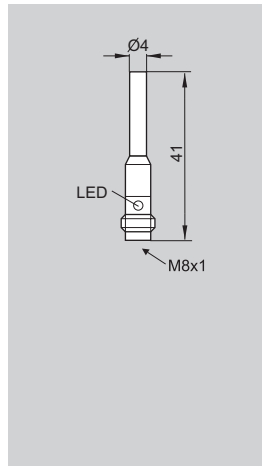
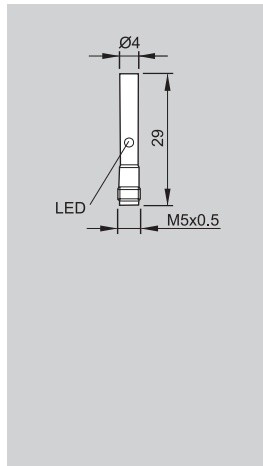
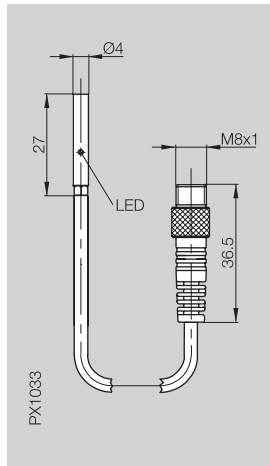
Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

DC 3-/4-Wire

Inductive Sensors

DC 3-/4-Wire
 Ø 4 mm
 s_n 0.8 mm, 1.5 mm

Ø 4 mm	Ø 4 mm	Ø 4 mm	Ø 4 mm	Ø 4 mm
flush	flush	flush	flush*	flush*
0.8 mm	0.8 mm	0.8 mm	1.5 mm	1.5 mm
0...0.6 mm	0...0.6 mm	0...0.65 mm	0...1.2 mm	0...1.2 mm



BES 516-3007-E4-C-S49-00,3	BES G04EC-PSC08B-S26G	BES 516-3007-E5-C-S49	BES 516-3007-G-E4-C-PU-05	BES 516-3007-G-E4-C-S26-00,2
BES 516-3017-E4-C-S49-00,3	BES G04EC-POC08B-S26G	BES 516-3017-E5-C-S49	BES 516-3017-G-E4-C-PU-05	

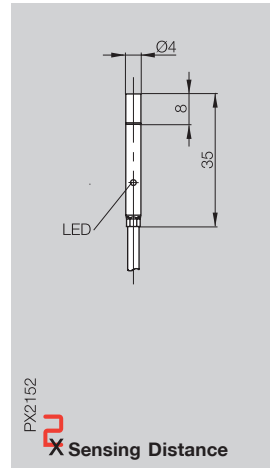
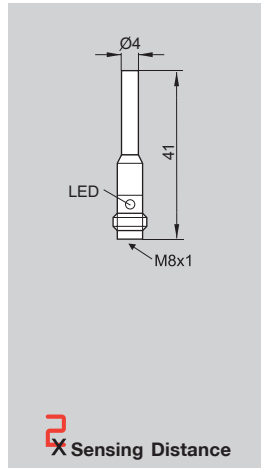
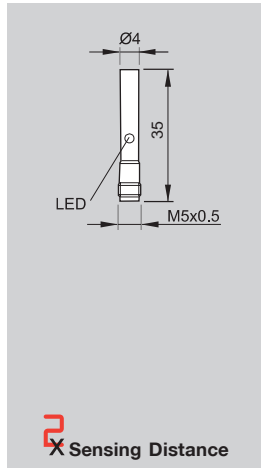
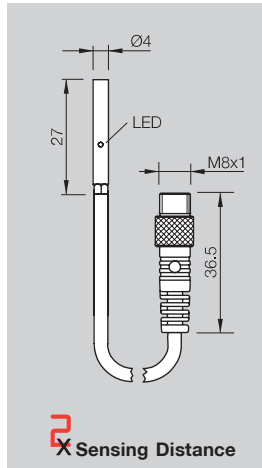
BES 516-3008-E4-C-S49-00,2	BES G04EC-NSC08B-S26G	BES 516-3008-E5-C-S49	BES 516-3008-G-E4-C-PU-05	
	BES G04EC-NOC08B-S26G		BES 516-3018-G-E4-C-PU-05	

24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc
10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
≤ 3.0 V	≤ 3.0 V	≤ 1.5 V	≤ 3.0 V	≤ 3.0 V
75 Vdc	75 Vdc	75 Vdc	75 Vdc	75 Vdc
100 mA	100 mA	100 mA	100 mA	100 mA
≤ 12 mA	≤ 12 mA	≤ 12 mA ≤ 5 mA	≤ 10 mA ≤ 3 mA	≤ 12 mA
≤ 80 µA	≤ 80 µA	≤ 80 µA	≤ 80 µA	≤ 80 µA
yes	yes	yes	yes	yes
yes	yes	yes	yes	yes
≤ 0.1 µF	≤ 0.1 µF	≤ 0.02 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
3000 Hz	3000 Hz	500 Hz	1800 Hz	3000 Hz
yes	yes	yes	yes	yes
IP 67	IP 67	IP 67	IP 67	IP 67
stainless steel	stainless steel	stainless steel	stainless steel	stainless steel
POM	POM	POM	POM	POM
cable with connector	connector	connector	cable	cable with connector
			3 x 26 AWG	
cULus	cULus	C49 ANE-00-VY-050M		cULus
BKS-_48	BKS-B 25/BKS-B 26			BKS-B 25...



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

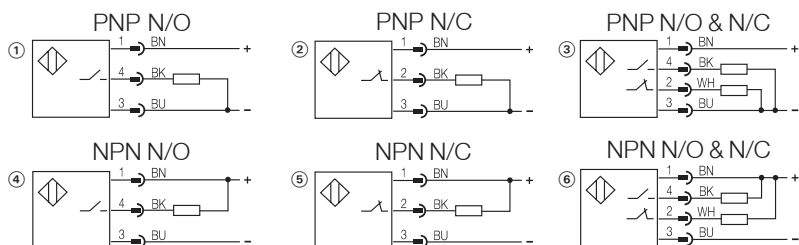
Housing Size	Ø 4 mm	Ø 4 mm	Ø 4 mm	Ø 4 mm
Mounting	flush*	flush*	flush*	non-flush*
Rated Operating Distance s _n	1.5 mm	1.5 mm	1.5 mm	5 mm
Assured Operating Distance s _a	0...1.2 mm	0...1.2 mm	0...1.2 mm	0...4.1 mm



PNP	Normally-open ①	BES 516-3007-G-E4-C-S49-00,2	BES G04ED-PSC15B-S26G	BES 516-3007-G-E5-C-S49	BES G04ED-PSC50F-EP05
	Normally-closed ②		BES G04ED-POC15B-S26G	BES 516-3017-G-E5-C-S49	BES G04ED-POC50F-EP05
NPN	Normally-open ④	BES 516-3008-G-E4-C-S49-00,2	BES G04ED-NSC15B-S26G	BES 516-3008-G-E5-C-S49	BES G04ED-NSC50F-EP05
	Normally-closed ⑥		BES G04ED-NOC15B-S26G	BES 516-3018-G-E5-C-S49	
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 V DC	
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 V DC	
Voltage Drop U _d at I _e	≤ 3.0 V	≤ 3.0 V	≤ 3.0 V	≤ 2.5 V	
Rated Insulation Voltage U _i	75 Vdc	75 Vdc	75 Vdc	75 V DC	
Load Current Capacity	100 mA	100 mA	100 mA	100 mA	
Current Consumption (closed/open)	≤ 10 mA/≤ 3 mA	≤ 10 mA	≤ 10 mA/≤ 3 mA	≤ 10 mA/≤ 8 mA	
Off-state Current I _r	≤ 80 µA	≤ 80 µA	≤ 80 µA	≤ 10 µA	
Protected Against Polarity Reversal	yes	yes	yes	yes	
Short Circuit Protected	yes	yes	yes	yes	
Load Capacitance	≤ 1.0 µF	≤ 0.2 µF	≤ 1.0 µF	≤ 0.5 µF	
Repeat Accuracy R	≤ 5 %	≤ 5 %	≤ 5 %	≤ 10 %	
Ambient Temperature Range T _a	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	
Operating Frequency f	1800 Hz	3000 Hz	1800 Hz	3000 Hz	
Function Indication	yes	yes	yes	yes	
Degree of Protection per IEC 60529	IP 67	IP 65	IP 67	IP 67	
Housing Material	stainless steel	stainless steel	stainless steel	stainless steel	
Material of Sensing Face	POM	POM	POM	POM	
Connection	cable with connector	connector	connector	cable	
No. of Wires x Gauge				3x26 AWG	
Approvals				cULus	
Recommended Connector	C49 ANE-00-VY-050M	BKS-B 25/BKS-B 26	C49 ANE-00-VY-050M		

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

Wiring Diagrams



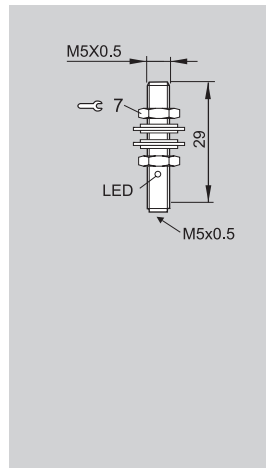
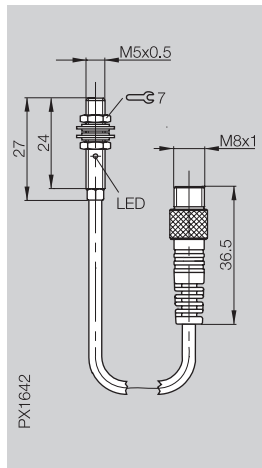
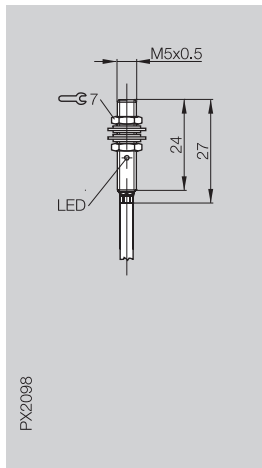
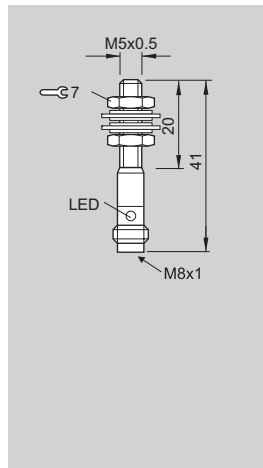
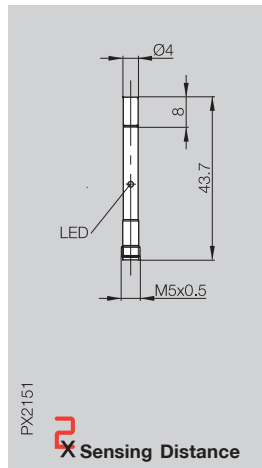
Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

DC 3-/4-Wire

Inductive Sensors

DC 3-/4-Wire
M5
s_n 0.8 mm, 5 mm

M5x0.5 non-flush*	M5x0.5 flush	M5x0.5 flush	M5x0.5 flush	M5x0.5 flush
5 mm	0.8 mm	0.8 mm	0.8 mm	0.8 mm
0...4.1 mm	0...0.65 mm	0...0.6 mm	0...0.6 mm	0...0.6 mm

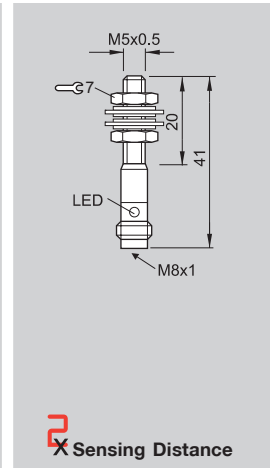
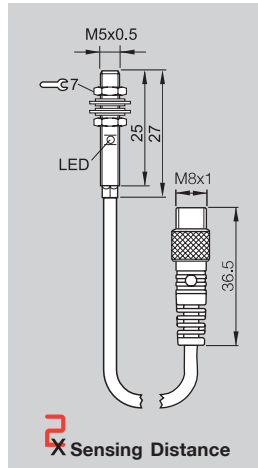
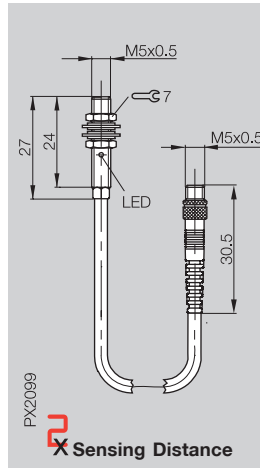
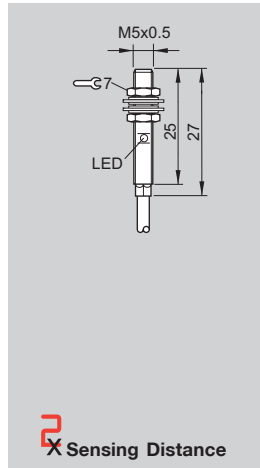


BES G04ED-PSC50F-S26G	BES 516-3005-E5-C-S49 BES 516-3022-E5-C-S49	BES 516-3005-E4-C-PU-05	BES 516-3005-E4-C-S49-00.3	BES M05EC-PSC08B-S26G BES M05EC-POC08B-S26G
	BES 516-3006-E5-C-S49			BES M05EC-NSC08B-S26G BES M05EC-NOC08B-S26G
24 V DC	24 Vdc	24 Vdc	24 Vdc	24 Vdc
10...30 V DC	10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
≤ 2.5 V	≤ 3.0 V	≤ 3.0 V	≤ 3.0 V	≤ 3.0 V
75 V DC	75 Vdc	75 Vdc	75 Vdc	75 Vdc
100 mA	150 mA	100 mA	100 mA	100 mA
≤ 10 mA/≤ 8 mA	≤ 10 mA/≤ 1.5 mA	≤ 12 mA	≤ 12 mA	≤ 10 mA
≤ 10 µA	≤ 50 µA	≤ 80 µA	≤ 80 µA	≤ 80 µA
yes	yes	yes	yes	yes
yes	yes	yes	yes	yes
≤ 0.5 µF	≤ 0.1 µF	≤ 0.2 µF	≤ 0.2 µF	≤ 0.1 µF
≤ 10 %	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
3000 Hz	1000 Hz	3000 Hz	3000 Hz	3000 Hz
yes	yes	yes	yes	yes
IP 67	IP 67	IP 67	IP 67	IP 67
stainless steel	stainless steel	stainless steel	stainless steel	stainless steel
POM	POM	POM	POM	POM
connector	connector	cable	cable with connector	connector
		3x26 AWG	3x26 AWG	
cULus		cULus	cULus	cULus
BKS-B 25/BKS-B 26	C49 ANE-00-VY-050M			BKS-B 25/BKS-B 26



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

Housing Size	M5x0.5	M5x0.5	M5x0.5	M5x0.5
Mounting	flush*	flush*	flush*	flush*
Rated Operating Distance s _n	1.5 mm	1.5 mm	1.5 mm	1.5 mm
Assured Operating Distance s _a	0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm

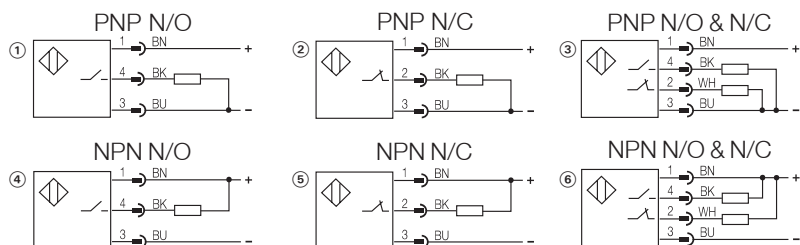


PNP	Normally-open ①	BES 516-3005-G-E4-C-PU-05	BES 516-3005-G-E4-C-S26-00,3	BES 516-3005-G-E4-C-S49-00,3	BES 516-3005-G-E5-C-S49
	Normally-closed ②	BES 516-3022-G-E4-C-PU-05		BES 516-3022-G-E4-C-S49-00,3	BES 516-3022-G-E5-C-S49
NPN	Normally-open ④	BES 516-3006-G-E4-C-PU-05			BES 516-3006-G-E5-C-S49
	Normally-closed ⑤	BES 516-3023-G-E4-C-PU-05			BES 516-3023-G-E5-C-S49

Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
Voltage Drop U _d at I _e	≤ 3.0 V	≤ 3.0 V	≤ 3.0 V	≤ 3.0 V
Rated Insulation Voltage U _i	75 Vdc	75 Vdc	75 Vdc	75 Vdc
Load Current Capacity	100 mA	100 mA	100 mA	100 mA
Current Consumption (closed/open)	≤ 10 mA/≤ 3 mA	≤ 12 mA	≤ 10 mA/≤ 3 mA	≤ 10 mA/≤ 3 mA
Off-state Current I _r	≤ 80 µA	≤ 80 µA	≤ 80 µA	≤ 80 µA
Protected Against Polarity Reversal	yes	yes	yes	yes
Short Circuit Protected	yes	yes	yes	yes
Load Capacitance	≤ 0.1 µF	≤ 0.2 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	1800 Hz	3000 Hz	1800 Hz	1800 Hz
Function Indication	yes	yes	yes	yes
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67	IP 67
Housing Material	stainless steel	stainless steel	stainless steel	stainless steel
Material of Sensing Face	POM	POM	POM	POM
Connection	cable	cable with connector	cable with connector	connector
No. of Wires x Gauge	3 x 26 AWG			
Approvals		cULus		
Recommended Connector		BKS-B 25...	C49 ANE-00-VY-050M	C49 ANE-00-VY-050M

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

Wiring Diagrams



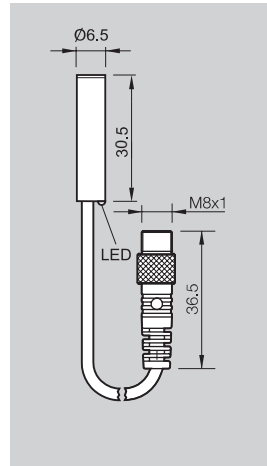
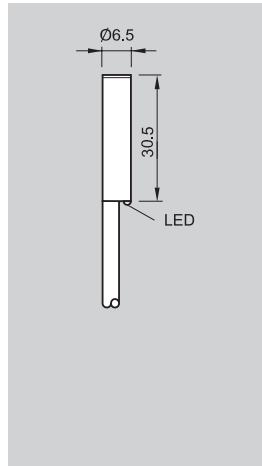
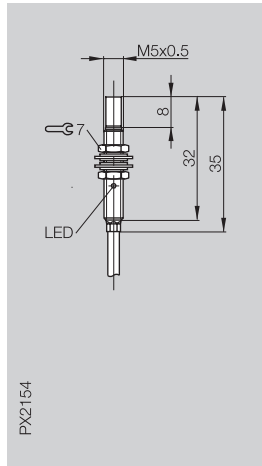
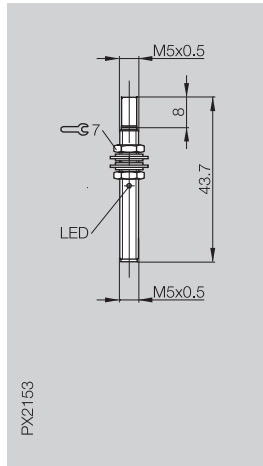
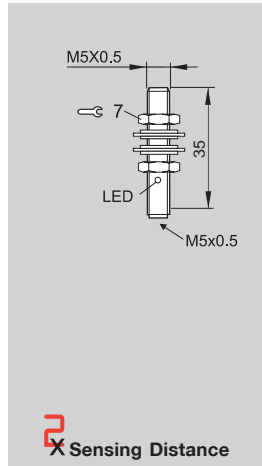
Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

DC 3-/4-Wire

Inductive Sensors

DC 3-/4-Wire
M5, Ø 6.5
S_n 1.5 mm, 5 mm

M5x0.5 flush*	M5x0.5 non-flush	M5x0.5 non-flush	Ø 6.5 mm flush	Ø 6.5 mm flush
1.5 mm	5 mm	5 mm	1.5 mm	1.5 mm
0...1.2 mm	0...4.1 mm	0...4.1 mm	0...1.2 mm	0...1.2 mm

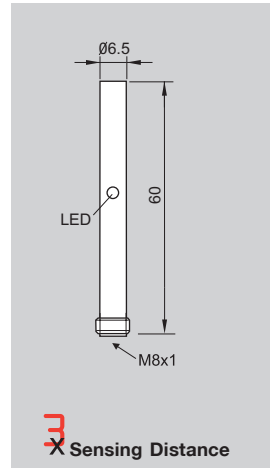
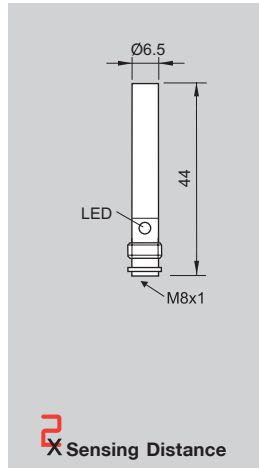
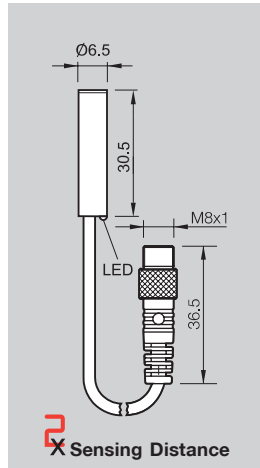
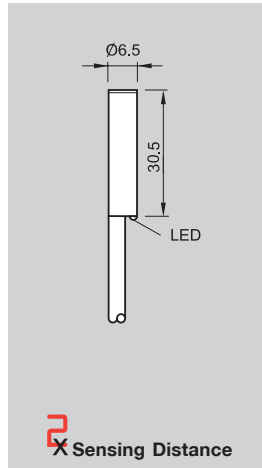


BES M05ED-PSC15B-S26G BES M05ED-POC15B-S26G	BES M05ED-PSC50F-S26G BES M05ED-POC50F-S26G	BES M05ED-PSC50F-EP05 BES M05ED-POC50F-EP05	BES 516-371-E4-C-03	BES 516-371-E4-C-S49-00,2
BES M05ED-NSC15B-S26G BES M05ED-NOC15B-S26G	BES M05ED-NSC50F-S26G	BES M05ED-NSC50F-EP05 BES M05ED-NOC50F-EP05	BES 516-372-E4-C-03	
24 Vdc	24 V DC	24 V DC	24 Vdc	24 Vdc
10...30 Vdc	10...30 V DC	10...30 V DC	10...30 Vdc	10...30 Vdc
≤ 3.0 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
75 Vdc	75 V DC	75 V DC	75 Vdc	75 Vdc
100 mA	100 mA	100 mA	200 mA	200 mA
≤ 10 mA	≤ 10 mA	≤ 10 mA	≤ 25 mA/≤ 12 mA	≤ 25 mA/≤ 12 mA
≤ 80 µA	≤ 10 µA	≤ 10 µA	≤ 80 µA	≤ 80 µA
yes	yes	yes	yes	yes
yes	yes	yes	yes	yes
≤ 0.2 µF	≤ 0.5 µF	≤ 0.5 µF	≤ 1.0 µF	≤ 1.0 µF
≤ 5 %	≤ 10 %	≤ 10 %	≤ 5 %	≤ 5 %
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
3000 Hz	3000 Hz	3000 Hz	1500 Hz	1500 Hz
yes	yes	yes	yes	yes
IP 65	IP 67	IP 67	IP 67	IP 67
stainless steel	stainless steel	stainless steel	stainless steel	stainless steel
POM	POM	POM	PBTP	PBT
connector	connector	cable, PUR	cable	cable with connector
	cULus	3x26 AWG	3 x 26 AWG	
BKS-B 25/BKS-B 26	BKS-B 25/BKS-B 26	cULus	cULus	cULus C49 ANE-00-VY-050M



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

Housing Size	Ø 6.5 mm	Ø 6.5 mm	Ø 6.5 mm	Ø 6.5 mm
Mounting	flush*	flush*	flush*	quasi-flush*
Rated Operating Distance s _n	2 mm	2 mm	2 mm	3 mm
Assured Operating Distance s _a	0...1.6 mm	0...1.6 mm	0...1.6 mm	0...2.4 mm

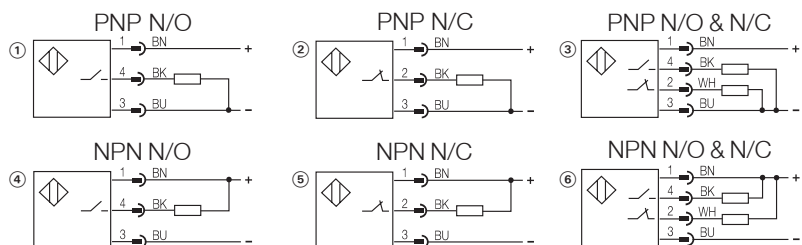


PNP	Normally-open ①	BES 516-371-G-E4-C-PU-05	BES 516-371-G-E4-C-S49-00,2	BES 516-371-G-E5-C-S49	BES G06MI-PSC30B-S49G
	Normally-closed ②	BES 516-3021-G-E4-C-PU-05		BES 516-3021-G-E5-C-S49	BES G06MI-POC30B-S49G
NPN	Normally-open ④	BES 516-372-G-E4-C-PU-05	BES 516-372-G-E4-C-S49-00,2	BES 516-372-G-E5-C-S49	BES G06MI-NSC30B-S49G
	Normally-closed ⑤	BES 516-3025-G-E4-C-PU-05		BES 516-3025-G-E5-C-S49	BES G06MI-NOC30B-S49G

Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
Voltage Drop U _d at I _e	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V	≤ 2.0 V
Rated Insulation Voltage U _i	75 Vdc	75 Vdc	75 Vdc	75 Vdc
Load Current Capacity	200 mA	200 mA	200 mA	200 mA
Current Consumption (closed/open)	≤ 25 mA/≤ 12 mA	≤ 25 mA/≤ 12 mA	≤ 25 mA/≤ 12 mA	≤ 12 mA/≤ 10 mA
Off-state Current I _r	≤ 80 µA	≤ 80 µA	≤ 80 µA	≤ 100 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	1000 Hz	1000 Hz	1000 Hz	1000 Hz
Function Indication	yes	yes	yes	yes
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67	IP 67
Housing Material	stainless steel	stainless steel	stainless steel	chrome plated brass
Material of Sensing Face	PA 12	PA 12	PA 12	PBTP
Connection	cable	cable with connector	connector	connector
No. of Wires x Gauge	3 x 26 AWG			
Approvals	cULus	cULus	cULus	
Recommended Connector		C49 ANE-00-VY-050M	C49 ANE-00-VY-050M	C49 ANE-00-VY-050M

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

Wiring Diagrams



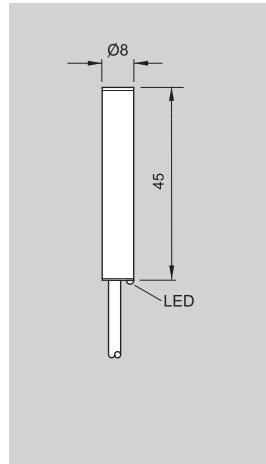
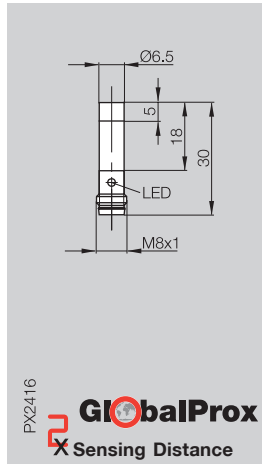
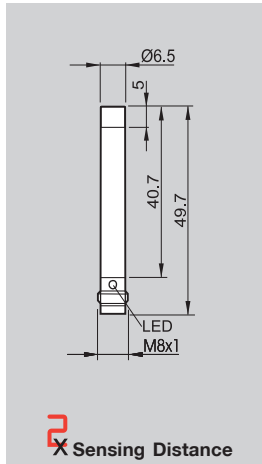
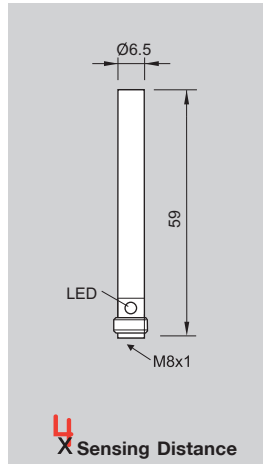
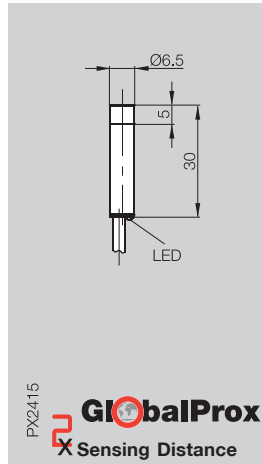
Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

DC 3-/4-Wire

Inductive Sensors

DC 3-/4-Wire
 Ø 6.5 mm, Ø 8 mm
 S_n 1.5 mm, 4 mm

Ø 6.5 mm non-flush*	Ø 6.5mm quasi-flush*	Ø 6.5 mm non-flush*	Ø 6.5 mm non-flush*	Ø 8 mm flush
4 mm	4 mm	4 mm	4 mm	1.5 mm
0...3.2 mm	0...2.9 mm	0...3.2 mm	0...3.2 mm	0...1.2 mm



BES G06ED-PSC40F-BV02 BES G06ED-POC40F-BV02	BES G06MI-PSC40B-S49G	BES G06EF-PSC40F-S49G	BES G06EB-PSC40F-S49G BES G06EB-POC40F-S49G	BES G08EG-PSC15B-BV05
BES G06ED-NSC40F-BV02 BES G06ED-NOC40F-BV02	BES G06MI-NSC40B-S49G		BES G06EB-NSC40F-S49G BES G06EB-NOC40F-S49G	
24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc
10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
≤ 2.5 V	≤ 2.8 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
75 Vdc	75 Vdc	75 Vdc	75 Vdc	250 Vac
200 mA	200 mA	200 mA	200 mA	200 mA
≤ 10 mA/≤ 3 mA	≤ 10 mA/≤ 8 mA	≤ 12 mA/≤ 10 mA	≤ 10 mA/≤ 3 mA	≤ 9 mA
≤ 10 µA	≤ 10 µA	≤ 10 µA	≤ 10 µA	≤ 20 µA
yes	yes	yes	yes	yes
yes	yes	yes	yes	yes
≤ 0.5 µF	≤ 1.0 µF	≤ 1 µF	≤ 0.5 µF	≤ 0.5 µF
≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
-25...+70 °C	0...+60 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
1500 Hz	700 Hz	5000 Hz	1500 Hz	3000 Hz
yes	yes	yes	yes	yes
IP 67	IP 67	IP 67	IP 67	IP 68 per BWN Pr. 20
stainless steel	nickel plated brass	stainless steel	stainless steel	stainless steel
PA 12	PBTP	PBT	PA 12	PA 12
cable	connector	connector	connector	cable
3 x 26 AWG				3 x 26 AWG
cULus	cULus		cULus	cULus
	C49 ANE-00-VY-050M	C49 ANE-00-VY-050M	C49 ANE-00-VY-050M	



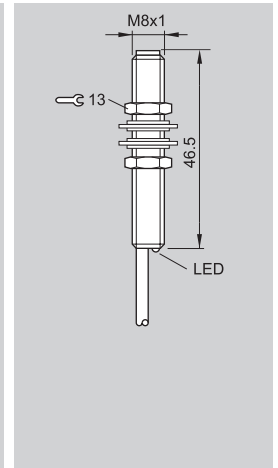
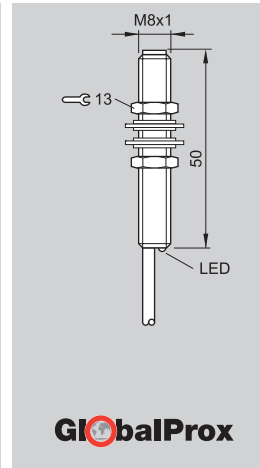
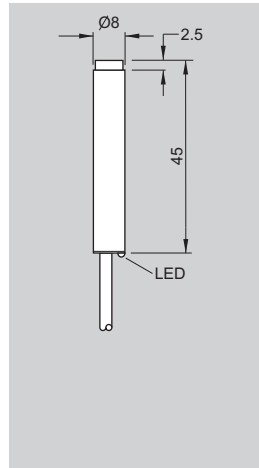
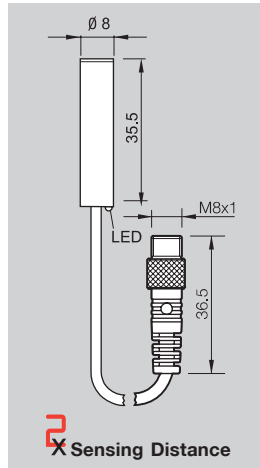
– For mounting brackets & accessories see section 7.
 – For mating connectors see section 6.

Inductive Sensors

DC 3-/4-Wire
 Ø 8 mm, M8
 s_n 1.5 mm, 2 mm, 2.5 mm

DC 3-/4-Wire

Housing Size	Ø 8 mm	Ø 8 mm	M8x1	M8x1
Mounting	flush*	non-flush	flush	flush
Rated Operating Distance s _n	2 mm	2.5 mm	1.5 mm	1.5 mm
Assured Operating Distance s _a	0...1.6 mm	0...2 mm	0...1.2 mm	0...1.2 mm



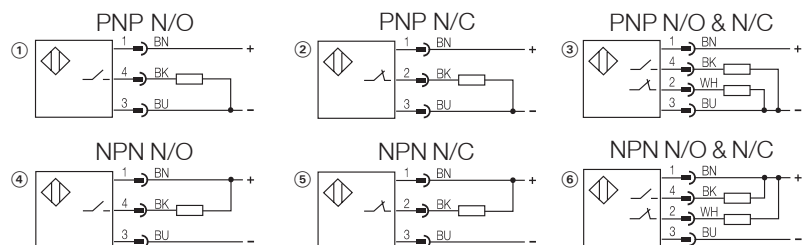
PNP	Normally-open ①	BES 516-369-G-SA 2-S49-	BES 516-396-E0-C-05	BES M08MI-PSC15B-BV03	BES 516-324-E0-C-PU-05
	Normally-closed ②	BES 516-3013-G-SA 2-S49-		BES M08MI-POC15B-BV03	BES 516-377-E0-C-PU-03

NPN	Normally-open ④		BES 516-397-E0-C-05	BES M08MI-NSC15B-BV03	BES 516-343-E0-C-PU-05
	Normally-closed ⑤				BES 516-378-E0-C-PU-05

Rated Operational Voltage U _B	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	12...30 Vdc	10...30 Vdc
Voltage Drop U _d at I _B	≤ 3.5 V	≤ 2.5 V	≤ 2.5 V	≤ 1.5 V
Rated Insulation Voltage U _i	75 Vdc	75 Vdc	75 Vdc	250 Vac
Load Current Capacity	130 mA	200 mA	100 mA	200 mA
Current Consumption (closed/open)	≤ 25 mA/≤ 12 mA	≤ 25 mA/≤ 12 mA	≤ 10 mA/≤ 5 mA	≤ 8 mA/≤ 1 mA
Off-state Current I _r	≤ 80 µA	≤ 80 µA	≤ 20 µA	≤ 10 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	≤ 0.5 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	800 Hz	1000 Hz	1000 Hz	3000 Hz
Function Indication	yes	yes	yes	yes
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67	IP 67
Housing Material	nickel plated brass	nickel plated brass	nickel plated brass	stainless steel
Material of Sensing Face	PBT	PA 12	PA 12	PBTP
Connection	cable with connector	cable	cable	cable
No. of Wires x Gauge		3 x 26 AWG	3 x 26 AWG	3 x 26 AWG
Approvals	cULus	cULus	cULus	cULus
Recommended Connector	C49 ANE-00-VY-050M			

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

Wiring Diagrams



Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

DC 3-/4-Wire

Inductive Sensors

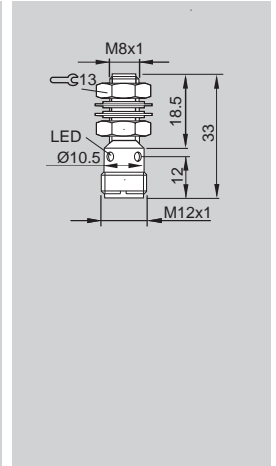
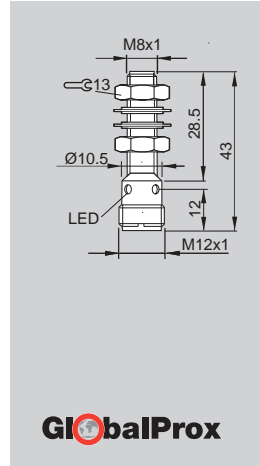
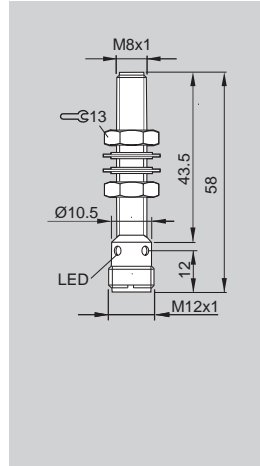
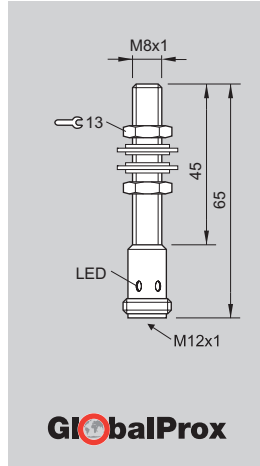
DC 3-/4-Wire
M8
S_n 1.5 mm

M8x1 flush 1.5 mm 0...1.2 mm	M8x1 flush 1.5 mm 0...1.2 mm	M8x1 flush 1.5 mm 0...1.2 mm	M8x1 flush 1.5 mm 0...1.2 mm
BES 516-324-E0-C-S49-00,2 BES 516-377-E0-C-S49-00,2	BES M08EF-PSC15B-BP02-003 BES M08EF-POC15B-BP02-003	BES 516-324-E4-C-03 BES 516-377-E4-C-03	BES 516-324-E4-C-S4-00,5
	BES M08EF-NSC15B-BP02-003 BES M08EF-NOC15B-BP02-003	BES 516-343-E4-C-03 BES 516-378-E4-C-PU-05	
24 Vdc 10...30 Vdc ≤ 1.5 V 250 Vac 200 mA ≤ 8 mA/≤ 1 mA ≤ 10 μA yes yes ≤ 0.5 μF	10...30 Vdc ≤ 2.5 V 250 Vdc 200 mA ≤ 9 mA	24 Vdc 10...30 Vdc ≤ 2.5 V 75 Vdc 200 mA ≤ 25 mA/≤ 12 mA ≤ 80 μA yes yes ≤ 1.0 μF	24 Vdc 10...30 Vdc ≤ 2.5 V 75 Vdc 200 mA ≤ 25 mA/≤ 12 mA ≤ 80 μA yes yes ≤ 1.0 μF
≤ 5 % -25...+70 °C 3000 Hz yes IP 67 stainless steel PBTP cable with connector	≤ 5 % -25...+70 °C 3000 Hz yes IP 68 per BWN Pr. 20 stainless steel PA 12 cable 3x26 AWG cULus	≤ 5 % -25...+70 °C 1500 Hz yes IP 67 stainless steel PBTP cable 3 x 26 AWG cULus	≤ 5 % -25...+70 °C 1500 Hz yes IP 67 stainless steel PBT cable with connector cULus
C49 ANE-00-VY-050M			C04 AEL-00-VY-050M



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

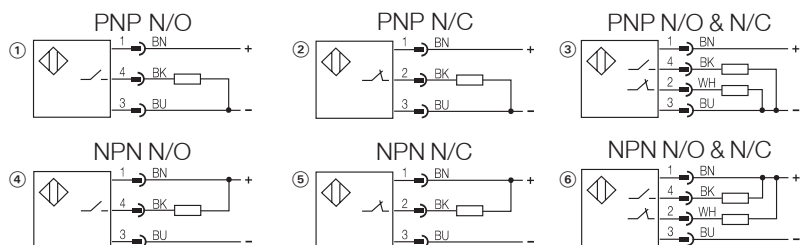
Housing Size	M8x1	M8x1	M8x1	M8x1
Mounting	flush	flush	flush	flush
Rated Operating Distance s _n	1.5 mm	1.5 mm	1.5 mm	1.5 mm
Assured Operating Distance s _a	0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm



PNP	Normally-open ①	BES M08MH1-PSC15B-S04G	BES M08EH-PSC15B-S04G	BES M08EE-PSC15B-S04G-003	BES M08EC-PSC15B-S04G
	Normally-closed ②	BES M08MH1-POC15B-S04G	BES M08EH-POC15B-S04G	BES M08EE-POC15B-S04G-003	
NPN	Normally-open ④	BES M08MH1-NSC15B-S04G	BES M08EH-NSC15B-S04G	BES M08EE-NSC15B-S04G-003	
	Normally-closed ⑤	BES M08MH1-NOC15B-S04G	BES M08EH-NOC15B-S04G	BES M08EE-NOC15B-S04G-003	
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc	
Supply Voltage U _B	12...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc	
Voltage Drop U _d at I _e	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V	
Rated Insulation Voltage U _i	75 Vdc	250 AC	250 AC	250 AC	
Load Current Capacity	200 mA	200 mA	200 mA	200 mA	
Current Consumption (closed/open)	≤ 10 mA/≤ 5 mA	PNP ≤ 9 mA, NPN ≤ 18 mA	PNP ≤ 9 mA, NPN ≤ 18 mA	PNP ≤ 9 mA, NPN ≤ 18 mA	
Off-state Current I _r	≤ 20 µA	≤ 20 µA	≤ 20 µA	≤ 20 µA	
Protected Against Polarity Reversal	yes	yes	yes	yes	
Short Circuit Protected	yes	yes	yes	yes	
Load Capacitance	≤ 1.0 µF	≤ 0.5 µF	≤ 0.5 µF	≤ 0.5 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	700 Hz	3000 Hz	1000 Hz	3000 Hz	
Function Indication	yes	yes	yes	yes	
Degree of Protection per IEC 60529	IP 67	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	
Housing Material	nickel plated brass	stainless steel	stainless steel	stainless steel	
Material of Sensing Face	PBT	PA 12	PA 12	PA 12	
Connection	connector	connector	connector	connector	
No. of Wires x Gauge					
Approvals	cULus	cULus	cULus	cULus	
Recommended Connector	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	

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

Wiring Diagrams



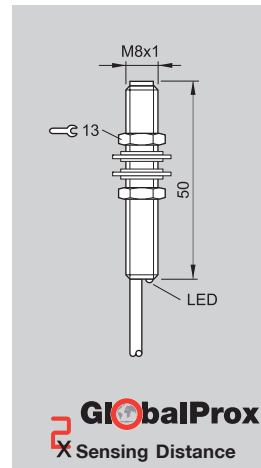
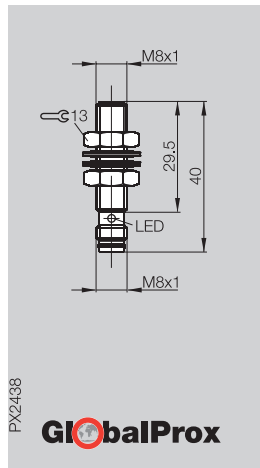
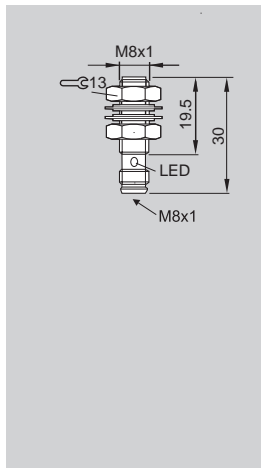
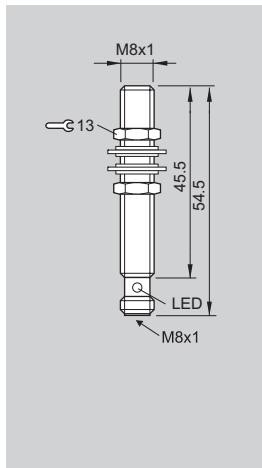
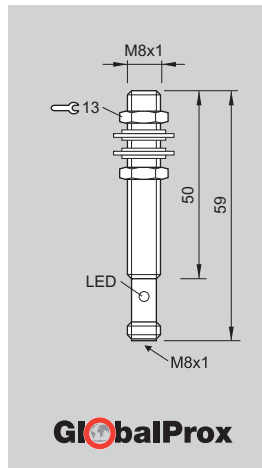
Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

DC 3-/4-Wire

Inductive Sensors

DC 3-/4-Wire
M8
s_n 1.5 mm, 2 mm

M8x1 flush 1.5 mm 0...1.2 mm	M8x1 flush 1.5 mm 0...1.2 mm	M8x1 flush 1.5 mm 0...1.2 mm	M8x1 flush 1.5 mm 0...1.2 mm	M8x1 flush* 2 mm 0...1.6 mm
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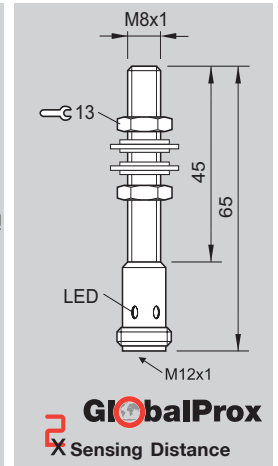
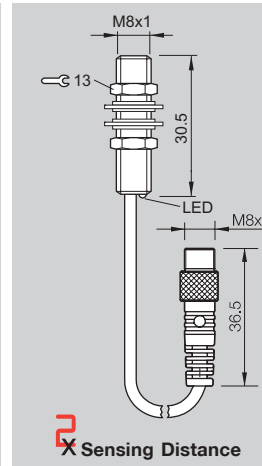
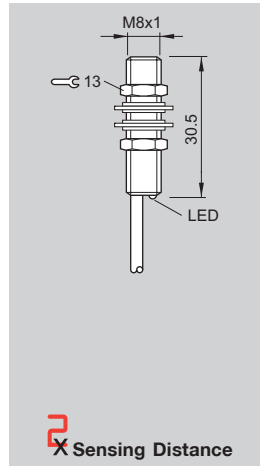
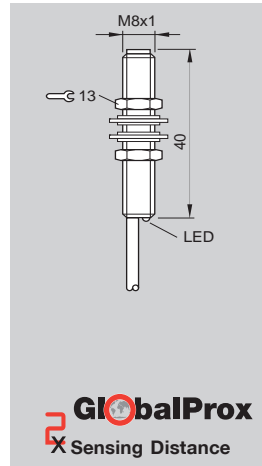


BES M08MI-PSC15B-S49G	BES 516-324-S49-C BES 516-377-S49-C	BES M08EC-PSC15B-S49G BES M08EC-POC15B-S49G	BES M08EE-PSC15B-S49G-003 BES M08EE-POC15B-S49G-003	BES M08MI-PSC20B-BV03
BES M08MI-NSC15B-S49G	BES 516-343-S49-C BES 516-378-S49-C	BES M08EC-NSC15B-S49G	BES M08EE-NSC15B-S49G-003 BES M08EE-NOC15B-S49G-003	BES M08MI-NSC20B-BV03
24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc
12...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc	12...30 Vdc
≤ 2.5 V	≤ 1.5 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
75 Vdc	75 Vdc	250 AC	250 AC	75 Vdc
200 mA	200 mA	200 mA	200 mA	200 mA
≤ 10 mA/≤ 5 mA	≤ 8 mA/≤ 1 mA	PNP ≤ 9 mA, NPN ≤ 18 mA	PNP ≤ 9 mA, NPN ≤ 18 mA	≤ 10 mA/≤ 5 mA
≤ 20 µA	≤ 10 µA	≤ 20 µA	≤ 20 µA	≤ 20 µA
yes	yes	yes	yes	yes
yes	yes	yes	yes	yes
≤ 1.0 µF	≤ 0.5 µF	≤ 0.5 µF	≤ 0.5 µF	≤ 1.0 µF
≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
700 Hz	3000 Hz	3000 Hz	1000 Hz	700 Hz
IP 67	IP 67	IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 67
nickel plated brass	stainless steel	stainless steel	stainless steel	nickel plated brass
PBT	PBTP	PA 12	PA 12	PBT
connector	connector	connector	connector	cable
cULus	cULus	cULus	cULus	3 x 22 AWG
C49 ANE-00-VY-050M	C49 ANE-00-VY-050M	C49 ANE-00-VY-050M	C49 ANE-00-VY-050M	cULus



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

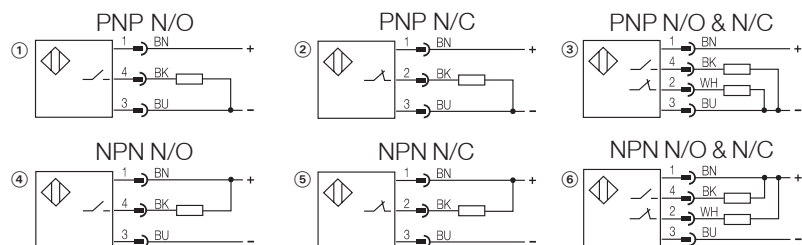
Housing Size	M8x1	M8x1	M8x1	M8x1
Mounting	flush*	flush*	flush*	flush*
Rated Operating Distance s _n	2 mm	2 mm	2 mm	2 mm
Assured Operating Distance s _a	0...1.6 mm	0...1.6 mm	0...1.6 mm	0...1.6 mm



PNP	Normally-open ①	BESM08EF-PSC20B-BV02-003	BES 516-324-G-E4-C-03	BES516-324-G-E4-C-S49-00,3	BES M08MH1-PSC20B-S04G
	Normally-closed ②	BESM08EF-POC20B-BV02-003	BES 516-377-G-E4-C-03	BES516-377-G-E4-C-S49-00,3	
NPN	Normally-open ④	BESM08EF-NSC20B-BV02-003	BES 516-343-G-E4-C-03		BES M08MH1-NSC20B-S04G
	Normally-closed ⑤	BESM08EF-NOC20B-BV02-003	BES 516-378-G-E4-C-03		
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...30 Vdc	12...30 Vdc
Voltage Drop U _d at I _e	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
Rated Insulation Voltage U _i	250 Vdc	75 Vdc	75 Vdc	75 Vdc	75 Vdc
Load Current Capacity	200 mA	200 mA	200 mA	200 mA	200 mA
Current Consumption (closed/open)	≤ 9 mA/≤ 3 mA	≤ 25 mA/≤ 12 mA	≤ 25 mA/≤ 12 mA	≤ 25 mA/≤ 12 mA	≤ 10 mA/≤ 5 mA
Off-state Current I _r	≤ 20 μA	≤ 80 μA	≤ 80 μA	≤ 80 μA	≤ 20 μA
Protected Against Polarity Reversal	yes	yes	yes	yes	yes
Short Circuit Protected	yes	yes	yes	yes	yes
Load Capacitance	≤ 0.5 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	700 Hz	1000 Hz	1000 Hz	1000 Hz	700 Hz
Function Indication	yes	yes	yes	yes	yes
Degree of Protection per IEC 60529	IP 67 per BWN Pr. 20	IP 67	IP 67	IP 67	IP 67
Housing Material	stainless steel	stainless steel	stainless steel	stainless steel	nickel plated brass
Material of Sensing Face	PA 12	PBTP	PBT	PBT	PBT
Connection	cable	cable	cable with connector	connector	connector
No. of Wires x Gauge	3 x 26 AWG	3 x 26 AWG			
Approvals	cULus	cULus	cULus	cULus	cULus
Recommended Connector			C49 ANE-00-VY-050M	C04 AEL-00-VY-050M	

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

Wiring Diagrams



Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

DC 3-/4-Wire

Inductive Sensors

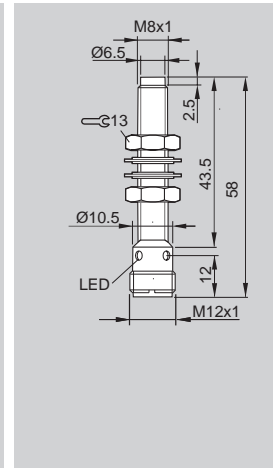
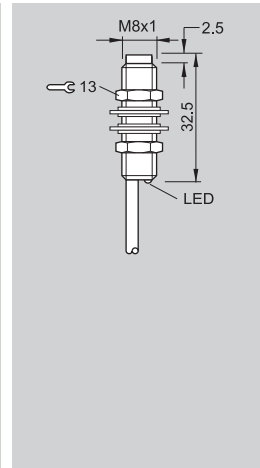
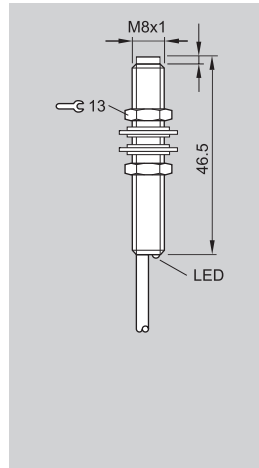
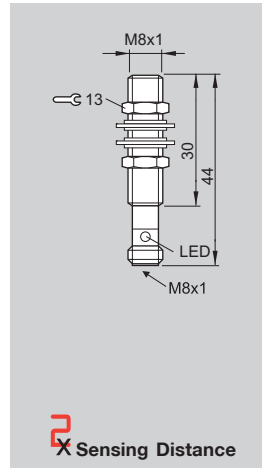
DC 3-/4-Wire
M8
S_n 2 mm

M8x1 flush* 2 mm 0...1.6 mm	M8x1 flush* 2 mm 0...1.6 mm	M8x1 flush* 2 mm 0...1.6 mm	M8x1 flush* 2 mm 0...1.6 mm	M8x1 flush* 2 mm 0...1.6 mm
2 X Sensing Distance	2 GlobalProx X Sensing Distance	2 GlobalProx X Sensing Distance	2 X Sensing Distance	2 GlobalProx X Sensing Distance
BES M08EH-PSC20B-S04G	BES M08EE-PSC20B-S04G-003 BES M08EE-POC20B-S04G-003	BES M08MI-PSC20B-S49G	BES 516-324-G-S49-C	BES M08EE-PSC20B-S49G-003 BES M08EE-POC20B-S49G-003
	BES M08EE-NSC20B-S04G-003 BES M08EE-NOC20B-S04G-003	BES M08MI-NSC20B-S49G		BES M08EE-NSC20B-S49G-003 BES M08EE-NOC20B-S49G-003
24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc
10...30 Vdc	10...30 Vdc	12...30 Vdc	10...30 Vdc	10...30 Vdc
≤ 2.5 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
250 Vdc	250 Vdc	75 Vdc	75 Vdc	250 Vdc
200 mA	200 mA	200 mA	200 mA	200 mA
≤ 9 mA	≤ 9 mA	≤ 10 mA/≤ 5 mA	≤ 25 mA/≤ 12 mA	≤ 9 mA
≤ 20 µA	≤ 20 µA	≤ 20 µA	≤ 80 µA	≤ 20 µA
yes	yes	yes	yes	yes
yes	yes	yes	yes	yes
≤ 0.5 µF	≤ 0.5 µF	≤ 1.0 µF	≤ 1.0 µF	≤ 0.5 µF
≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
1500 Hz	700 Hz	700 Hz	1000 Hz	700 Hz
yes	yes	yes	yes	yes
IP 68 per BWN Pr. 20	IP 68 per BWN Pr. 20	IP 67	IP 67	IP 68 per BWN Pr. 20
stainless steel	stainless steel	nickel plated brass	stainless steel	stainless steel
PA 12	PA 12	PBT	PBTP	PA 12
connector	connector	connector	connector	connector
cULus	cULus	cULus	cULus	cULus
C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C49 ANE-00-VY-050M	C49 ANE-00-VY-050M	C49 ANE-00-VY-050M



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

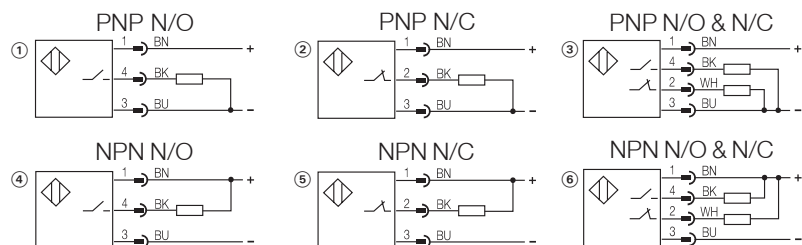
Housing Size	M8x1	M8x1	M8x1	M8x1
Mounting	flush*	non-flush	non-flush	non-flush
Rated Operating Distance s _n	2 mm	2.5 mm	2.5 mm	2.5 mm
Assured Operating Distance s _a	0...1.6 mm	0...2 mm	0...2 mm	0...2 mm



PNP	Normally-open ①	BES 516-324-G-E5-C-S49	BES 516-383-E0-C-05	BES 516-383-E4-C-03	BES M08EG-PSC25F-S04G
	Normally-closed ②	BES 516-377-G-E5-C-S49			BES M08EG-POC25F-S04G
NPN	Normally-open ④	BES 516-343-G-E5-C-S49	BES 516-384-E0-C-05	BES 516-384-E4-C-03	BES M08EG-NSC25F-S04G
	Normally-closed ⑤	BES 516-378-G-E5-C-S49			
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...30 Vdc	10...30 Vdc
Voltage Drop U _d at I _e	≤ 2.5 V	≤ 1.5 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
Rated Insulation Voltage U _i	75 Vdc	250 Vac	75 Vdc	250 Vdc	250 Vdc
Load Current Capacity	200 mA	200 mA	200 mA	200 mA	200 mA
Current Consumption (closed/open)	≤ 25 mA/≤ 12 mA	≤ 8 mA/≤ 1 mA	≤ 25 mA/≤ 12 mA	≤ 25 mA/≤ 12 mA	PNP ≤ 9 mA, NPN ≤ 18 mA
Off-state Current I _r	≤ 80 µA	≤ 10 µA	≤ 80 µA	≤ 80 µA	≤ 20 µA
Protected Against Polarity Reversal	yes	yes	yes	yes	yes
Short Circuit Protected	yes	yes	yes	yes	yes
Load Capacitance	≤ 1.0 µF	≤ 0.5 µF	≤ 1.0 µF	≤ 1.0 µF	≤ 0.5 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	1000 Hz	1500 Hz	1000 Hz	2000 Hz	2000 Hz
Function Indication	yes	yes	yes	yes	yes
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67	IP 67	IP 68 per BWN Pr. 20
Housing Material	stainless steel	stainless steel	stainless steel	stainless steel	stainless steel
Material of Sensing Face	PBTP	PBTP	PVDF	PA 12	PA 12
Connection	connector	cable	cable	connector	connector
No. of Wires x Gauge		3 x 26 AWG	3 x 26 AWG		
Approvals	cULus	cULus	cULus	cULus	cULus
Recommended Connector	C49 ANE-00-VY-050M				C04 AEL-00-VY-050M

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

Wiring Diagrams

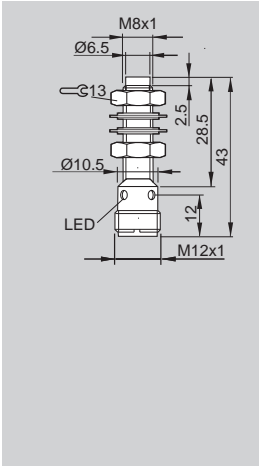
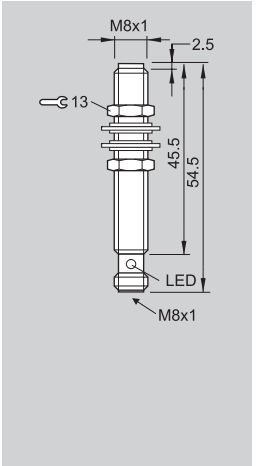
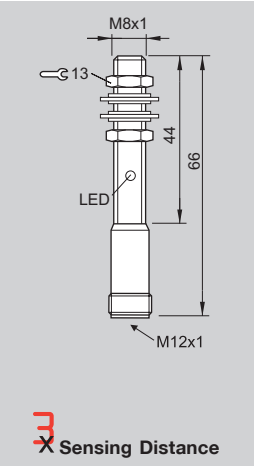
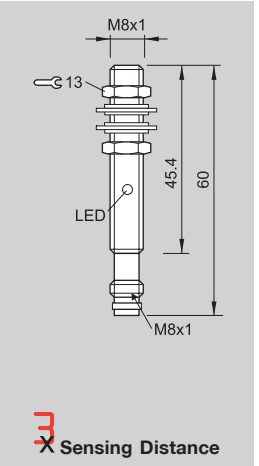
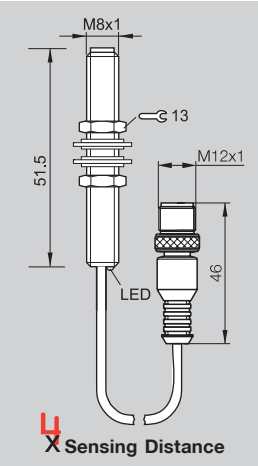


Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

DC 3-/4-Wire

Inductive Sensors

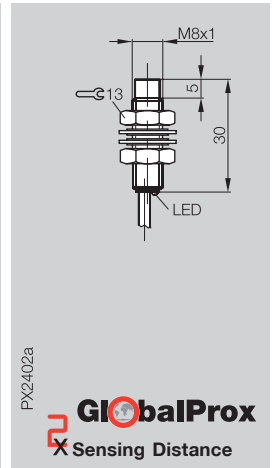
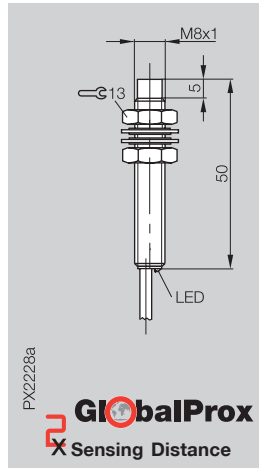
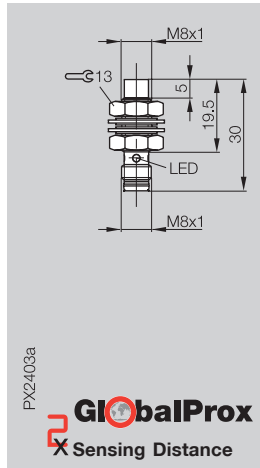
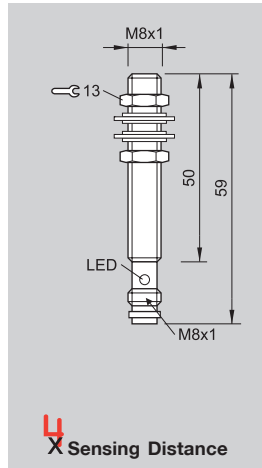
DC 3-/4-Wire
M8
S_n 2.5 mm, 3 mm, 4 mm

M8x1 non-flush 2.5 mm 0...2 mm	M8x1 non-flush 2.5 mm 0...2 mm	M8x1 quasi-flush* 3 mm 0...2.4 mm	M8x1 quasi-flush* 3 mm 0...2.4 mm	M8x1 quasi-flush* 4 mm 0...2.9 mm
				
BES M08EE-PSC25F-S04G	BES 516-383-S49-C	BES M08MH1-PSC30B-S04G	BES M08MH1-PSC30B-S49G	BES M08MI-PSC40B-BP00,2-GS04
BES M08EE-NSC25F-S04G		BES M08MH1-NSC30B-S04G	BES M08MH1-NSC30B-S49G	BES M08MI-NSC40B-BP00,2-GS04
24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc
10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
≤ 2.5 V	≤ 1.5 V	≤ 2.0 V	≤ 2.0 V	≤ 2.8 V
250 Vdc	75 Vdc	75 Vdc	75 Vdc	75 Vdc
200 mA	200 mA	200 mA	200 mA	200 mA
≤ 9 mA	≤ 8 mA/≤ 1 mA	≤ 12 mA/≤ 10 mA	≤ 12 mA/≤ 10 mA	≤ 10 mA/≤ 8 mA
≤ 20 µA	≤ 10 µA	≤ 100 µA	≤ 100 µA	≤ 10 µA
yes	yes	yes	yes	yes
yes	yes	yes	yes	yes
≤ 0.5 µF	≤ 0.5 µF	≤ 1.0 µF	≤ 1.0 µF	≤ 1 µF
≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	0...+60 °C
2000 Hz	1500 Hz	1000 Hz	1000 Hz	800 Hz
yes	yes	yes	yes	yes
IP 68 per BWN Pr. 20	IP 67	IP 67	IP 67	IP 67
stainless steel	stainless steel	chrome plated brass	chrome plated brass	nickel plated brass
PA 12	PBTP	PBTP	PBTP	PBTP
connector	connector	connector	connector	cable with connector
cULus	cULus			cULus
C04 AEL-00-VY-050M	C49 ANE-00-VY-050M	C04 AEL-00-VY-050M	C49 ANE-00-VY-050M	C04 AEL-00-VY-050M



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

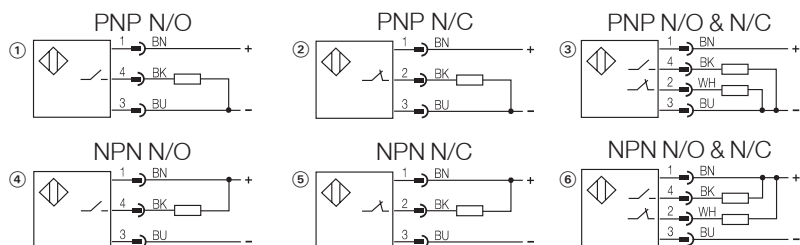
Housing Size	M8x1	M8x1	M8x1	M8x1
Mounting	quasi-flush*	non-flush*	non-flush*	non-flush*
Rated Operating Distance s _n	4 mm	4 mm	4 mm	4 mm
Assured Operating Distance s _a	0...2.9 mm	0...3.2 mm	0...3.2 mm	0...3.2 mm



PNP	Normally-open ①	BES M08MI-PSC40B-S49G	BES M08EB-PSC40F-S49G	BES M08EG-PSC40F-BV02	BES M08ED-PSC40F-BV02
	Normally-closed ②		BES M08EB-POC40F-S49G	BES M08EG-POC40F-BV02	BES M08ED-POC40F-BV02
NPN	Normally-open ④		BES M08EB-NSC40F-S49G	BES M08EG-NSC40F-BV02	BES M08ED-NSC40F-BV02
	Normally-closed ⑤	BES M08MI-NSC40B-S49G	BES M08EB-NOC40F-S49G	BES M08EG-NOC40F-BV02	BES M08ED-NOC40F-BV02
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...30 Vdc	12...30 Vdc	12...30 Vdc	12...30 Vdc	12...30 Vdc
Voltage Drop U _d at I _e	≤ 2.8 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
Rated Insulation Voltage U _i	75 Vdc	250 Vac	250 Vac	250 Vac	250 Vac
Load Current Capacity	200 mA	200 mA	200 mA	200 mA	200 mA
Current Consumption (closed/open)	≤ 10 mA / ≤ 8 mA	≤ 9 mA / ≤ 3 mA	≤ 10 mA / ≤ 3 mA	≤ 10 mA / ≤ 3 mA	≤ 9 mA / ≤ 3 mA
Off-state Current I _r	≤ 10 μA	≤ 20 μA	≤ 10 μA	≤ 10 μA	≤ 20 μA
Protected Against Polarity Reversal	yes	yes	yes	yes	yes
Short Circuit Protected	yes	yes	yes	yes	yes
Load Capacitance	≤ 1.0 μF	≤ 0.5 μF	≤ 0.5 μF	≤ 0.5 μF	≤ 0.5 μF
Repeat Accuracy R	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
Ambient Temperature Range T _a	0...+60 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
Operating Frequency f	800 Hz	1500 Hz	1500 Hz	1500 Hz	1500 Hz
Function Indication	yes	yes	yes	yes	yes
Degree of Protection per IEC 60529	IP 67	IP 68	IP 68	IP 68	IP 68
Housing Material	nickel plated brass	stainless steel	stainless steel	stainless steel	stainless steel
Material of Sensing Face	PBTP	PA 12	PBT	PA 12	PA 12
Connection	connector	connector			
No. of Wires x Gauge			3 x 26 AWG	3 x 26 AWG	3 x 26 AWG
Approvals	cULus	cULus	cULus	cULus	cULus
Recommended Connector	C49 ANE-00-VY-050M	C49 ANE-00-VY-050M			

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

Wiring Diagrams



Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

DC 3-4-Wire

Inductive Sensors

DC 3-4-Wire
M8
S_n 4 mm, 6 mm

M8x1 non-flush* 4 mm 0...3.2 mm	M8x1 non-flush* 4 mm 0...3.2 mm	M8x1 non-flush* 4 mm 0...3.2 mm	M8x1 non-flush* 6 mm 0...4.8 mm	M8x1 non-flush* 6 mm 0...4.8 mm
BES M08EH-PSC40F-S04G BES M08EH-POC40F-S04G	BES M08EH-PSC40F-S49G BES M08EH-POC40F-S49G	BES M08EG1-PSC40F-S04G	BES M08MG1-PSC60F-S04G BES M08MG1-PSC60F-S49G	BES M08MG1-PSC60F-S49G BES M08MG1-POC60F-S49G
BES M08EH-NSC40F-S04G BES M08EH-NOC40F-S04G	BES M08EH-NSC40F-S49G BES M08EH-NOC40F-S49G		BES M08MG1-NSC60F-S04G BES M08MG1-NOC60F-S49G	BES M08MG1-NSC60F-S49G BES M08MG1-NOC60F-S49G
24 Vdc 10...30 Vdc ≤ 2.5 V 250 Vac 200 mA ≤ 10 mA/≤ 3 mA ≤ 10 µA yes yes ≤ 0.5 µF	24 Vdc 10...30 Vdc ≤ 2.5 V 250 Vac 200 mA ≤ 10 mA/≤ 3 mA ≤ 10 µA yes yes ≤ 0.5 µF	24 Vdc 10...30 Vdc ≤ 2.5 V 250 Vac 200 mA ≤ 12 mA/≤ 8 mA ≤ 10 µA yes yes ≤ 1.0 µF	24 Vdc 10...30 Vdc ≤ 2.0 V 75 Vdc 200 mA ≤ 12 mA/≤ 10 mA ≤ 100 µA yes yes ≤ 1.0 µF	24 Vdc 10...30 Vdc ≤ 2.0 V 75 Vdc 200 mA ≤ 12 mA/≤ 10 mA ≤ 100 µA yes yes ≤ 1.0 µF
≤ 5 % -25...+70 °C 1500 Hz yes IP 68 stainless steel PA 12 connector	≤ 5 % -25...+70 °C 1500 Hz yes IP 68 stainless steel PBT connector	≤ 5 % -25...+75 °C 5000 Hz yes IP 67 stainless steel PBTP connector	≤ 5 % -25...+70 °C 500 Hz yes IP 67 chrome plated brass PBTP connector	≤ 5 % -25...+70 °C 500 Hz yes IP 67 chrome plated brass PBTP connector
cULus C04 ANE-00-VY-050M	cULus C04 ANE-00-VY-050M	cULus C04 AEL-00-VY-050M	cULus C04 AEL-00-VY-050M	cULus C49 ANE-00-VY-050M

Inductive

1

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- Selection Charts
- Part Numbers
- Featured
- GlobalProx®
 - DC 3-Wire
 - DC 2-Wire
- SteelFace®
 - 2x
 - 3x
 - Fe/NFe
- Welding
 - Factor 1
 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories

- 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
- DC 2-Wire Block
- Specialty

- SuperShorties™
- Proxinox®
- High Temp
- Analog
- Large Housing
- Ring Sensor

- 6 Connectors

- 7 Accessories

- o Product Overview

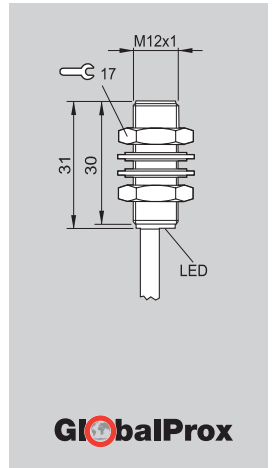
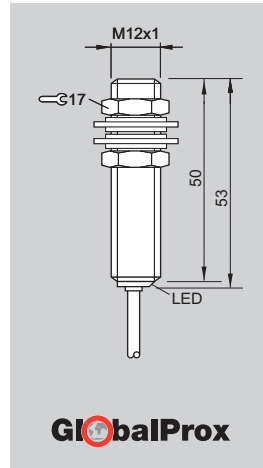
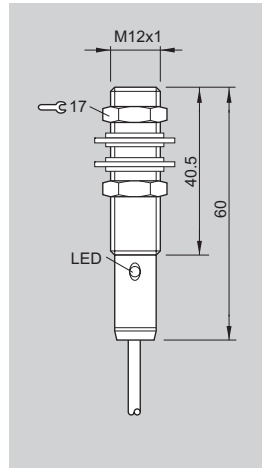
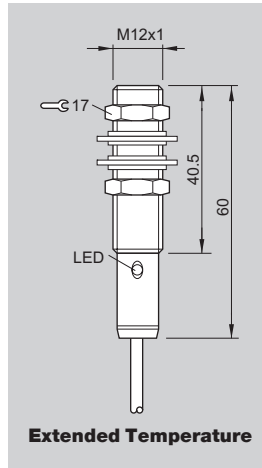
- t Technical Reference

- p Part Number Index



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

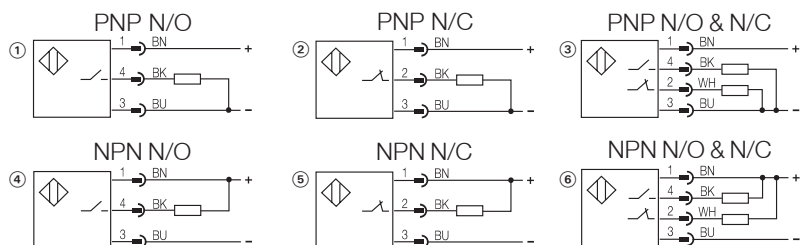
Housing Size	M12x1	M12x1	M12x1	M12x1
Mounting	flush	flush	flush	flush
Rated Operating Distance s _r	2 mm	2 mm	2 mm	2 mm
Assured Operating Distance s _a	0...1.6 mm	0...1.6 mm	0...1.6 mm	0...1.6 mm



PNP	Normally-open ①	BES 516-325-B0-C-05		BES M12MI-PSC20B-BV03	BES M12MD-PSC20B-BP02-003
	Normally-closed ②	BES 516-370-B0-C-05		BES M12MI-POC20B-BV03	BES M12MD-POC20B-BP02-003
	Complementary ③		BES 516-113-B0-C-05		
NPN	Normally-open ④	BES 516-329-B0-C-05		BES M12MI-NSC20B-BV03	BES M12MD-NSC20B-BP02-003
	Normally-closed ⑤	BES 516-375-B0-C-PU-05			BES M12MD-NOC20B-BP02-003
	Complementary ⑥		BES 516-118-B0-C-05		
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc	
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	12...30 Vdc	10...30 Vdc	
Voltage Drop U _d at I _e	≤ 1.5 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V	
Rated Insulation Voltage U _i	250 Vac	250 Vac	250 Vac	75 Vdc	
Load Current Capacity	200 mA	200 mA	200 mA	130 mA	
Current Consumption (closed/open)	≤ 8 mA/≤ 1 mA	≤ 32 mA/≤ 20 mA	≤ 15 mA/≤ 8 mA	≤ 25 mA/≤ 12 mA	
Off-state Current I _r	≤ 10 μA	≤ 80 μA	≤ 20 μA	≤ 80 μA	
Protected Against Polarity Reversal	yes	yes	yes	yes	
Short Circuit Protected	yes	yes	yes	yes	
Load Capacitance	≤ 0.5 μF	≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF	
Repeat Accuracy R	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %	
Ambient Temperature range T _a	-40...+85 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	
Operating Frequency f	3000 Hz	800 Hz	1200 Hz	1000 Hz	
Function Indication	yes	yes	yes	yes	
Degree of Protection per IEC 60529	IP 68	IP 68	IP 68	IP 68	
Housing Material	stainless steel	stainless steel	nickel plated brass	nickel plated brass	
Material of Sensing Face	PA 12	PA 12	PA 12	PA 12	
Connection	cable	cable	cable	cable	
No. of Wires x Gauge	3 x 22 AWG	4 x 24 AWG	3 x 22 AWG	3 x 22 AWG	
Approvals	cULus	cULus	cULus	cULus	
Recommended Connector					

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

Wiring Diagrams



Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

DC 3-4-Wire

Inductive Sensors

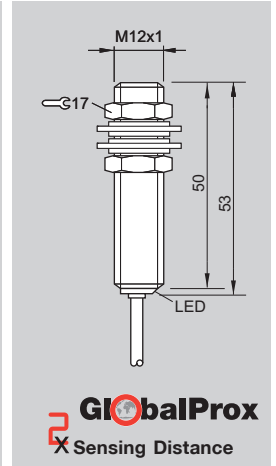
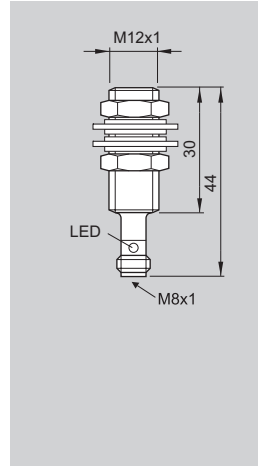
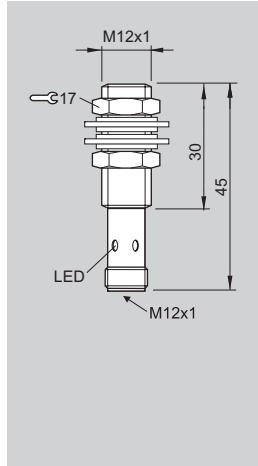
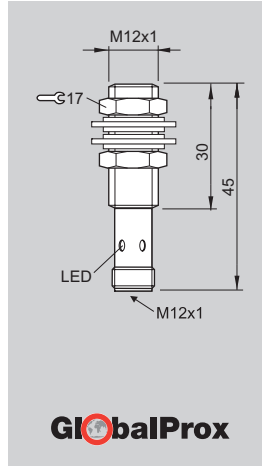
DC 3-/4-Wire
M12
S_n 2 mm

M12x1 flush 2 mm 0...1.6 mm	M12x1 flush 2 mm 0...1.6 mm	M12x1 flush 2 mm 0...1.6 mm	M12x1 flush 2 mm 0...1.6 mm
BES 516-325-E4-C-05 BES 516-370-E4-C-03	BES 516-325-E4-C-S4-00,5	BES 516-325-S4-C BES 516-370-S4-C BES 516-113-S4-C	BES M12MI-PSC20B-S04G BES M12MI-POC20B-S04G
BES 516-329-E4-C-05 BES 516-375-E4-C-03		BES 516-329-S4-C BES 516-375-S4-C BES 516-118-S4-C	BES M12MI-NSC20B-S04G BES M12MI-NOC20B-S04G
24 Vdc 10...30Vdc ≤ 2.5 V 75 Vdc 130 mA ≤ 25 mA/≤ 12 mA ≤ 80 μA yes yes ≤ 1.0 μF	24 Vdc 10...30Vdc ≤ 2.5 V 75 Vdc 130 mA ≤ 25 mA/≤ 12 mA ≤ 80 μA yes yes ≤ 1.0 μF	24 Vdc 10...30Vdc ≤ 1.5 V 250 Vac 200 mA ≤ 8 mA/≤ 1 mA ≤ 10 μA yes yes ≤ 0.5 μF	24 Vdc 12...30Vdc ≤ 2.5 V 250 Vac 200 mA ≤ 15 mA/≤ 8 mA ≤ 20 μA yes yes ≤ 1.0 μF
≤ 5 % -25...+70 °C 1000 Hz yes IP 68 nickel plated brass PA 12 cable 3 × 22 AWG cULus	≤ 5 % -25...+70 °C 1000 Hz yes IP 68 nickel plated brass PA 12 cable with connector cULus C04 AEL-00-VY-050M	≤ 5 % -40...+85 °C 3000 Hz yes IP 68 stainless steel PA 12 connector cULus C04 AEL-00-VY-050M	≤ 5 % -25...+70 °C 1200 Hz yes IP 68 nickel plated brass PA 12 connector cULus C04 AEL-00-VY-050M

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



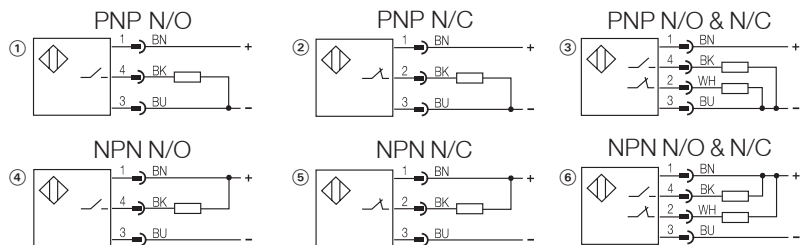
Housing Size	M12x1	M12x1	M12x1	M12x1
Mounting	flush	flush	flush	flush*
Rated Operating Distance s _n	2 mm	2 mm	2 mm	4 mm
Assured Operating Distance s _a	0...1.6 mm	0...1.6 mm	0...1.6 mm	0...3.2 mm



PNP	Normally-open ①	BESM12ME-PSC20B-S04G-003	BES 516-325-E5-C-S4	BES 516-325-E5-Y-S49	BES M12MI-PSC40B-BV03
	Normally-closed ②	BESM12ME-POC20B-S04G-003	BES 516-370-E5-C-S4		BES M12MI-POC40B-BV03
	Complementary ③				
NPN	Normally-open ④	BESM12ME-NSC20B-S04G-003	BES 516-329-E5-C-S4		BES M12MI-NSC40B-BV03
	Normally-closed ⑤	BESM12ME-NOC20B-S04G-003	BES 516-375-E5-C-S4		
	Complementary ⑥				
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc	
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	10...30 Vdc	12...30 Vdc	
Voltage Drop U _d at I _e	≤ 2.0 V	≤ 2.0 V	≤ 3.5 V	≤ 2.5 V	
Rated Insulation Voltage U _i	250 Vac	250 Vac	75 Vdc	250 Vac	
Load Current Capacity	200 mA	200 mA	130 mA	200 mA	
Current Consumption (closed/open)	≤ 10 mA/≤ 4 mA	≤ 10 mA/≤ 4 mA	≤ 25 mA/≤ 12 mA	≤ 15 mA/≤ 8 mA	
Off-state Current I _r	≤ 30 μA	≤ 30 μA	≤ 80 μA	≤ 20 μA	
Protected Against Polarity Reversal	yes	yes	yes	yes	
Short Circuit Protected	yes	yes	yes	yes	
Load Capacitance	≤ 0.5 μF	≤ 0.5 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	12000 Hz	5000 Hz	1000 Hz	300 Hz	
Function Indication	yes	yes	yes	yes	
Degree of Protection per IEC 60529	IP 68	IP 68	IP 67	IP 68	
Housing Material	nickel plated brass	nickel plated brass	nickel plated brass	nickel plated brass	
Material of Sensing Face	PBTP	PBTP	PA 12	LCP	
Connection	connector	connector	connector	cable	
No. of Wires x Gauge				3 X 22 AWG	
Approvals	cULus	cULus	cULus	cULus	
Recommended Connector	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C49 ANE-00-VY-050M		

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

Wiring Diagrams



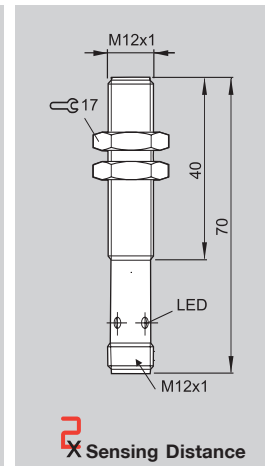
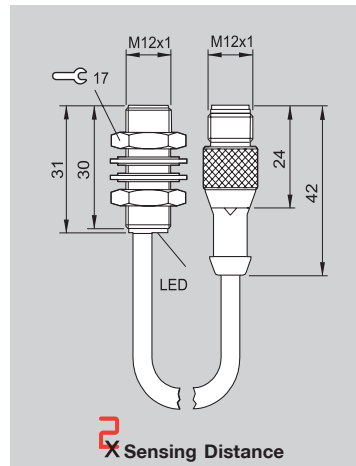
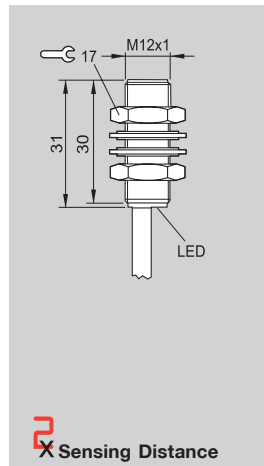
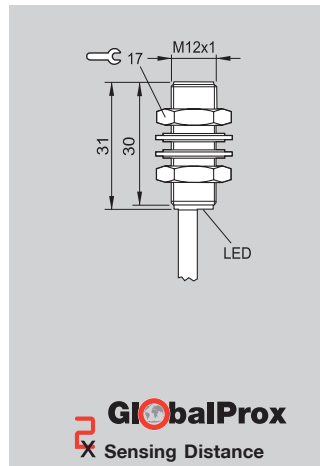
Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

DC 3-/4-Wire

Inductive Sensors

DC 3-/4-Wire
M12
S_n 4 mm

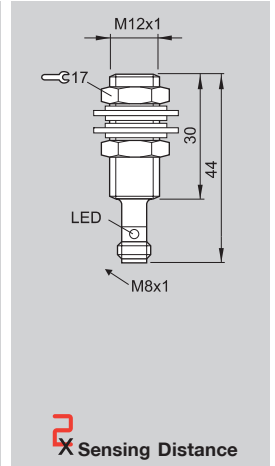
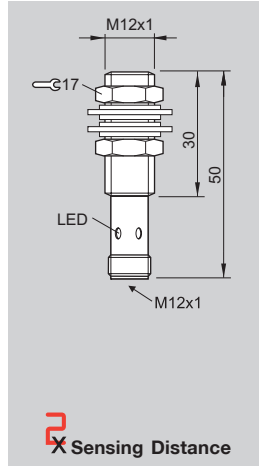
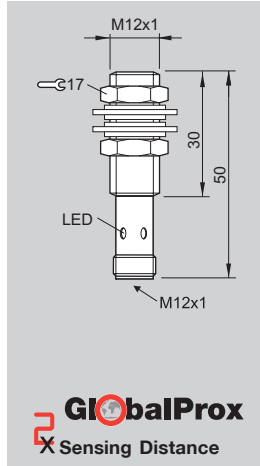
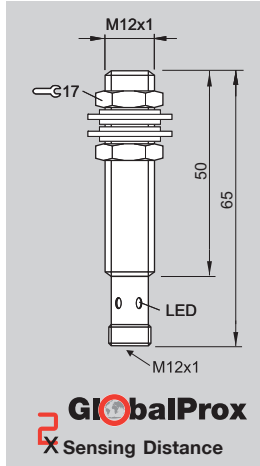
M12x1 flush* 4 mm 0...3.2 mm	M12x1 flush* 4 mm 0...3.2 mm	M12x1 flush* 4 mm 0...3.2 mm	M12x1 flush* 4 mm 0...3.2 mm
---------------------------------------	---------------------------------------	---------------------------------------	---------------------------------------



BES M12MD-PSC40B-BP02-003 BES M12MD-POC40B-BP02-003	BES 516-325-G-E4-Y-05 BES 516-370-G-E4-Y-03	BES 516-325-G-E4-Y-S4-00,5	BES 516-325-G-S4-C
BES M12MD-NSC40B-BP02-003 BES M12MD-NOC40B-BP02-003	BES 516-329-G-E4-Y-03 BES 516-375-G-E4-Y-PU-05		
24 Vdc	24 Vdc	24 Vdc	24 Vdc
10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
≤ 3.5 V	≤ 3.5 V	≤ 3.5 V	≤ 2.5 V
75 Vdc	75 Vdc	75 Vdc	250 Vac
130 mA	130 mA	130 mA	200 mA
≤ 25 mA/≤ 12 mA	≤ 25 mA/≤ 12 mA	≤ 25 mA/≤ 12 mA	≤ 12 mA/≤ 4 mA
≤ 80 μA	≤ 80 μA	≤ 80 μA	≤ 80 μA
yes	yes	yes	yes
yes	yes	yes	yes
≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF
≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
300 Hz	600 Hz	600 Hz	600 Hz
yes	yes	yes	yes
IP 68	IP 68	IP 68	IP 67
nickel plated brass	nickel plated brass	nickel plated brass	nickel plated brass
PA 12	PA 12	PA 12	LCP
cable	cable	cable with connector	connector
3 X 22 AWG	3 X 22 AWG		
cULus	cULus	cULus	cULus
		C04 AEL-00-VY-050M	C04 AEL-00-VY-050M

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

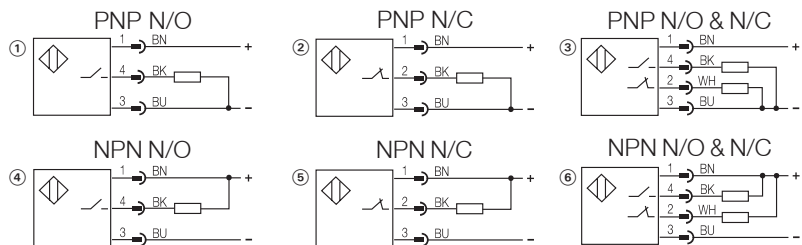
Housing Size	M12x1	M12x1	M12x1	M12x1
Mounting	flush*	flush*	flush*	flush*
Rated Operating Distance s _n	4 mm	4 mm	4 mm	4 mm
Assured Operating Distance s _a	0...3.2 mm	0...3.2 mm	0...3.2 mm	0...3.2 mm



PNP	Normally-open ①	BES M12MI-PSC40B-S04G	BES M12ME-PSC40B-S04G-003	BES 516-325-G-E5-Y-S4	BES 516-325-G-E5-Y-S49
	Normally-closed ②	BES M12MI-POC40B-S04G	BES M12ME-POC40B-S04G-003	BES 516-370-G-E5-Y-S4	BES 516-370-G-E5-Y-S49
	Complementary ③				
NPN	Normally-open ④	BES M12MI-NSC40B-S04G	BES M12ME-NSC40B-S04G-003	BES 516-329-G-E5-Y-S4	BES 516-329-G-E5-Y-S49
	Normally-closed ⑤	BES M12MI-NOC40B-S04G	BES M12ME-NOC40B-S04G-003		BES 516-375-G-E5-Y-S49
	Complementary ⑥				
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc	
Supply Voltage U _B	12...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc	
Voltage Drop U _d at I _e	≤ 2.5 V	≤ 3.5 V	≤ 3.5 V	≤ 3.5 V	
Rated Insulation Voltage U _i	250 Vac	75 Vdc	75 Vdc	75 Vdc	
Load Current Capacity	200 mA	130 mA	130 mA	130 mA	
Current Consumption (closed/open)	≤ 15 mA/≤ 8 mA	≤ 25 mA/≤ 12 mA	≤ 25 mA/≤ 12 mA	≤ 25 mA/≤ 12 mA	
Off-state Current I _r	≤ 20 μA	≤ 80 μA	≤ 80 μA	≤ 80 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	300 Hz	300 Hz	600 Hz	600 Hz	
Function Indication	yes	yes	yes	yes	
Degree of Protection per IEC 60529	IP 68	IP 67	IP 67	IP 67	
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	connector	connector	connector	connector	
No. of Wires x Gauge					
Approvals	cULus	cULus	cULus	cULus	
Recommended Connector	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C49 ANE-00-VY-050M	

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

Wiring Diagrams



Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

DC 3-/4-Wire

Inductive Sensors

DC 3-/4-Wire
M12
S_n 4 mm

M12x1 non-flush 4 mm 0...3.2 mm	M12x1 non-flush 4 mm 0...3.2 mm	M12x1 non-flush 4 mm 0...3.2 mm	M12x1 non-flush 4 mm 0...3.2 mm	M12x1 non-flush 4 mm 0...3.2 mm
Extended Temperature				
BES 516-356-B0-C-05 BES 516-3019-B0-C-05	BES 516-131-B0-C-05	BES 516-356-E4-C-05 BES 516-3019-E4-C-PU-05	BES 516-356-E4-C-54-00,3	BES 516-356-E4-C-S49-00,1
BES 516-357-B0-C-05 BES 516-3030-B0-C-03	BES 516-122-B0-C-05	BES 516-357-E4-C-05		
24 Vdc 10...30 Vdc ≤ 1.5 V 250 Vac 200 mA ≤ 8 mA/≤ 1 mA ≤ 10 μA yes yes ≤ 0.5 μF	24 Vdc 10...30 Vdc ≤ 2.5 V 250 Vac 200 mA ≤ 32 mA/≤ 20 mA ≤ 80 μA yes yes ≤ 1.0 μF	24 Vdc 10...30 Vdc ≤ 2.0 V 250 Vac 200 mA ≤ 10 mA/≤ 4 mA ≤ 30 μA yes yes ≤ 0.5 μF	24 Vdc 10...30 Vdc ≤ 2.0 V 250 Vac 200 mA ≤ 10 mA/≤ 4 mA ≤ 30 μA yes yes ≤ 0.5 μF	24 Vdc 10...30 Vdc ≤ 2.0 V 250 Vac 200 mA ≤ 10 mA/≤ 4 mA ≤ 30 μA yes yes ≤ 0.5 μF
≤ 5 % -40...+85 °C 1500 Hz yes IP 68 stainless steel PA 12 cable 3 × 22 AWG cULus	≤ 5 % -25...+70 °C 400 Hz yes IP 68 stainless steel PA 12 cable 4 × 24 AWG cULus	≤ 5 % -25...+70 °C 2000 Hz yes IP 68 nickel plated brass PBT cable 3 × 22 AWG cULus	≤ 5 % -25...+70 °C 2000 Hz yes IP 68 nickel plated brass PBT cable with connector cULus C04 AEL-00-VY-050M	≤ 5 % -25...+70 °C 2000 Hz yes IP 68 nickel plated brass PBT cable with connector cULus C49 ANE-00-VY-050M

Inductive

1

- Contents
- Selection Charts
- Part Numbers
- Featured
 - GlobalProx®
 - DC 3-Wire
 - DC 2-Wire
 - SteelFace®
 - 2x
 - 3x
 - Fe/NFe
 - Welding
 - Factor 1
 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories

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
- DC 2-Wire Block

Specialty

- SuperShorties™
- Proxinox®
- High Temp
- Analog
- Large Housing
- Ring Sensor

6

Connectors

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Accessories

o

Product Overview

t

Technical Reference

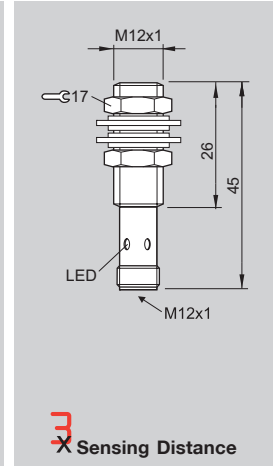
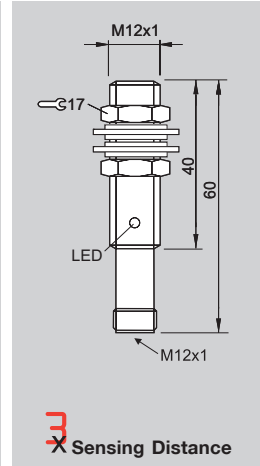
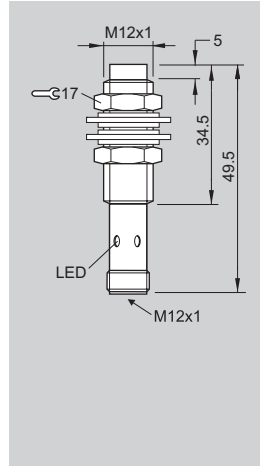
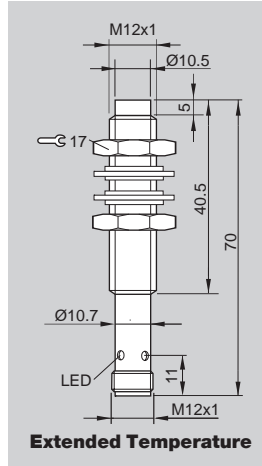
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Part Number Index



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

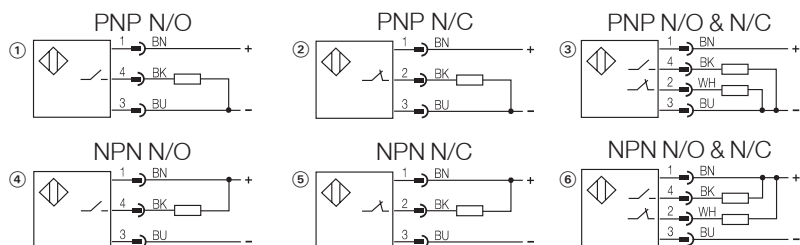
Housing Size	M12x1	M12x1	M12x1	M12x1
Mounting	non-flush	non-flush	quasi-flush*	quasi-flush*
Rated Operating Distance s _n	4 mm	4 mm	6 mm	6 mm
Assured Operating Distance s _a	0...3.2 mm	0...3.2 mm	0...4.8 mm	0...4.8 mm



PNP	Normally-open ①	BES 516-356-S4-C	BES 516-356-E5-C-S4	BES M12MG1-PSC60B-S04G	BES M12MD1-PSC60B-S04G
	Normally-closed ②	BES 516-3019-S4-C	BES 516-3019-E5-C-S4	BES M12MG1-POC60B-S04G	
	Complementary ③	BES 516-131-S4-C			
NPN	Normally-open ④	BES 516-357-S4-C	BES 516-357-E5-Y-S4	BES M12MG1-NSC60B-S04G	BES M12MD1-NSC60B-S04G
	Normally-closed ⑤	BES 516-3030-S4-C		BES M12MG1-NOC60B-S04G	
	Complementary ⑥	BES 516-122-S4-C			
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...30 Vdc	10...30 Vdc
Voltage Drop U _d at I _e	≤ 1.5 V	≤ 2.0 V	≤ 2.0 V	≤ 2.0 V	≤ 2.0 V
Rated Insulation Voltage U _i	250 Vac	250 Vac	75 Vdc	75 Vdc	75 Vdc
Load Current Capacity	200 mA	200 mA	200 mA	200 mA	200 mA
Current Consumption (closed/open)	≤ 8 mA/≤ 8 mA	≤ 10 mA/≤ 4 mA	≤ 10 mA/≤ 10 mA	≤ 10 mA/≤ 10 mA	≤ 10 mA/≤ 10 mA
Off-state Current I _r	≤ 50 µA	≤ 30 µA	≤ 100 µA	≤ 100 µA	≤ 100 µA
Protected Against Polarity Reversal	yes	yes	yes	yes	yes
Short Circuit Protected	yes	yes	yes	yes	yes
Load Capacitance	≤ 1.0 µF	≤ 0.5 µF	≤ 1.0 µF	≤ 1.0 µF	≤ 1.0 µF
Repeat Accuracy R	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
Ambient Temperature range T _a	-40...+85 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
Operating Frequency f	1500 Hz	2000 Hz	800 Hz	800 Hz	800 Hz
Function Indication	yes	yes	yes	yes	yes
Degree of Protection per IEC 60529	IP 68	IP 68	IP 67	IP 67	IP 67
Housing Material	stainless steel	nickel plated brass	chrome plated brass	chrome plated brass	chrome plated brass
Material of Sensing Face	PA 12	PBT	PBTP	PBTP	PBTP
Connection	connector	connector	connector	connector	connector
No. of Wires x Gauge					
Approvals	cULus	cULus			
Recommended Connector	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M

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

Wiring Diagrams



Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

DC 3-/4-Wire

Inductive Sensors

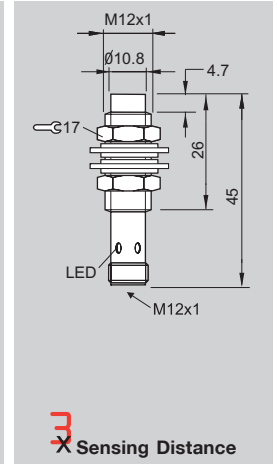
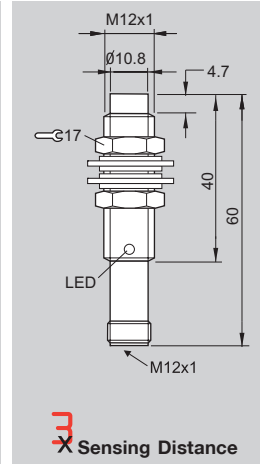
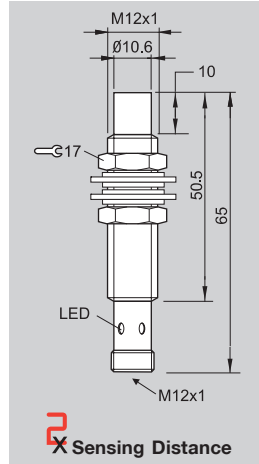
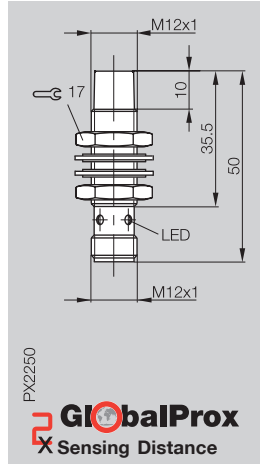
DC 3-/4-Wire
M12
S_n 7 mm, 8 mm

M12x1 non-flush* 7 mm 0...5.7 mm	M12x1 non-flush* 7 mm 0...5.7 mm	M12x1 quasi-flush* 8 mm 0...5.8 mm	M12x1 non-flush* 8 mm 0...6.5 mm	M12x1 non-flush* 8 mm 0...6.5 mm
BES M12EG-PSC70F-S04G	BES M12MF1-PSC70F-S04G	BES M12MI-PSH80B-S04G	BES M12MG-PSC80F-BV02 BES M12MG-POC80F-BV02	BES M12MG-PSC80F-S04G BES M12MG-POC80F-S04G
	BES M12MF1-NSC70F-S04G	BES M12MI-NSH80B-S04G	BES M12MG-NSC80F-BV02 BES M12MG-NOC80F-BV02	BES M12MG-NSC80F-S04G BES M12MG-NOC80F-S04G
24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc
10...30 Vdc	10...30 Vdc	10...55 Vdc	10...30 Vdc	10...30 Vdc
≤ 2.0 V	≤ 2.0 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
250 Vac	75 Vdc	250 Vac	75 Vdc	75 Vdc
200 mA	200 mA	200 mA	200 mA	200 mA
≤ 8 mA	≤ 10 mA	≤ 10 mA/ ≤ 8 mA	≤ 10 mA/ ≤ 3 mA	≤ 10 mA/ ≤ 3 mA
≤ 100 μA	≤ 100 μA	≤ 10 μA	≤ 10 μA	≤ 10 μA
yes	yes	yes	yes	yes
yes	yes	yes	yes	yes
≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF	≤ 0.5 μF	≤ 0.5 μF
≤ 5 %	≤ 5 %	≤ 10 %	≤ 5 %	≤ 5 %
-25...+70 °C	-25...+70 °C	0...+60 °C	-25...+70 °C	-25...+70 °C
3000 Hz	400 Hz	300 Hz	800 Hz	800 Hz
yes	yes	yes	yes	yes
IP 68	IP 67	IP 67	IP 67	IP 67
stainless steel	nickel plated brass	nickel plated brass	CuZn, Ni free	CuZn, Ni free
PBT	PBT	LCP	PBT	PBT
connector	connector	connector	cable	connector
			3 x 22 AWG	
			cULus	cULus
C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M		C04 AEL-00-VY-050M



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

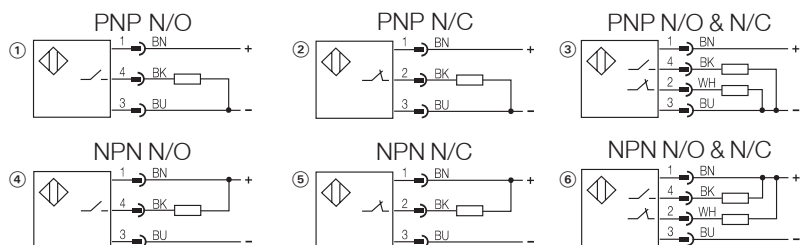
Housing Size	M12x1	M12x1	M12x1	M12x1
Mounting	non-flush*	non-flush*	non-flush*	non-flush*
Rated Operating Distance s _n	8 mm	8 mm	10 mm	10 mm
Assured Operating Distance s _a	0...6.5 mm	0...6.5 mm	0...8 mm	0...8 mm



PNP	Normally-open ①	BESM12MC1-PSC80F-S04G	BESM12EG-PSC80F-S04G	BESM12MF1-PSC10F-S04G	BESM12MC1-PSC10F-S04G
	Normally-closed ②	BESM12MC1-POC80F-S04G		BESM12MF1-POC10F-S04G	
	Complementary ③				
NPN	Normally-open ④	BESM12MC1-NSC80F-S04G		BESM12MF1-NSC10F-S04G	BESM12MC1-NSC10F-S04G
	Normally-closed ⑤	BESM12MC1-NOC80F-S04G			
	Complementary ⑥				
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc	
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc	
Voltage Drop U _d at I _e	≤ 2.5 V	≤ 2.5 V	≤ 2.0 V	≤ 2.0 V	
Rated Insulation Voltage U _i	250 Vac	250 Vac	75 Vdc	75 Vdc	
Load Current Capacity	200 mA	200 mA	200 mA	200 mA	
Current Consumption (closed/open)	≤ 3 mA/10 mA	≤ 12 mA/10 mA	≤ 10 mA/10 mA	≤ 10 mA/10 mA	
Off-state Current I _r	≤ 10 µA	≤ 80 µA	≤ 100 µA	≤ 100 µA	
Protected Against Polarity Reversal	yes	yes	yes	yes	
Short Circuit Protected	yes	yes	yes	yes	
Load Capacitance	≤ 0.5 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	800 Hz	1500 Hz	400 Hz	400 Hz	
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 67	IP 67	
Housing Material	CuNi, Ni free coated	stainless steel	chrome plated brass	chrome plated brass	
Material of Sensing Face	PBT	PBTP	PBTP	PBTP	
Connection	connector	connector	connector	connector	
No. of Wires x Gauge					
Approvals	cULus	cULus			
Recommended Connector	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	

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

Wiring Diagrams



Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

DC 3-/4-Wire

Inductive Sensors

DC 3-/4-Wire
M18
S_n 5 mm

M18x1 flush 5 mm 0...4 mm	M18x1 flush 5 mm 0...4.1 mm	M18x1 flush 5 mm 0...4 mm	M18x1 flush 5 mm 0...4 mm	M18x1 flush 5 mm 0...4 mm
BES 516-326-B0-C-05	BES M18MI-PSC50B-BV03	BES M18MD-PSC50B-BP02-003	BES 516-326-E4-C-05	BES 516-326-S4-C
BES 516-105-B0-C-05	BES M18MI-POC50B-BV03	BES M18MD-POC50B-BP02-003		BES 516-367-S4-C
BES 516-355-B0-C-05	BES M18MI-NSC50B-BV03	BES M18MD-NSC50B-BP02-003		BES 516-105-S4-C
BES 516-366-B0-C-05				BES 516-355-S4-C
BES 516-111-B0-C-05				BES 516-366-S4-C
				BES 516-111-S4-C
24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc
10...30 Vdc	12...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
≤ 1.5 V/≤ 2.5 V [†]	≤ 2.5 V	≤ 2.0 V	≤ 2.0 V	≤ 1.5 V/≤ 2.5 V [†]
250 Vac	250 Vac	75 Vdc	75 Vdc	250 Vac
200 mA	200 mA	200 mA	200 mA	200 mA
≤ 8 mA/≤ 1 mA	≤ 15 mA/≤ 8 mA	≤ 10 mA/≤ 3 mA	≤ 10 mA/≤ 3 mA	≤ 8 mA/≤ 1 mA
≤ 10 μA/80 μA [†]	≤ 20 μA	≤ 80 μA	≤ 80 μA	≤ 10 μA/80 μA [†]
yes	yes	yes	yes	yes
yes	yes	yes	yes	yes
≤ 0.8 μF/1.0 μF [†]	≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF	≤ 0.8 μF/1.0 μF [†]
≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
900 Hz/500 Hz [†]	700 Hz	375 Hz/700Hz [†]	1000 Hz	900 Hz/500 Hz [†]
yes	yes	yes	yes	yes
IP 68/IP 67 [†]	IP 68	IP 67	IP 67	IP 68/IP 67 [†]
nickel plated brass	nickel plated brass	nickel plated brass	nickel plated brass	nickel plated brass
PA 12	PA 12	PBTP	PBTP	PA 12
cable	cable	cable	cable	connector
(4) [†] 3 x 22 AWG	3 x 22 AWG	3 x 22 AWG	3 x 22 AWG	
cULus	cULus	cULus	cULus	cULus
				C04 AEL-00-VY-050M

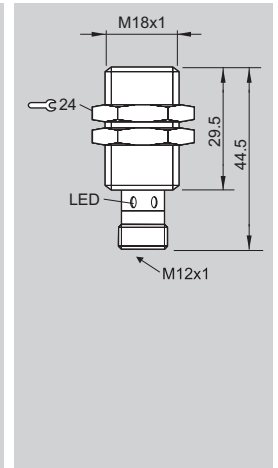
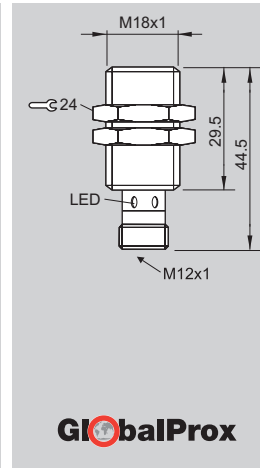
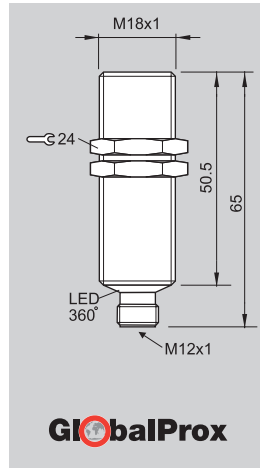
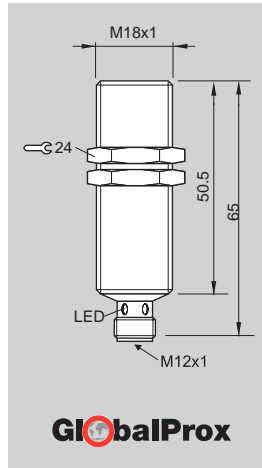
[†] complementary

[‡] PNP Normally-open



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

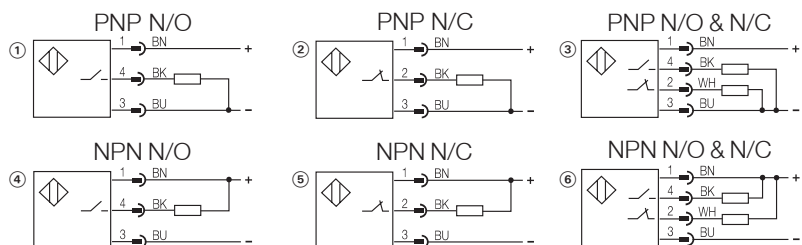
Housing Size	M18x1	M18x1	M18x1	M18x1
Mounting	flush	flush	flush	flush
Rated Operating Distance s _n	5 mm	5 mm	5 mm	5 mm
Assured Operating Distance s _a	0...4.1 mm	0...4.1 mm	0...4 mm	0...4 mm



PNP	Normally-open ①	BES M18MI-PSC50B-S04G	BES M18MI-PSC50B-S04K	BES M18ME-PSC50B-S04G-003	BES 516-326-E5-C-S4
	Normally-closed ②		BES M18MI-POC50B-S04K	BES M18ME-POC50B-S04G-003	BES 516-367-E5-Y-S4
	Complementary ③				
NPN	Normally-open ④		BES M18MI-NSC50B-S04K	BES M18ME-NSC50B-S04G-003	BES 516-355-E5-Y-S4
	Normally-closed ⑤		BES M18MI-NOC50B-S04K		
	Complementary ⑥				
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc	
Supply Voltage U _B	12...30 Vdc	12...30 Vdc	10...30 Vdc	10...30 Vdc	
Voltage Drop U _d at I _e	≤ 2.5 V	≤ 2.5 V	≤ 3.5 V	≤ 3.5 V	
Rated Insulation Voltage U _i	250 Vac	250 Vac	75 Vdc	75 Vdc	
Load Current Capacity	200 mA	200 mA	130 mA	130 mA	
Current Consumption (closed/open)	≤ 15 mA/≤ 8 mA	≤ 15 mA/≤ 8 mA	≤ 25 mA/≤ 12 mA	≤ 25 mA/≤ 12 mA	
Off-state Current I _r	≤ 20 μA	≤ 20 μA	≤ 80 μA	≤ 80 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	700 Hz	700 Hz	700 Hz	500 Hz	
Function Indication	yes	yes	yes	yes	
Degree of Protection per IEC 60529	IP 68	IP 68	IP 67	IP 67	
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	connector	connector	connector	connector	
No. of Wires x Gauge					
Approvals	cULus	cULus	cULus	cULus	
Recommended Connector	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	

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

Wiring Diagrams



Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

DC 3-/4-Wire

Inductive Sensors

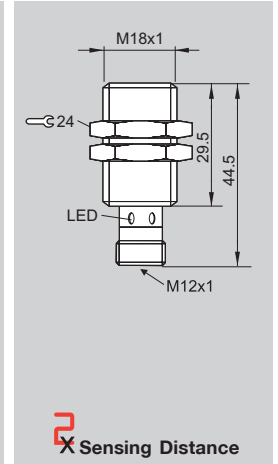
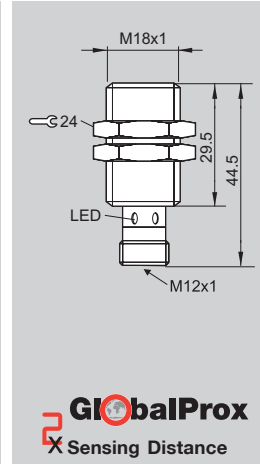
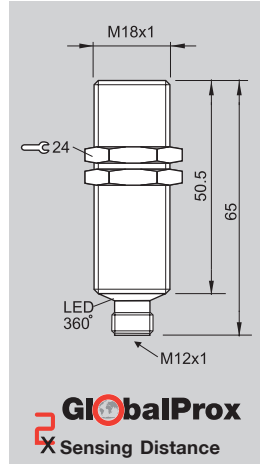
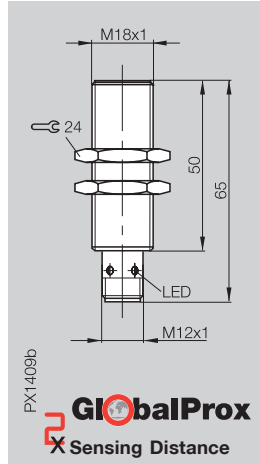
DC 3-/4-Wire
M18
S_n 8 mm

M18x1 flush* 8 mm 0...6.5 mm	M18x1 flush* 8 mm 0...6.5 mm	M18x1 flush* 8 mm 0...6.5 mm	M18x1 flush* 8 mm 0...6.5 mm	M18x1 flush* 8 mm 0...6.5 mm
GlobalProx X Sensing Distance	GlobalProx X Sensing Distance	X Sensing Distance	X Sensing Distance	X Sensing Distance
BES M18MI-PSC80B-BV03	BES M18MD-PSC80B-BP02-003 BES M18MD-POC80B-BP02-003	BES 516-326-G-E4-Y-05 BES 516-367-G-E4-Y-03	BES 516-326-G-S4-C	BES 516-326-G-S4-H BES 516-105-G-S4-H
BES M18MI-NSC80B-BV03	BES M18MD-NSC80B-BP02-003 BES M18MD-NOC80B-BP02-003	BES 516-355-G-E4-Y-03 BES 516-366-G-E4-Y-03		
24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc
12...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc	10...55 Vdc
≤ 2.5 V	≤ 3.5 V	≤ 3.5 V	≤ 3.5 V	≤ 2.5 V
250 Vac	75 Vdc	75 Vdc	75 Vdc	75 Vdc
200 mA	130 mA	130 mA	130 mA	200 mA
≤ 15 mA/≤ 8 mA	≤ 25 mA/≤ 12 mA	≤ 25 mA/≤ 12 mA	≤ 25 mA/≤ 12 mA	≤ 15 mA/≤ 10 mA
≤ 20 µA	≤ 80 µA	≤ 80 µA	≤ 80 µA	≤ 80 µA
yes	yes	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
150 Hz	150 Hz	200 Hz	500 Hz	80 Hz
yes	yes	yes	yes	yes
IP 68	IP 68	IP 68	IP 67	IP 67
nickel plated brass	nickel plated brass	nickel plated brass	nickel plated brass	nickel plated brass
PA 12	PBTP	PBTP	PA 12	PBTP
cable	cable	cable	connector	connector
3 x 22 AWG	3 x 22 AWG	3 x 22 AWG		
cULus	cULus	cULus	cULus	cULus
			C04 AEL-00-VY-050M	C04 AEL-00-VY-050M



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

Housing Size	M18x1	M18x1	M18x1	M18x1
Mounting	flush*	flush*	flush*	flush*
Rated Operating Distance s _n	8 mm	8 mm	8 mm	8 mm
Assured Operating Distance s _a	0...6.5 mm	0...6.5 mm	0...6.5 mm	0...6.5 mm



PNP	Normally-open ①	BES M18MI-PSC80B-S04G	BES M18MI-PSC80B-S04K	BESM18ME-PSC80B-S04G-003	BES 516-326-G-E5-Y-S4
	Normally-closed ②		BES M18MI-POC80B-S04K	BESM18ME-POC80B-S04G-003	BES 516-367-G-E5-Y-S4
	Complementary ③				

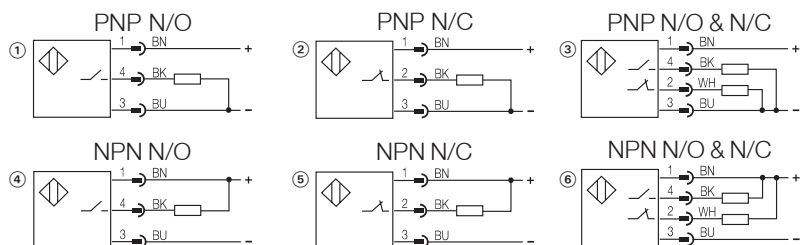
NPN	Normally-open ④	BES M18MI-NOC80B-S04G	BES M18MI-NSC80B-S04K	BESM18ME-NSC80B-S04G-003	BES 516-355-G-E5-Y-S4
	Normally-closed ⑤				
	Complementary ⑥				

Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	12...30 Vdc	12...30 Vdc	10...30 Vdc	10...30 Vdc
Voltage Drop U _d at I _e	≤ 2.5 V	≤ 2.5 V	≤ 3.5 V	≤ 3.5 V
Rated Insulation Voltage U _i	250 Vac	250 Vac	75 Vdc	75 Vdc
Load Current Capacity	200 mA	200 mA	130 mA	130 mA
Current Consumption (closed/open)	≤ 15 mA/≤ 8 mA	≤ 15 mA/≤ 8 mA	≤ 25 mA/≤ 12 mA	≤ 25 mA/≤ 12 mA
Off-state Current I _r	≤ 20 μA	≤ 20 μA	≤ 80 μA	≤ 80 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	150 Hz	150 Hz	200 Hz	200 Hz
Function Indication	yes	yes	yes	yes
Degree of Protection per IEC 60529	IP 68	IP 68	IP 67	IP 67
Housing Material	nickel plated brass	nickel plated brass	nickel plated brass	nickel plated brass
Material of Sensing Face	PA 12	PA 12	PBTP	PBTP
Connection	connector	connector	connector	connector
No. of Wires x Gauge				
Approvals	cULus	cULus	cULus	cULus
Recommended Connector	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M

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

Wiring Diagrams



Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

DC 3-/4-Wire

Inductive Sensors

DC 3-/4-Wire
M18
S_n 8 mm, 12 mm

M18x1 non-flush 8 mm 0...6.5 mm	M18x1 non-flush 8 mm 0...6.5 mm	M18x1 non-flush 8 mm 0...6.5 mm	M18x1 non-flush 8 mm 0...6.5 mm	M18x1 quasi-flush* 12 mm 0...9.6 mm
BES 516-360-B0-C-05 BES 516-3026-B0-C-05 BES 516-123-B0-C-05	BES 516-360-E4-Y-05 BES 516-3026-E4-Y-05	BES 516-360-S4-C BES 516-3026-S4-C BES 516-123-S4-C	BES 516-360-E5-Y-S4 BES 516-3026-E5-Y-S4	BESM18MG1-PSC12B-S04G
BES 516-361-B0-C-05 BES 516-3031-B0-C-03 BES 516-124-B0-C-05	BES 516-361-E4-Y-05	BES 516-361-S4-C BES 516-124-S4-C	BES 516-361-E5-Y-S4	BESM18MG1-NSC12B-S04G
24 Vdc 10...30 Vdc ≤ 1.5 V/≤ 2.5V [†] 250 Vac 200 mA ≤ 8 mA/≤ 1 mA ≤ 10 μA/≤ 80 μA [†] yes yes ≤ 0.8 μF/≤ 1.0 μF [†]	24 Vdc 10...30 Vdc ≤ 3.5V 250 Vac 130 mA ≤ 25 mA/≤ 12 mA ≤ 80 μA yes yes ≤ 1.0 μF	24 Vdc 10...30 Vdc ≤ 1.5 V/≤ 2.5V [†] 250 Vac 200 mA ≤ 8 mA/≤ 1 mA ≤ 10 μA/≤ 80 μA [†] yes yes ≤ 0.8 μF/≤ 1.0 μF [†]	24 Vdc 10...30 Vdc ≤ 3.5 V 75 Vdc 130 mA ≤ 25 mA/≤ 12 mA ≤ 80 μA yes yes ≤ 1.0 μF	24 Vdc 10...30 Vdc ≤ 2.0 V 75 Vdc 200 mA ≤ 10 mA/≤ 10 mA ≤ 100 μA yes yes ≤ 1.0 μF
≤ 5 % -25...+70 °C 600 Hz/200 Hz [†] yes IP 68/IP 67 [†] nickel plated brass PA 12 cable (4) [†] 3 × 22 AWG cULus	≤ 5 % -25...+70 °C 200 Hz yes IP 68 nickel plated brass PA 12 cable 3 × 22 AWG cULus	≤ 5 % -25...+70 °C 600 Hz/200 Hz [†] yes IP 68/IP 67 nickel plated brass PA 12 connector cULus C04 AEL-00-VY-050M	≤ 5 % -25...+70 °C 200 Hz yes IP 67 nickel plated brass PA 12 connector cULus C04 AEL-00-VY-050M	≤ 5 % -25...+70 °C 500 Hz yes IP 67 chrome plated brass PBTP connector C04 AEL-00-VY-050M

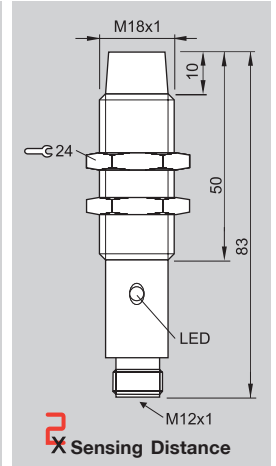
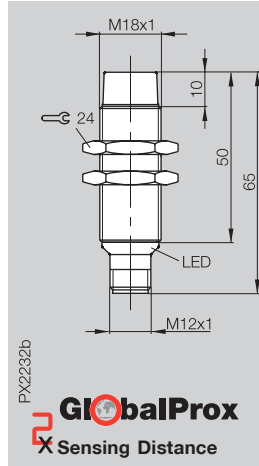
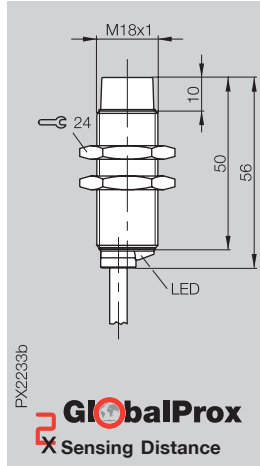
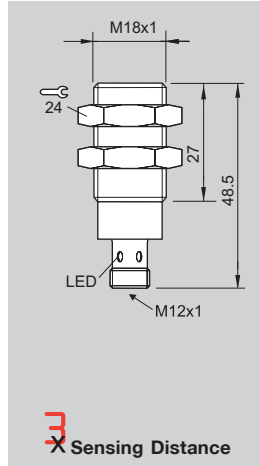
[†] complementary

[†] complementary



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

Housing Size	M18x1	M18x1	M18x1	M18x1
Mounting	quasi-flush*	non-flush*	non-flush*	non-flush*
Rated Operating Distance s _n	12 mm	16 mm	16 mm	16 mm
Assured Operating Distance s _a	0...9.6 mm	0...12.8 mm	0...12.8 mm	0...13 mm



PNP	Normally-open ①	BESM18MD1-PSC12B-S04G	BES M18MG-PSC16F-BV02	BES M18MG-PSC16F-S04K	BES 516-360-G-S4-H
	Normally-closed ②		BES M18MG-POC16F-BV02	BES M18MG-POC16F-S04K	
	Complementary ③				BES 516-123-G-S4-H

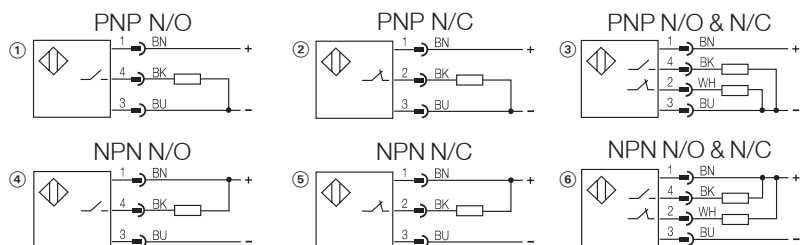
NPN	Normally-open ④	BESM18MD1-NSC12B-S04G	BES M18MG-NSC16F-BV02	BES M18MG-NSC16F-S04K	
	Normally-closed ⑤		BES M18MG-NOC16F-BV02	BES M18MG-NOC16F-S04K	
	Complementary ⑥				

Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	10...30 Vdc	10...55 Vdc
Voltage Drop U _d at I _e	≤ 2.0 V	≤ 2.0 V	≤ 2.0 V	≤ 2.5 V
Rated Insulation Voltage U _i	75 Vdc	75 Vdc	75 Vdc	250 Vac
Load Current Capacity	200 mA	200 mA	200 mA	200 mA
Current Consumption (closed/open)	≤ 10 mA/≤ 10 mA	≤ 10 mA/≤ 10 mA	≤ 10 mA/≤ 10 mA	≤ 15 mA/≤ 5 mA
Off-state Current I _r	≤ 100 μA	≤ 100 μA	≤ 100 μA	≤ 80 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	500 Hz	500 Hz	500 Hz	80 Hz
Function Indication	yes	yes	yes	yes
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67	IP 68
Housing Material	chrome plated brass	chrome plated brass	chrome plated brass	nickel plated brass
Material of Sensing Face	PBTP	PBTP	PBTP	PA 12
Connection	connector	connector	connector	connector
No. of Wires x Gauge				
Approvals		cULus	cULus	cULus
Recommended Connector	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M

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

Wiring Diagrams



Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

DC 3-4-Wire

Inductive Sensors

DC 3-4-Wire
M18, M30
S_n 10 mm, 20 mm

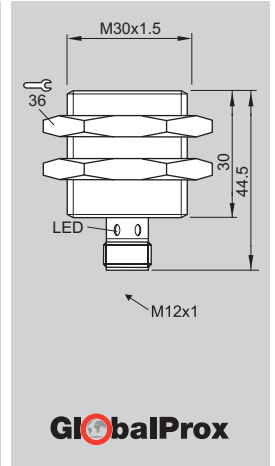
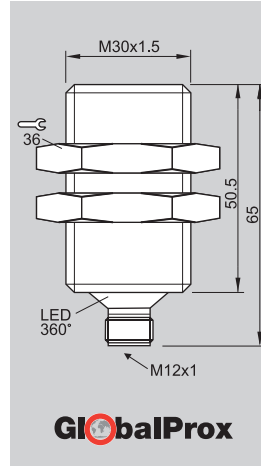
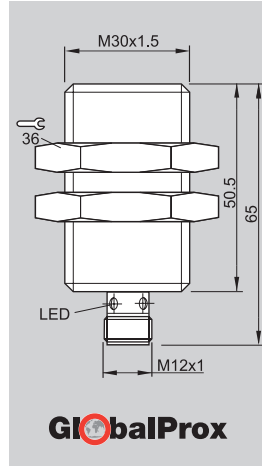
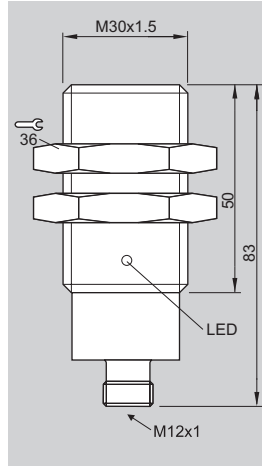
M18x1 non-flush* 20 mm 0...16.2 mm	M30x1.5 flush 10 mm 0...8.1 mm	M30x1.5 flush 10 mm 0...8.1 mm	M30x1.5 flush 10 mm 0...8.1 mm	M30x1.5 flush 10 mm 0...8.1 mm
BESM18ME1-PSC20F-S04G	BES 516-327-B0-C-05 BES 516-114-B0-C-05	BES M30MI-PSC10B-BV02 BES M30MI-POC10B-BV02	BESM30MD-PSC10B-BP02-003	BES 516-327-E4-Y-05
BESM18ME1-NSC20F-S04G	BES 516-359-B0-C-03 BES 516-120-B0-C-05	BES M30MI-NSC10B-BV02 BES M30MI-NOC10B-BV02	BESM30MD-NSC10B-BP02-003	BES 516-359-E4-Y-05
24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc
10...30 Vdc	10...30 Vdc	12...30 Vdc	10...30 Vdc	10...30 Vdc
≤ 2.0 V	≤ 2.5 V	≤ 2.5 V	≤ 3.5 V	≤ 3.5 V
75 Vdc	250 Vac	250 Vac	75 Vdc	75 Vdc
200 mA	200 mA	200 mA	130 mA	130 mA
≤ 10 mA/≤ 10 mA	≤ 25 mA/≤ 12 mA	≤ 10 mA/≤ 5 mA	≤ 25 mA/≤ 12 mA	≤ 25 mA/≤ 12 mA
≤ 100 µA	≤ 80 µA	≤ 20 µA	≤ 80 µA	≤ 80 µA
yes	yes	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
200 Hz	300 Hz	400 Hz	150 Hz	200 Hz
yes	yes	yes	yes	yes
IP 54	IP 67/IP 68†	IP 68	IP 68	IP 68
chrome plated brass	nickel plated brass	nickel plated brass	nickel plated brass	nickel plated brass
PBTP	PA 12	PA 12	PA 12	PA 12
connector	cable	cable	cable	cable
	(4)† 3 x 22 AWG	3 x 22 AWG	3 x 24 AWG	3 x 24 AWG
	cULus	cULus	cULus	cULus
CO4 AEL-00-VY-050M				

† complementary



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

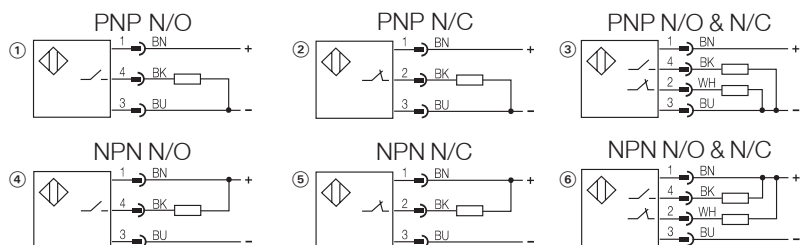
Housing Size	M30x1.5	M30x1.5	M30x1.5	M30x1.5
Mounting	flush	flush	flush	flush
Rated Operating Distance s _n	10 mm	10 mm	10 mm	10 mm
Assured Operating Distance s _a	0...8.1 mm	0...8.1 mm	0...8.1 mm	0...8.1 mm



PNP	Normally-open ①	BES 516-327-S4-C	BES M30MI-PSC10B-S04G	BES M30MI-PSC10B-S04K	BES M30ME-PSC10B-S04G-003
	Normally-closed ②	BES 516-3028-S4-C		BES M30MI-POC10B-S04K	BES M30ME-POC10B-S04G-003
	Complementary ③	BES 516-114-S4-C			
NPN	Normally-open ④	BES 516-359-S4-C		BES M30MI-NSC10B-S04K	BES M30ME-NSC10B-S04G-003
	Normally-closed ⑤			BES M30MI-NOC10B-S04K	
	Complementary ⑥	BES 516-120-S4-C			
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc	
Supply Voltage U _B	10...30 Vdc	12...30 Vdc	12...30 Vdc	10...30 Vdc	
Voltage Drop U _d at I _e	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V	≤ 3.5 V	
Rated Insulation Voltage U _i	250 Vac	75 Vdc	250 Vac	75 Vdc	
Load Current Capacity	200 mA	200 mA	200 mA	130 mA	
Current Consumption (closed/open)	≤ 25 mA/≤ 12 mA	≤ 10 mA	≤ 10 mA/≤ 5 mA	≤ 25 mA/≤ 12 mA	
Off-state Current I _r	≤ 80 μA	≤ 20 μA	≤ 20 μA	≤ 80 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	300 Hz	400 Hz	400 Hz	150 Hz	
Function Indication	yes	yes	yes	yes	
Degree of Protection per IEC 60529	IP 68	IP 67	IP 68	IP 67	
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	connector	connector	connector	connector	
No. of Wires x Gauge					
Approvals	cULus	cULus	cULus	cULus	
Recommended Connector	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	

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

Wiring Diagrams



Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

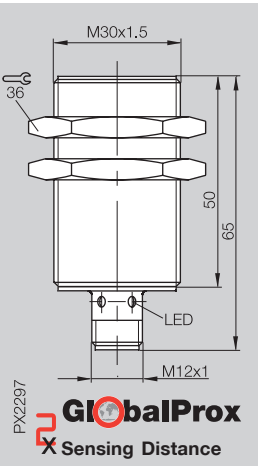
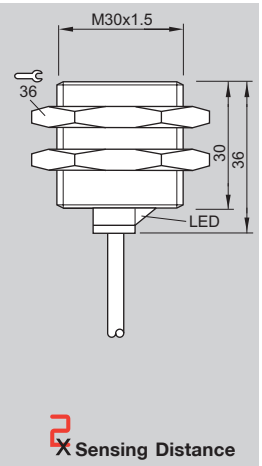
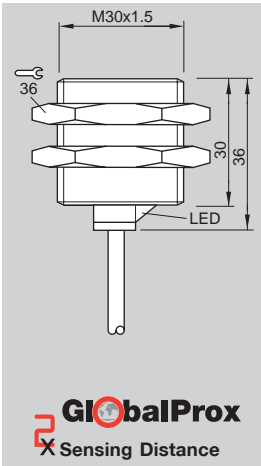
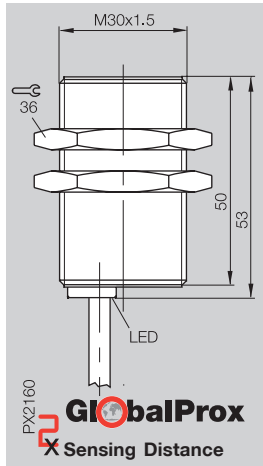
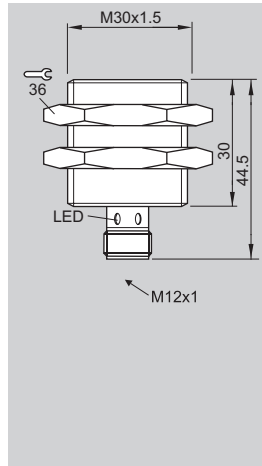
DC 3-4-Wire

Inductive Sensors

DC 3-4-Wire
M30
s_n 10 mm, 15 mm

M30x1.5

M30x1.5	M30x1.5	M30x1.5	M30x1.5	M30x1.5
flush	flush*	flush*	flush*	flush*
10 mm	15 mm	15 mm	15 mm	15 mm
0...8.1 mm	0...12.2 mm	0...12.0 mm	0...12.0 mm	0...12.2 mm



BES 516-327-E5-Y-S4	BES M30MI-PSC15B-BV02	BESM30MD-PSC15B-BP02-003	BES 516-327-G-E4-Y-	BESM30MI-PSC15B-S04G
BES 516-3028-E5-Y-S4	BES M30MI-PSC15B-BV02	BESM30MD-POC15B-BP02-003	BES 516-3028-G-E4-Y-	

BES 516-359-E5-Y-S4		BESM30MD-NSC15B-BP02-003	BES 516-359-G-E4-Y-	
			BES 516-3032-G-E4-Y-	

24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc
10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
≤ 3.5 V	≤ 2.5 V	≤ 3.5 V	≤ 3.5 V	≤ 2.5 V
75 Vdc	250 Vac	75 Vdc	75 Vdc	250 Vac
130 mA	200 mA	130 mA	130 mA	200 mA
≤ 25 mA/≤ 12 mA	≤ 10 mA/≤ 5 mA	≤ 25 mA/≤ 12 mA	≤ 25 mA/≤ 12 mA	≤ 10 mA/≤ 5 mA
≤ 80 μA	≤ 10 μA	≤ 80 μA	≤ 80 μA	≤ 10 μA
yes	yes	yes	yes	yes
yes	yes	yes	yes	yes
≤ 1.0 μF	≤ 0.5 μF	≤ 1.0 μF	≤ 1.0 μF	≤ 0.5 μF
≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
500 Hz	100 Hz	75 Hz	100 Hz	100 Hz
yes	yes	yes	yes	yes
IP 67	IP 67	IP 68	IP 68	IP 68
nickel plated brass	brass, Ni free coated	nickel plated brass	nickel plated brass	brass, Ni free coated
PA 12	PA 12	PA 12	PA 12	PA 12
connector	cable	cable	cable	
	3 x 22 AWG	3 x 22 AWG	3 x 22 AWG	
cULus	cULus	cULus	cULus	cULus
C04 AEL-00-VY-050M				C04 AEL-00-VY-050M

Inductive

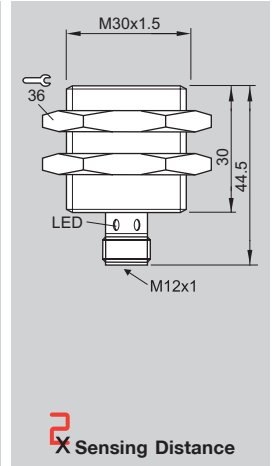
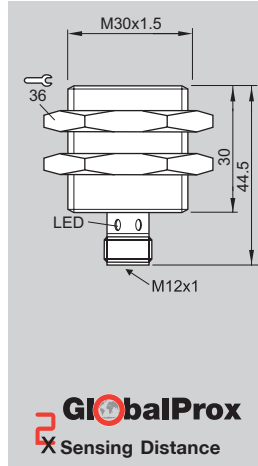
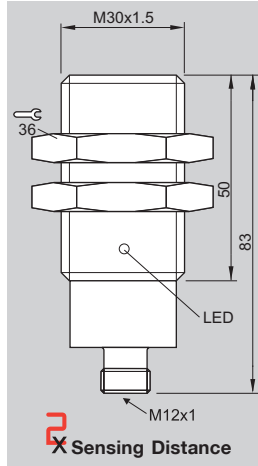
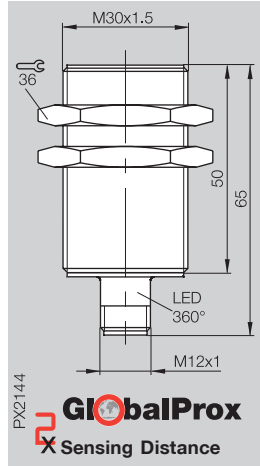
1

- Contents
- Selection Charts
- Part Numbers
- Featured
 - GlobalProx®
 - DC 3-Wire
 - DC 2-Wire
 - SteelFace®
 - 2x
 - 3x
 - Fe/NFe
 - Welding
 - Factor 1
 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories
- 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
 - DC 2-Wire Block
- Specialty
 - SuperShorties™
 - Proxinox®
 - High Temp
 - Analog
 - Large Housing
 - Ring Sensor



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

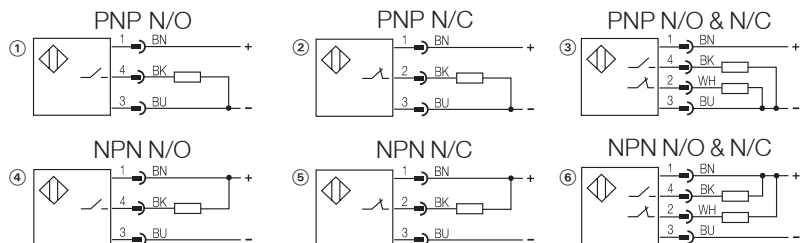
Housing Size	M30x1.5	M30x1.5	M30x1.5	M30x1.5
Mounting	flush*	flush*	flush*	flush*
Rated Operating Distance s _n	15 mm	15 mm	15 mm	15 mm
Assured Operating Distance s _a	0...12.2 mm	0...12.0 mm	0...12.0 mm	0...12.0 mm



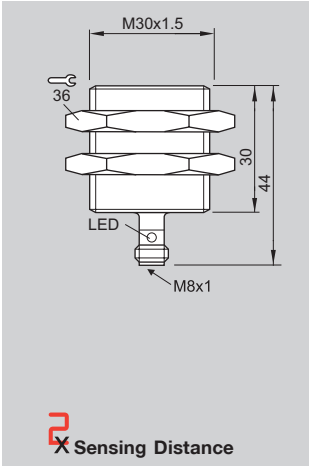
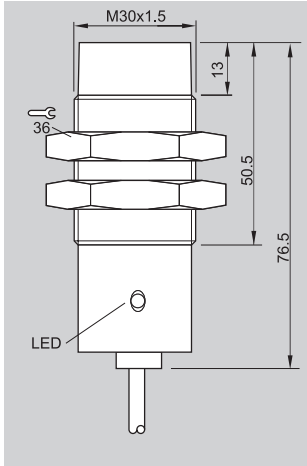
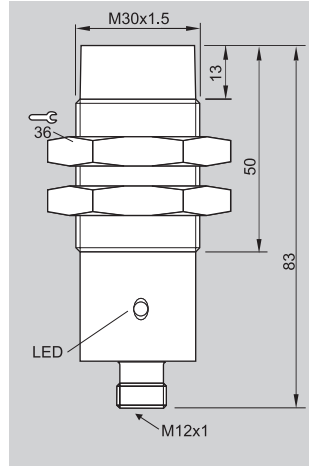
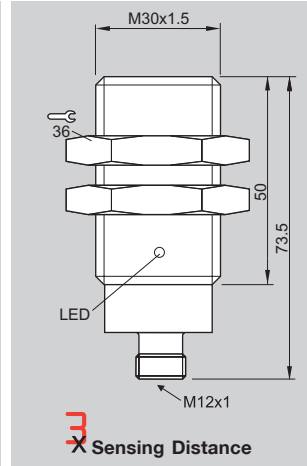
PNP	Normally-open ①	BES M30MI-PSC15B-S04K	BES 516-327-G-S4-H	BESM30ME-PSC15B-S04G-003	BES 516-327-G-E5-Y-S4
	Normally-closed ②	BES M30MI-POC15B-S04K		BESM30ME-POC15B-S04G-003	BES 516-3028-G-E5-Y-S4
	Complementary ③		BES 516-114-G-S4-H		
NPN	Normally-open ④	BES M30MI-NSC15B-S04K			
	Normally-closed ⑤	BES M30MI-NOC15B-S04K			
	Complementary ⑥				
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc	
Supply Voltage U _B	10...30 Vdc	10...55 Vdc	10...30 Vdc	10...30 Vdc	
Voltage Drop U _d at I _e	≤ 2.5 V	≤ 2.5 V	≤ 3.5 V	≤ 3.5 V	
Rated Insulation Voltage U _i	250 Vac	250 Vac	75 Vdc	75 Vdc	
Load Current Capacity	200 mA	200 mA	130 mA	130 mA	
Current Consumption (closed/open)	≤ 10 mA/≤ 5 mA	≤ 15 mA/≤ 10 mA	≤ 25 mA/≤ 12 mA	≤ 25 mA/≤ 12 mA	
Off-state Current I _r	≤ 10 μA	≤ 80 μA	≤ 80 μA	≤ 80 μA	
Protected Against Polarity Reversal	yes	yes	yes	yes	
Short Circuit Protected	yes	yes	yes	yes	
Load Capacitance	≤ 0.5 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	100 Hz	150 Hz	75 Hz	100 Hz	
Function Indication	yes	yes	yes	yes	
Degree of Protection per IEC 60529	IP 67	IP 68	IP 68	IP 68	
Housing Material	brass, Ni free coated	nickel plated brass	nickel plated brass	nickel plated brass	
Material of Sensing Face	PA 12	PA 12	PA 12	PA 12	
Connection	connector	connector	connector	connector	
No. of Wires x Gauge					
Approvals	cULus	cULus	cULus	cULus	
Recommended Connector	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	

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

Wiring Diagrams



Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

M30x1.5 flush* 15 mm 0...12.0 mm	M30x1.5 non-flush 15 mm 0...12.2 mm	M30x1.5 non-flush 15 mm 0...12.2 mm	M30x1.5 quasi-flush* 22 mm 0...17.6 mm
			
BES 516-327-G-E5-Y-S49	BES 516-362-BO-C-PU-05 BES 516-3029-BO-C-PU-05 BES 516-125-BO-C-03	BES 516-362-S4-C BES 516-3029-S4-C BES 516-125-S4-C	BES M30MI1-PSC22B-S04G BES M30MI1-POC22B-S04G
BES 516-359-G-E5-Y-S49	BES 516-363-BO-C-PU-05 BES 516-3033-BO-C-PU-05 BES 516-126-BO-C-03	BES 516-363-S4-C BES 516-3033-S4-C BES 516-126-S4-C	BES M30MI1-NSC22B-S04G
24 Vdc	24 Vdc	24 Vdc	24 Vdc
10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
≤ 3.5 V	≤ 2.5 V	≤ 2.5 V	≤ 2.0 V
75 Vdc	250 Vac	250 Vac	75 Vdc
130 mA	200 mA	200 mA	200 mA
≤ 25 mA/≤ 12 mA	≤ 25 mA/≤ 12 mA	≤ 25 mA/≤ 12 mA	≤ 12 mA/≤ 10 mA
≤ 80 μA	≤ 80 μA	≤ 80 μA	≤ 100 μA
yes	yes	yes	yes
yes	yes	yes	yes
≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF
≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
100 Hz	100 Hz	100 Hz	200 Hz
yes	yes	yes	yes
IP 67	IP 68/IP 67†	IP 68/IP 67†	IP 67
nickel plated brass	nickel plated brass	nickel plated brass	chrome plated brass
PA 12	PA 12	PA 12	PBTP
connector	cable	connector	connector
cULus	(4)† 3 × 22 AWG cULus	cULus	
C49 ANE-00-VY-050M		C04 AEL-00-VY-050M	C04 AEL-00-VY-050M

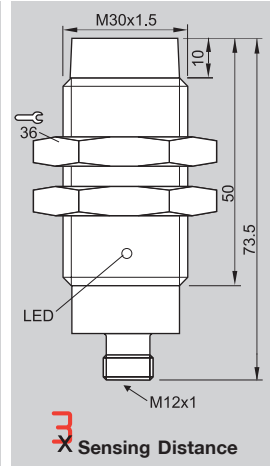
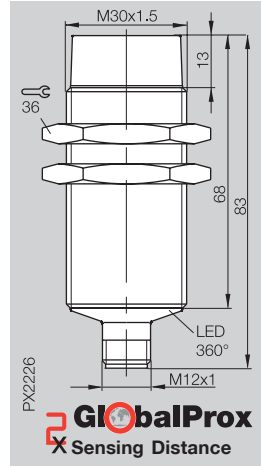
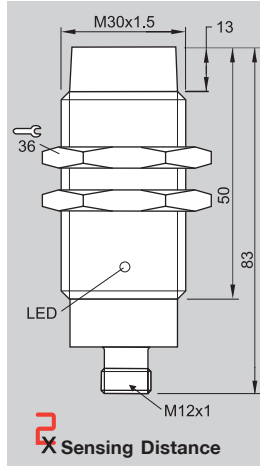
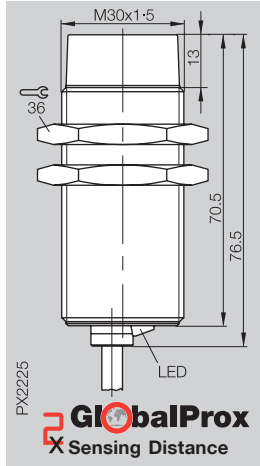
† complementary

† complementary



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

Housing Size	M30x1.5	M30x1.5	M30x1.5	M30x1.5
Mounting	non-flush*	non-flush*	non-flush*	non-flush*
Rated Operating Distance s _n	30 mm	30 mm	30 mm	40 mm
Assured Operating Distance s _a	0...24.3 mm	0...24 mm	0...24.3 mm	0...32 mm



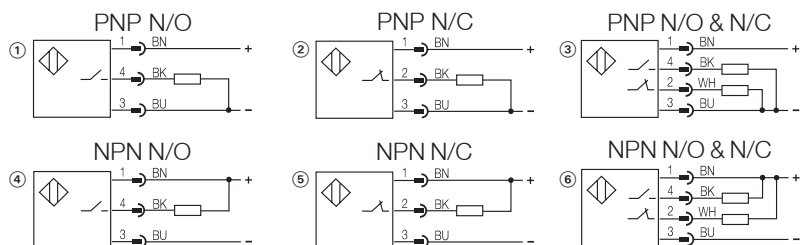
PNP	Normally-open ①	BES M30MM-PSC30F-BV02	BES 516-362-G-S4-H	BES M30MM-PSC30F-S04K	BES M30MG1-PSC40F-S04G
	Normally-closed ②	BES M30MM-POC30F-BV02		BES M30MM-POC30F-S04K	
	Complementary ③				
NPN	Normally-open ④	BES M30MM-NSC30F-BV02		BES M30MM-NSC30F-S04K	BES M30MG1-NSC40F-S04G
	Normally-closed ⑤	BES M30MM-NOC30F-BV02		BES M30MM-NOC30F-S04K	
	Complementary ⑥				
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc	
Supply Voltage U _B	10...30 Vdc	10...55 Vdc	10...30 Vdc	10...30 Vdc	
Voltage Drop U _d at I _e	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V	≤ 2.0 V	
Rated Insulation Voltage U _i	250 Vac	250 Vac	250 Vac	75 Vdc	
Load Current Capacity	200 mA	200 mA	200 mA	200 mA	
Current Consumption (closed/open)	≤ 10 mA/≤ 3 mA	≤ 15 mA/≤ 10 mA	≤ 10 mA/≤ 3 mA	≤ 10 mA/≤ 10 mA	
Off-state Current I _r	≤ 10 μA	≤ 80 μA	≤ 10 μA	≤ 100 μA	
Protected Against Polarity Reversal	yes	yes	yes	yes	
Short Circuit Protected	yes	yes	yes	yes	
Load Capacitance	≤ 0.5 μF	≤ 1.0 μF	≤ 0.5 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	300 Hz	70 Hz	300 Hz	100 Hz	
Function Indication	yes	yes	yes	yes	
Degree of Protection per IEC 60529	IP 67	IP 68	IP 67	IP 54	
Housing Material	brass, Ni free coated	nickel plated brass	brass, Ni free coated	chrome plated brass	
Material of Sensing Face	PBT	PA 12	PBT	PBTP	
Connection	cable	connector	connector	connector	
No. of Wires x Gauge	3 x 22 AWG				
Approvals	cULus	cULus	cULus		
Recommended Connector		C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	

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

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

Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

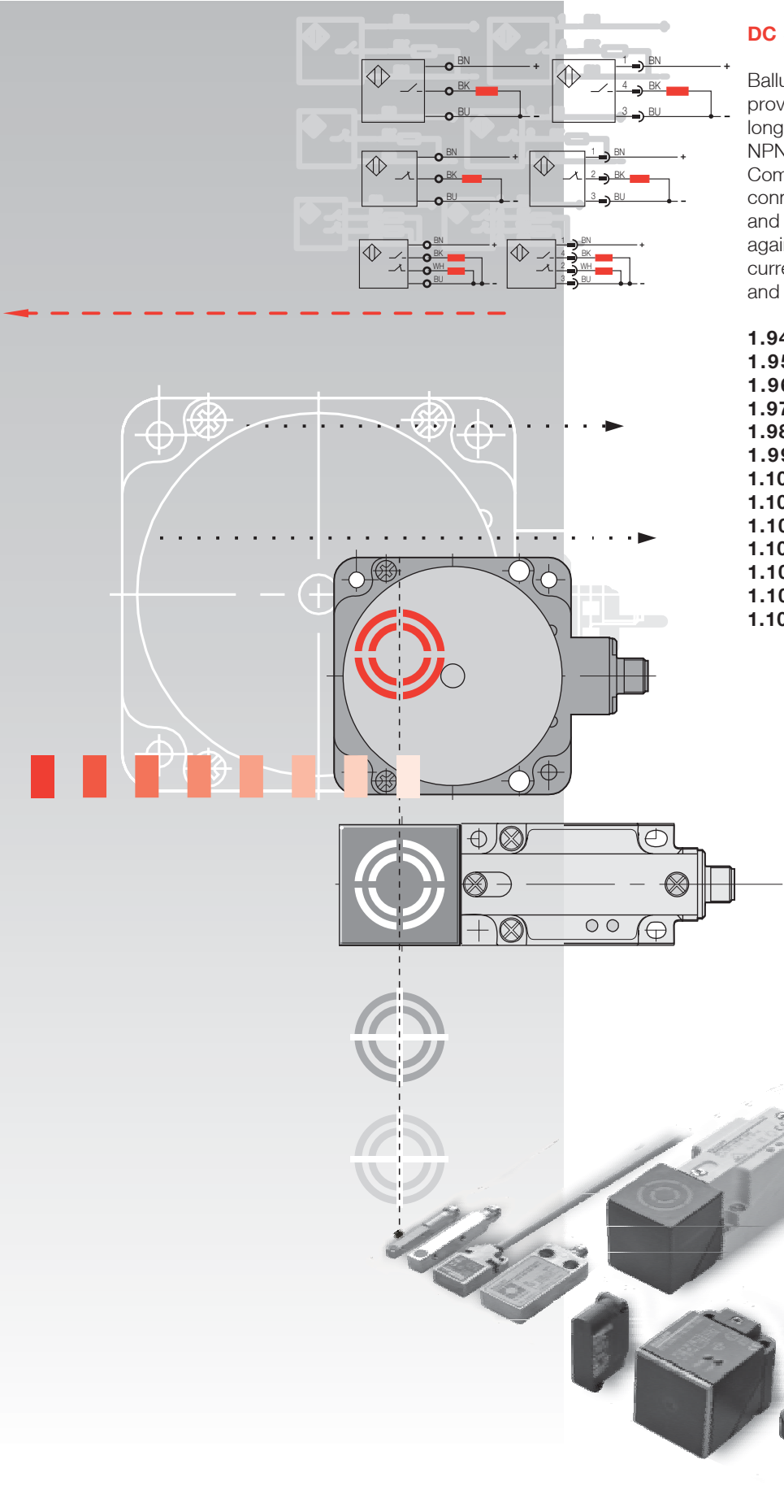
Wiring Diagrams



DC 3- and 4-Wire Block Sensors

Balluff's DC 3- and 4-wire block sensors provide added installation flexibility and longer sensing range. Available with PNP, NPN, Normally-open, Normally-closed, or Complementary outputs plus a range of connection options. Most Balluff DC 3- and 4-wire block sensors are protected against short circuits, polarity reversal, current overloads, and voltage spikes, and come with Balluff's lifetime warranty.

- 1.94** 5x5x25, 5x5x33, 8x8x40
- 1.95** 8x8x59, 8x8x40
- 1.96** 8x8x59, 8x16x4
- 1.97** 8x16x4
- 1.98** 10x30x6, 16.5x30x10.5
- 1.99** 26x40x12
- 1.100** 17.5x17.3x28.5
- 1.102** 25x50x10
- 1.103** 20x32x8
- 1.104** 42x48x22, 60.5x74x28
- 1.105** 40x40x62 Unicomact
- 1.106** 40x40x120 Unisensor
- 1.108** 80x80x40 Maxisensor



- Contents
- Selection Charts
- Part Numbers
- Featured
 - GlobalProx®
 - DC 3-Wire
 - DC 2-Wire
 - SteelFace®
 - 2x
 - 3x
 - Fe/NFe
 - Welding
 - Factor 1
 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories

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
- DC 2-Wire Block

Specialty

- SuperShorties™
- Proxinox®
- High Temp
- Analog
- Large Housing
- Ring Sensor

6

Connectors

7

Accessories

O

Product Overview

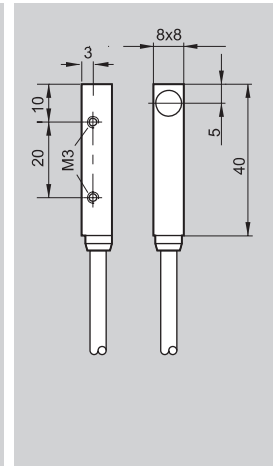
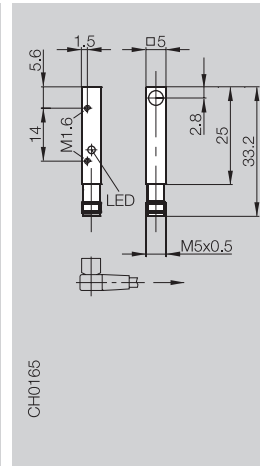
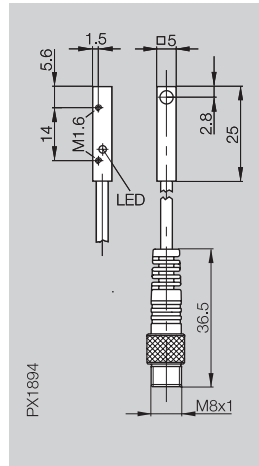
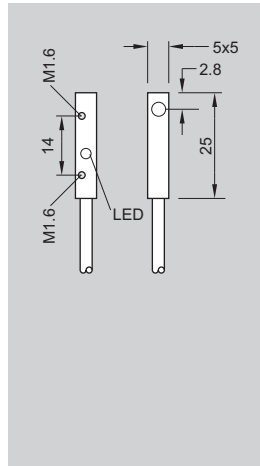
t

Technical Reference

p

Part Number Index

Housing Size	5×5×25	5×5×25	5×5×33	8×8×40
Mounting	flush	flush	flush	flush
Rated Operating Distance s _n	0.8 mm	0.8 mm	0.8 mm	1.5 mm
Assured Operating Distance s _a	0...0.6 mm	0...0.6 mm	0...0.6 mm	0...1.2 mm

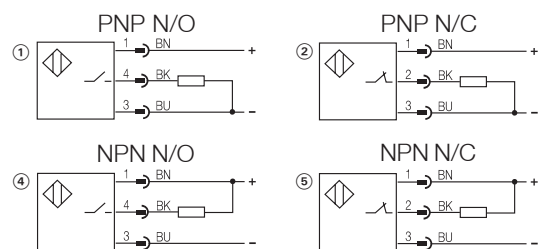


PNP	Normally-open ①	BES 516-3040-I02-C-PU-05	BES 516-3040-I02-C-S49-00,3	BES Q05AC-PSC08B-S26	BES 516-300-S166-PU-05
	Normally-closed ②	BES 516-3042-I02-C-PU-05		BES Q05AC-POC08B-S26	BES 516-300-S180-PU-06
NPN	Normally-open ④	BES 516-3041-I02-C-PU-05		BES Q05AC-NSC08B-S26	BES 516-300-S170-05
	Normally-closed ⑤	BES 516-3043-I02-C-PU-05		BES Q05AC-NOC08B-S26	

Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
Voltage Drop U _d at I _e	≤ 1.0 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
Rated Insulation Voltage U _i	75 Vdc	75 Vdc	75 Vdc	75 Vdc
Load Current Capacity	150 mA	100 mA	100 mA	200 mA
Current Consumption (closed/open)	≤ 10 mA/≤ 1.5 mA	≤ 10 mA/≤ 1.5 mA	≤ 10 mA	≤ 20 mA/≤ 12 mA
Off-state Current I _r	≤ 50 μA	≤ 50 μA	≤ 10 μA	≤ 80 μA
Protected Against Polarity Reversal	yes	yes	yes	yes
Short Circuit Protected	yes	yes	yes	yes
Load Capacitance	≤ 0.1 μF	≤ 0.1 μF	≤ 0.2 μF	≤ 0.5 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	1000 Hz	3000 Hz	3000 Hz	1000 Hz
Function Indication	yes	yes	yes	no
Degree of Protection per IEC 60529	IP 65	IP 67	IP 67	IP 67
Housing Material	anodized aluminum	anodized aluminum	anodized aluminum	nickel plated zinc
Material of Sensing Face	POM	POM	POM	PA12
Connection	cable	cable with connector	connector	cable
No. of Wires × Gauge	3 × 26 AWG			3 × 26 AWG
Approvals	cULus	cULus	cULus	cULus
Recommended Connector		C49 ANE-00-VY-050	BKS-B25/BKS-B26	

Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

Wiring Diagrams



DC 3-4-Wire

Inductive Sensors

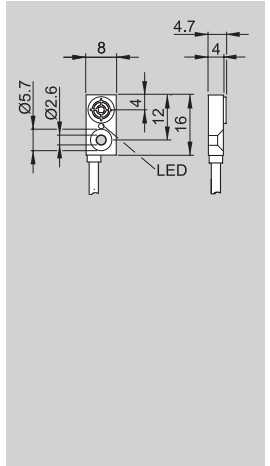
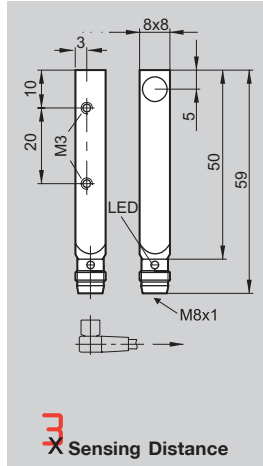
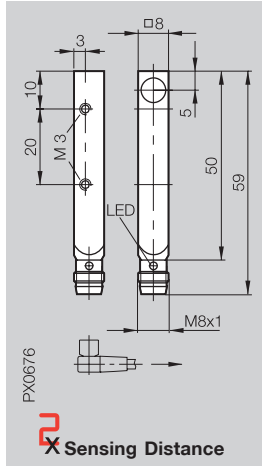
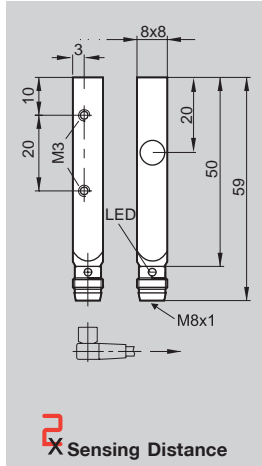
DC 3-4-Wire
Block
S_n 1.5 mm, 2 mm

8x8x59 flush 1.5 mm 0...1.2mm	8x8x59 flush 1.5 mm 0...1.2mm	8x8x40 flush 2 mm 0...1.6 mm	8x8x40 flush 2 mm 0...1.6 mm	8x8x59 flush 2 mm 0...1.6 mm
BES 516-300-S166-S49 BES 516-300-S180-S49	BES 516-300-S202-S49	BES Q08ZC-PSC20B-BV03 BES Q08ZC-POC20B-BV03	BES Q08ZE-PSC20B-BV03 BES Q08ZE-POC20B-BV03	BES Q08ZC-PSC20B-S49G BES Q08ZC-POC20B-S49G
BES 516-300-S170-S49	BES 516-300-S254-S49	BES Q08ZC-NSC20B-BP03 BES Q08ZC-NOC20B-BP03		BES Q08ZC-NSC20B-S49G BES Q08ZC-NOC20B-S49G
24 Vdc 10...30 Vdc ≤ 2.5 V 75 Vdc 200 mA ≤ 20 mA/≤ 12 mA ≤ 80 µA yes yes ≤ 0.5 µF	24 Vdc 10...30 Vdc ≤ 2.5 V 75 Vdc 200 mA ≤ 20 mA/≤ 12 mA ≤ 80 µA yes yes ≤ 0.5 µF	24 Vdc 10...30 Vdc ≤ 2.5 V 75 Vdc 200 mA ≤ 20 mA/≤ 12 mA ≤ 80 µA yes yes ≤ 0.5 µF	24 Vdc 10...30 Vdc ≤ 2.5 V 75 Vdc 200 mA ≤ 20 mA/≤ 12 mA ≤ 80 µA yes yes ≤ 0.5 µF	24 Vdc 10...30 Vdc ≤ 2.5 V 75 Vdc 200 mA ≤ 20 mA/≤ 12 mA ≤ 80 µA yes yes ≤ 0.5 µF
≤ 5 % -25...+70 °C 1000 Hz IP 67 nickel plated zinc PA12 connector	≤ 5 % -25...+70 °C 1000 Hz IP 67 nickel plated zinc PA12 connector	≤ 5 % -25...+70 °C 1000 Hz IP 65 nickel plated zinc PA 12 cable 3 × 26 AWG cULus	≤ 5 % -25...+70 °C 1000 Hz IP 65 nickel plated zinc PA 12 cable 3 × 26 AWG cULus	≤ 5 % -25...+70 °C 1000 Hz IP 65 nickel plated zinc PA 12 connector cULus C49 ANE-00-VY-050M
C49 ANE-00-VY-050M	C49 ANE-00-VY-050M			C49 ANE-00-VY-050M



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

Housing Size	8x8x59	8x8x59	8x8x59	8x16x4
Mounting	flush	flush	flush*	flush
Rated Operating Distance s _n	2 mm	2.5 mm	3 mm	1.5 mm
Assured Operating Distance s _a	0...1.6 mm	0...2 mm	0...2.4 mm	0...1.2 mm

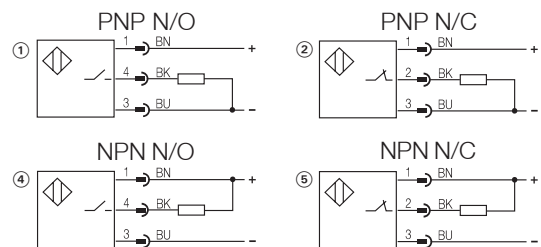


PNP	Normally-open ①	BES Q08ZE-PSC20B-S49G	BES Q08ZC-PSC25B-S49G	BES Q08MG-PSC30B-S49G	BES R04KC-PSC15B-EV05
	Normally-closed ②	BES Q08ZE-POC20B-S49G			BES R04KC-POC15B-EV05
NPN	Normally-open ④	BES Q08ZE-NSC20B-S49G		BES Q08MG-NSC30B-S49G	BES R04KC-NSC15B-EV05
	Normally-closed ⑤	BES Q08ZE-NOC20B-S49G			BES R04KC-NOC15B-EV05
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc	
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	10...30 Vdc	5...30 Vdc	
Voltage Drop U _d at I _e	≤ 2.5 V	≤ 2.5 V	≤ 2.0 V	≤ 1.5 V	
Rated Insulation Voltage U _i	75 Vdc	75 Vdc	75 Vdc	75 Vdc	
Load Current Capacity	200 mA	200 mA	200 mA	100 mA	
Current Consumption (closed/open)	≤ 20 mA/≤ 12 mA	≤ 12 mA	≤ 10 mA/≤ 10 mA	≤ 10 mA	
Off-state Current I _r	≤ 80 µA	≤ 80 µA	≤ 10 µA	≤ 50 µA	
Protected Against Polarity Reversal	yes	yes	yes	no	
Short Circuit Protected	yes	yes	yes	yes	
Load Capacitance	≤ 0.5 µF	≤ 0.5 µF	≤ 1.0 µF	≤ 0.1 µF	
Repeat Accuracy R	≤ 5 %	≤ 5 %	≤ 5 %	≤ 1 %	
Ambient Temperature Range T _a	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	
Operating Frequency f	1000 Hz	2000 Hz	1000 Hz	1000 Hz	
Function Indication	yes	yes	yes	yes	
Degree of Protection per IEC 60529	IP 65	IP 67	IP 67	IP 67	
Housing Material	nickel plated zinc	nickel plated zinc	chrome plated brass	PA 6	
Material of Sensing Face	PA 12	POM	PBTP	PA 6	
Connection	connector	connector	connector	cable	
No. of Wires × Gauge				3 x 28 AWG	
Approvals	cULus	cULus		cULus	
Recommended Connector	C49 ANE-00-VY-050M	C49 ANE-00-VY-050M	C49 ANE-00-VY-050M		

* See technical section for proper mounting of 3x range sensors.

Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

Wiring Diagrams



DC 3-4-Wire

Inductive Sensors

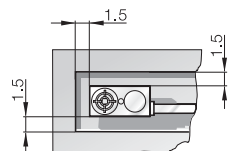
DC 3-4-Wire
Block
s_n 1.5 mm, 2.5

8x16x4 flush 1.5 mm 0...1.2 mm	8x16x4 flush 1.5 mm 0...1.2 mm	8x16x4 non-flush 2.5 mm 0...2.0 mm	8x16x4 non-flush 2.5 mm 0...2.0 mm
BES R04KC-PSC15B-EP00,2-GS26 BES R04KC-POC15B-EP00,2-GS26	BES R04KC-PSC15B-EP00,13-GS49 BES R04KC-POC15B-EP00,13-GS49	BES R04KC-PSC25F-EV05	BES R04KC-PSC25F-EP00,3-GS49
BES R04KC-NSC15B-EP00,2-GS26 BES R04KC-NOC15B-EP00,2-GS26	BES R04KC-NSC15B-EP00,13-GS49 BES R04KC-NOC15B-EP00,13-GS49		
24 Vdc 10...30 Vdc ≤ 3 V 75 Vdc 100 mA ≤ 12 mA ≤ 50 µA no yes ≤ 0.1 µF	24 Vdc 5...30 Vdc ≤ 1.5 V 75 Vdc 100 mA ≤ 10 mA ≤ 50 µA no yes ≤ 0.1 µF	24 Vdc 10...30 Vdc ≤ 3.0 V 75 Vdc 100 mA ≤ 12 mA ≤ 50 µA no yes ≤ 0.03 µF	24 Vdc 10...30 Vdc ≤ 2.5 V 75 Vdc 100 mA ≤ 10 mA ≤ 50 µA no yes ≤ 0.03 µF
≤ 5 % -25...+70 °C 600 Hz yes IP 67 PA 6 PA 6 cable with connector	≤ 1 % -25...+70 °C 1000 Hz yes IP 67 PA 6 PA 6 cable with connector	≤ 5 % -25...+70 °C 200 Hz yes IP 67 PA 6 PA 6 5 m cable PVC 3 x 28 AWG cULus	≤ 5 % -25...+70 °C 150 Hz yes IP 67 PA 6 PA 6 cable with connector
cULus BKS-B 25...	cULus C49 ANE-00-VY-050M	cULus	cULus C49 ANE-00-VY-050M

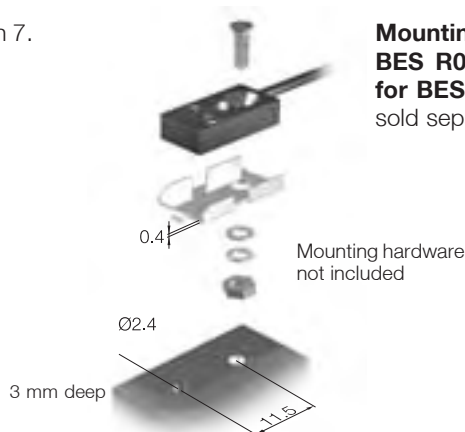
- For mounting brackets & accessories see section 7.
- For mating connectors see section 6.

Mounting for BES R04... with s_n 2.5 mm

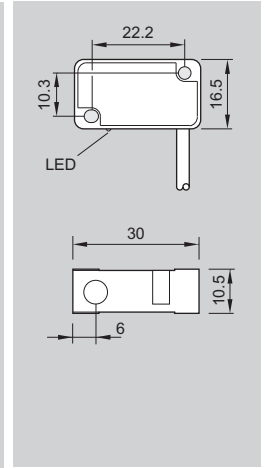
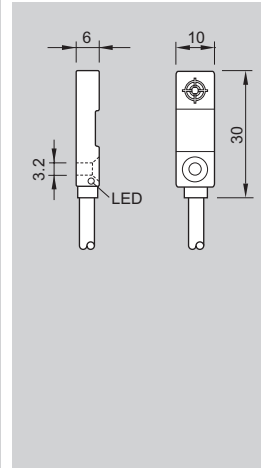
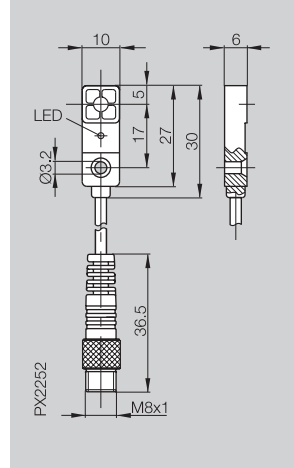
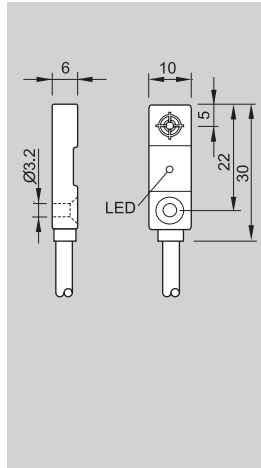
Aluminium: can be flush mounted. Steel: must leave 1.5 mm Freezone



Mounting Bracket BES R04-MF-01
for BES R04... with s_n 1.5 mm
sold separately



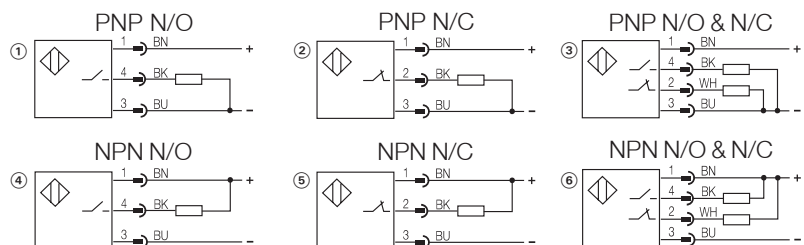
Housing Size	10×30×6	10×30×6	10×30×6	16.5×30×10.5
Mounting	flush	flush	non-flush	flush
Rated Operating Distance s _n	3 mm	3 mm	3 mm	2 mm
Assured Operating Distance s _a	0...2.4 mm	0...2.4 mm	0...2.4 mm	0...1.6 mm



PNP	Normally-open ①	BES R03KC-PSC30B-EP05	BES R03KC-PSC30B-BP00,3-GS49	BES R03KC-PSC30F-BV03	BES 517-398-NO-C-PU-03
	Normally-closed ②	BES R03KC-POC30B-EP05			BES 517-351-NO-C-03
NPN	Normally-open ④	BES R03KC-NSC30B-EP05		BES R03KC-NSC30F-BV03	BES 517-399-NO-C-03
	Normally-closed ⑤	BES R03KC-NOC30B-EP05			BES 517-352-NO-C-03

Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	5...30 Vdc	5...30 Vdc	10...30 Vdc	10...30 Vdc
Voltage Drop U _d at I _e	≤ 1.5 V	≤ 1.5 V	≤ 1.5 V	≤ 1.5 V
Rated Insulation Voltage U _i	75 Vdc	75 Vdc	75 Vdc	75 Vdc
Load Current Capacity	100 mA	100 mA	100 mA	200 mA
Current Consumption (closed/open)	≤ 10 mA	≤ 6 mA	≤ 15 mA	≤ 10 mA/≤ 3 mA
Off-state Current I _r	≤ 50 µA	≤ 80 µA	≤ 80 µA	≤ 80 µA
Protected Against Polarity Reversal	no	no	no	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	≤ 1 %	≤ 1 %	≤ 10 %	≤ 5 %
Ambient Temperature Range T _a	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
Operating Frequency f	1000 Hz	1000 Hz	500 Hz	2500 Hz
Function Indication	yes	yes	yes	yes
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67	IP 65
Housing Material	PA 6-GF30	PA 6	ABS 757	PBTP
Material of Sensing Face	PA 6-GF 30	PA 6	ABS 757	PBTP
Connection	cable	cable with connector	cable	cable
No. of Wires x Gauge	3 x 28 AWG		3 x 26 AWG	3 x 26 AWG
Approvals	cULus	cULus	cULus	
Recommended Connector		C49 ANE-00-VY-050M		

Wiring Diagrams

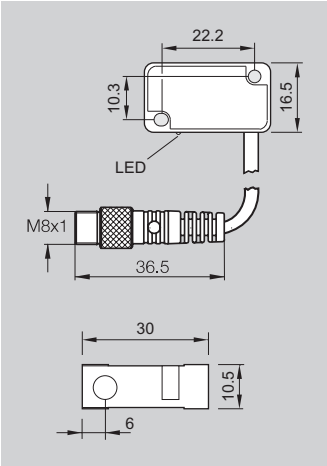
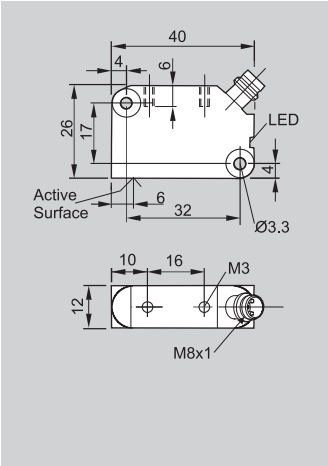
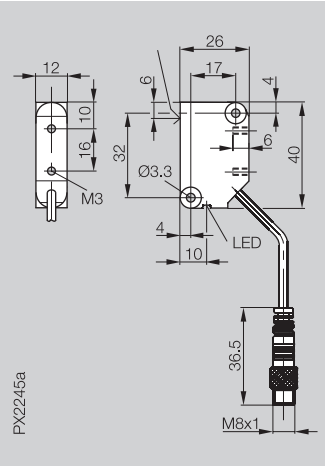
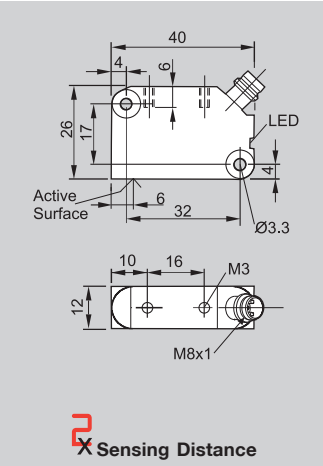


Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

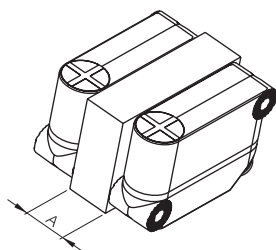
DC 3-4-Wire

Inductive Sensors

DC 3-4-Wire
Block
s_n 2 mm, 4 mm

16.5x30x10.5	26x40x12	26x40x12	26x40x12
flush	flush		flush
2 mm	2 mm	2 mm	4 mm
0...1.6 mm	0...1.6 mm	0...1.6 mm	0...3.2 mm
			
BES 517-398-N0-C-S49-00,2 BES 517-351-N0-C-S49-00,2	BES R05KB-PSC20B-S49A	BES R05KB-PSC20B-BP00, 3-GS49	BES R05KB-PSC40B-S49A BES R05KB-POC40B-S49A
BES 517-399-N0-C-S49-00,2			BES R05KB-NSC40B-S49A
24 Vdc	24 Vdc	24 Vdc	24 Vdc
10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
≤ 2.0 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
75 Vdc	75 Vdc	75 Vdc	75 Vdc
200 mA	200 mA	200 mA	200 mA
≤ 10 mA/≤ 3 mA	≤ 9 mA	≤ 9 mA	≤ 9 mA
≤ 80 μA	≤ 80 μA	≤ 80 μA	≤ 80 μA
yes	yes	yes	yes
yes	yes	yes	yes
≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF
≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
2500 Hz	400 Hz	400 Hz	400 Hz
yes	yes	yes	yes
IP 65	IP 67	IP 67	IP 67
PBTP	PA 12	PA 12	PA
PBTP	PA 12	PA 12	PA
cable with connector	connector	cable with connector	connector
	cULus	cULus	cULus
C49 ANE-00-VY-050M	C49 ANE-00-VY-050M	C49 ANE-00-VY-050M	C49 ANE-00-VY-050M

Row Mounting

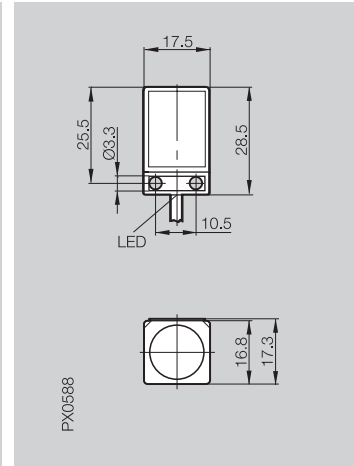
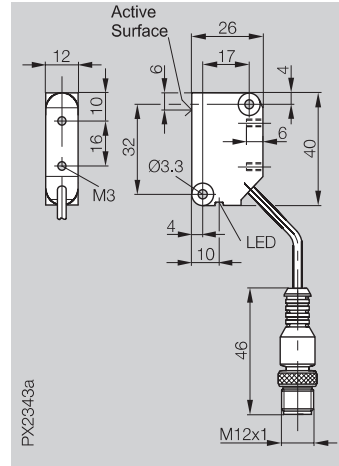
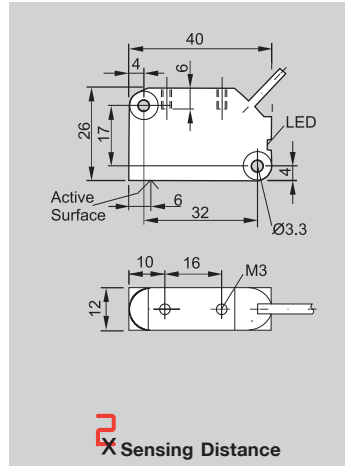


- R05 with s_n 2 mm**
– can be mounted without a gap
- R05 with s_n 4 mm**
– if non-metallic, distance A should be at least 17 mm
– if metallic, distance A should be at least 12 mm

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

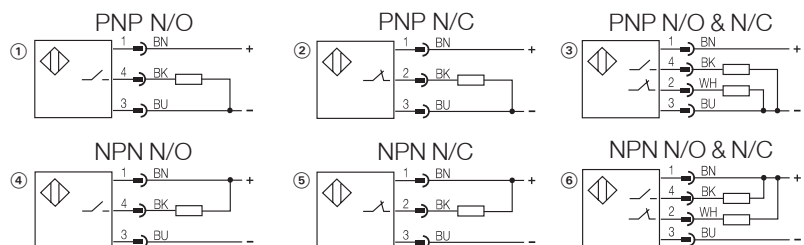


Housing Size	26×40×12	26×40×12	17.5×17.3×28.5
Mounting	flush	flush	flush
Rated Operating Distance s _n	4 mm	4 mm	3 mm
Assured Operating Distance s _a	0...3.2 mm	0...3.2 mm	0...2.4 mm



PNP	Normally-open ① Normally-closed ②	BES R05KB-PSC40B-EV03	BES R05KB-PSC40B-EP00,3-GS04	BES 517-1603-QP-S-03
NPN	Normally-open ④ Normally-closed ⑤	BES R05KB-NOC40B-EV03		BES 517-1603-QN-S-03
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
Voltage Drop U _d at I _e	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V	≤ 1.8 V
Rated Insulation Voltage U _i	75 Vdc	250 Vdc	75 Vdc	75 Vdc
Load Current Capacity	200 mA	200 mA	50 mA	50 mA
Current Consumption (closed/open)	≤ 9 mA	≤ 9 mA	≤ 20 mA	≤ 20 mA
Off-state Current I _r	≤ 80 µA			
Protected Against Polarity Reversal	yes	yes	yes	yes
Short Circuit Protected	yes	yes	yes	yes
Load Capacitance	≤ 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	400 Hz	400 Hz	500 Hz	500 Hz
Function Indication	yes	yes	yes	yes
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67	IP 67
Housing Material	PA 12	PA 12	AES/CP	AES/CP
Material of Sensing Face	PA 12	PA 12	AES/CP	AES/CP
Connection	cablE, PVC	cablE with connector	cablE	cablE
No. of Wires × Gauge	3 × 26 AWG			
Approvals	cULus	cULus		
Recommended Connector		C04 AEL-00-VY-050M		

Wiring Diagrams



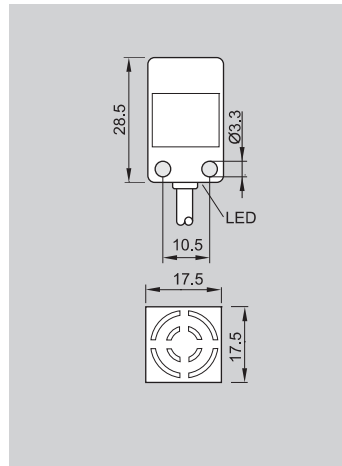
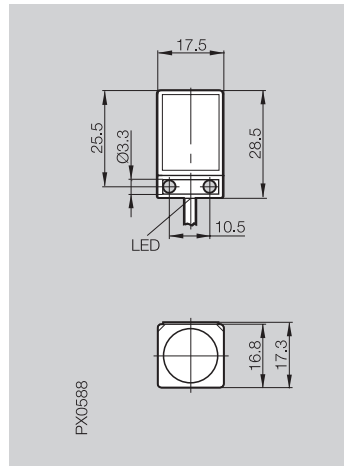
Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

DC 3-/4-Wire

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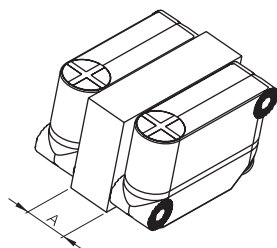
DC 3-/4-Wire
Block
s_n 5 mm

17.5×17.3×28.5	17.5×17.5×28.5
non-flush	non-flush
5 mm	5 mm
0...4.1 mm	0...4 mm



BES 517-1605-QP-S-03	BES 517-1605-CP-S-05
BES 517-1605-QN-S-03	BES 517-1605-CN-S-05
24 Vdc	24 Vdc
10...30 Vdc	10...30 Vdc
≤ 1.8 V	≤ 1.8 V
75 Vdc	75 Vdc
50 mA	50 mA
≤ 20 mA	≤ 20 mA/≤ 12 mA
≤ 80 μA	≤ 80 μA
yes	yes
yes	yes
≤ 5 %	≤ 5 %
-25...+70 °C	-25...+70 °C
500 Hz	500 Hz
yes	yes
IP 67	IP 67
AES/CP	ABS 757
AES/CP	ABS 757
cable	cable
3 × 26 AWG	3 × 26 AWG

Row Mounting



R05 with s_n 2 mm

- can be mounted without a gap

R05 with s_n 4 mm

- if non-metallic, distance A should be at least 17 mm

- if metallic, distance A should be at least 12 mm

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



Inductive

1

Contents

Selection Charts

Part Numbers

Featured

GlobalProx®
- DC 3-Wire
- DC 2-Wire

SteelFace®
- 2x
- 3x
- Fe/NFe

Welding
- Factor 1
- Weld Field Immune
- SlagMaster®
- Welding Accessories

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

DC 2-Wire Block

Specialty

SuperShorties™
Proxinox®
High Temp
Analog
Large Housing
Ring Sensor

6

Connectors

7

Accessories

o

Product Overview

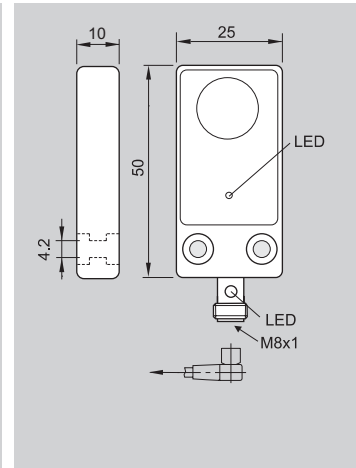
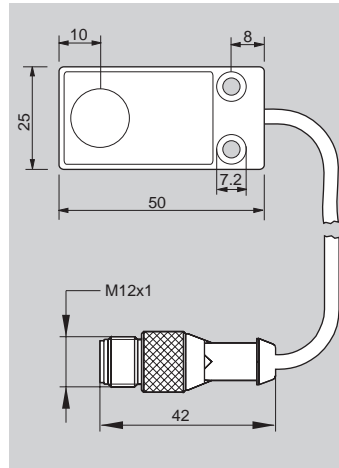
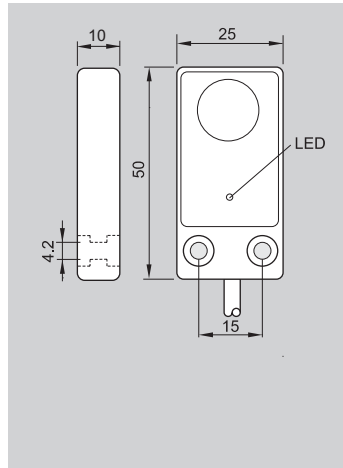
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Technical Reference

p

Part Number Index

Housing Size	25×50×10	25×50×10	25×50×10
Mounting	flush	flush	flush
Rated Operating Distance s _n	5 mm	5 mm	5 mm
Assured Operating Distance s _a	0...4 mm	0...4 mm	0...4 mm



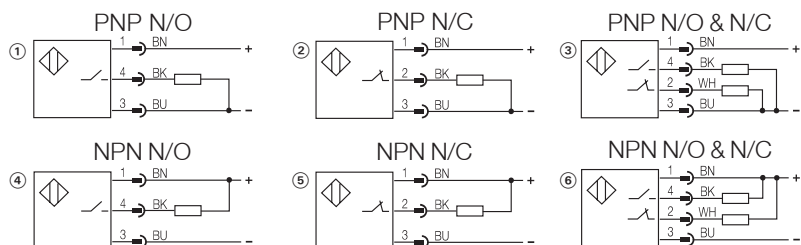
PNP	Normally-open ①	BES 516-347-M0-C-05	BES 516-347-M0-C-S4-00,3	BES 516-347-M0-C-S49
	Normally-closed ②			
	Complementary ③	BES 516-133-M0-C-05	BES 516-133-M0-C-S4-00,3	

NPN	Normally-open ④	BES 516-345-M0-C-05		
	Normally-closed ⑤			
	Complementary ⑥			

Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	10...30 Vdc
Voltage Drop U _d at I _e	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
Rated Insulation Voltage U _i	75 Vdc	75 Vdc	75 Vdc
Load Current Capacity	200 mA	200 mA	200 mA
Current Consumption (closed/open)	≤ 25 mA/≤ 12 mA	≤ 25 mA/≤ 12 mA	≤ 25 mA/≤ 12 mA
Off-state Current I _r	≤ 80 μA	≤ 80 μA	≤ 80 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	500 Hz	500 Hz	500 Hz
Function Indication	yes	yes	yes
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67
Housing Material	aluminum alloy	aluminum alloy	aluminum alloy
Material of Sensing Face	PBTB	PBTB	PBTB
Connection	cable	cable with connector	connector
No. of Wires×Gauge	3 × 26 AWG		
Approvals			
Recommended Connector		C04 AEL-00-VY-050M	C49 ANE-00-VY-050M

Wiring Diagrams



Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

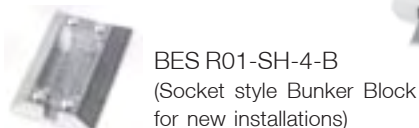
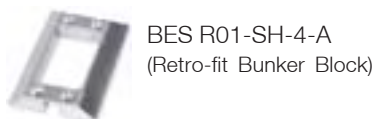
DC 3-4-Wire

Inductive Sensors

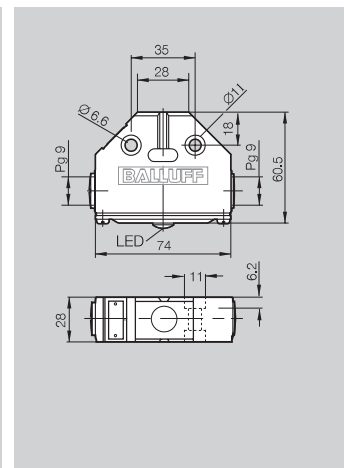
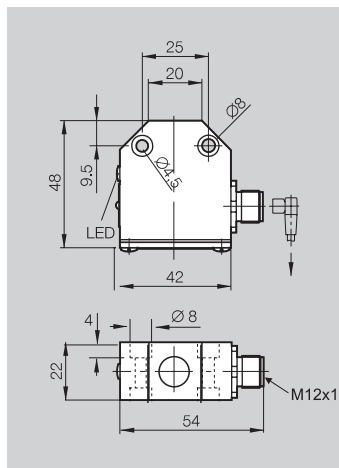
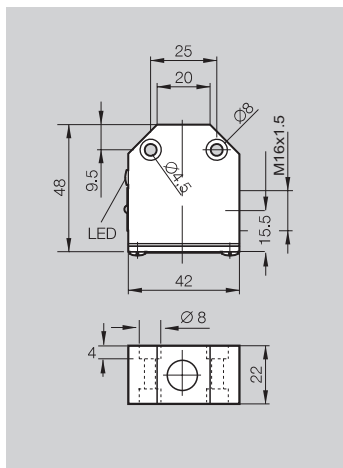
DC 3-4-Wire
Block
S_n 7 mm

20x32x8	20x32x8	20x32x8
flush	flush	flush
7 mm	7 mm	7 mm
0...5.7 mm	0...5.7 mm	0...5.7 mm
BES R01ZC-PAC70B-BP03	BES R01ZC-PAC70B-BP00.2-GS04	BES R01ZC-PSC70B-BP00.2-GS49
BES R01ZC-NAC70B-BP03	BES R01ZC-NAC70B-BP00.2-GS04	BES R01ZC-NSC70B-BP00.2-GS49
24 Vdc	24 Vdc	24 Vdc
10...30 Vdc	10...30 Vdc	10...30 Vdc
≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
75 Vdc	75 Vdc	75 Vdc
200 mA	200 mA	200 mA
≤ 15 mA	≤ 15 mA	≤ 15 mA
≤ 80 µA	≤ 80 µA	≤ 80 µA
yes	yes	yes
yes	yes	yes
≤ 1.0 µF	≤ 1.0 µF	≤ 1.0 µF
≤ 5 %	≤ 5 %	≤ 5 %
-25...+70 °C	-25...+70 °C	-25...+70 °C
150 Hz	150 Hz	150 Hz
yes	yes	yes
IP 67	IP 67	IP 67
GD-Zn	GD-Zn	GD-Zn
PA 12	PA 12	PA 12
cable	cable with connector	cable with connector
4x26 AWG		
cULus	cULus	cULus
	C04 AEL-00-VY-050M	C49 ANE-00-VY-050M

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



Housing Size	42x48x22	42x48x22	60.5x74x28
Mounting	flush	flush	flush
Rated Operating Distance s _n	5 mm	5 mm	7 mm
Assured Operating Distance s _a	0...4 mm	0...4 mm	0...5.7 mm



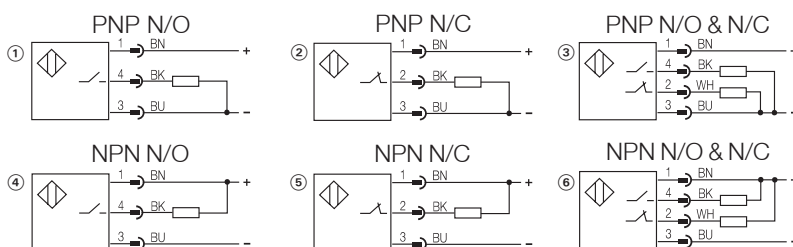
PNP	Normally-open ①	BES 516-346-H2-Y	BES 516-346-H2-Y-S4	BES 516-161-H3-L
	Normally-closed ②	BES 516-341-H2-Y	BES 516-341-H2-Y-S4	
	Complementary ③			

NPN	Normally-open ④	BES 516-344-H2-Y		BES 516-160-H3-L
	Normally-closed ⑤			
	Complementary ⑥			

Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	10...30 Vdc
Voltage Drop U _d at I _B	≤ 3.5 V	≤ 3.5 V	≤ 1.5 V
Rated Insulation Voltage U _i	250 Vac	75 Vdc	75 Vdc
Load Current Capacity	130 mA	130 mA	400 mA
Current Consumption (closed/open)	≤ 25 mA/≤ 15 mA	≤ 25 mA/≤ 12 mA	≤ 30 mA/≤ 20 mA
Off-state Current I _l	≤ 80 μA	≤ 80 μA	≤ 130 μA
Protected Against Polarity Reversal	yes	yes	yes
Short Circuit Protected	yes	yes	no
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	500 Hz	500 Hz	300 Hz
Function/Supply Voltage Indication	yes/—	yes/—	yes/—
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67
Housing Material	aluminum alloy	aluminum alloy	aluminum alloy
Material of Sensing Face	PA 12	PA 12	PA 12
Connection	screw terminals	connector	screw terminals
Approvals			
Recommended Connector		C04 AEL-00-VY-050M	

Wiring Diagrams



Additional models may exist.
Refer to company website for details.

DC 3-4-Wire

Inductive Sensors

DC 3-4-Wire
Unicompact
S_n 20 mm, 25 mm, 30 mm

40x40x62 flush 20 mm 0...16.2 mm	40x40x62 non-flush 25 mm 0...20.3 mm	40x40x62 non-flush 30 mm 0...24.3 mm
BES Q40KFU-PSC20B-S04G		BES Q40KFU-PSC30F-S04G
BES Q40KFU-PAC20B-S04G		BES Q40KFU-PAC30F-S04G
	BES Q40KFU-NAC25F-S04G	
24 Vdc	24 Vdc	24 Vdc
10...30 Vdc	10...30 Vdc	10...30 Vdc
≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
250 Vac	250 Vac	250 Vac
200 mA	200 mA	200 mA
≤ 20 mA	≤ 20 mA	≤ 20 mA
≤ 80 μA	≤ 80 μA	≤ 80 μA
yes	yes	yes
yes	yes	yes
≤ 1.0 μF		≤ 1.0 μF
≤ 5 %	≤ 5 %	≤ 5 %
-25...+70 °C	-25...+70 °C	-25...+70 °C
50 Hz	50 Hz	50 Hz
yes/yes	yes/yes	yes/yes
IP 67	IP 67	IP 67
PBT	PBT	PBT
PBT	PBT	PBT
connector	connector	connector
cULus	cULus	cULus
C04 BEL-00-VY-050M	C04 BEL-00-VY-050M	C04 BEL-00-VY-050M

Refer to Technical Section for Mounting Guidelines



Inductive

1

- Contents
- Selection Charts
- Part Numbers
- Featured
 - GlobalProx®
 - DC 3-Wire
 - DC 2-Wire
 - SteelFace®
 - 2x
 - 3x
 - Fe/NFe
 - Welding
 - Factor 1
 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories

- 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
 - DC 2-Wire Block
- Specialty
 - SuperShorties™
 - Proxinox®
 - High Temp
 - Analog
 - Large Housing
 - Ring Sensor

6 Connectors

7 Accessories

o Product Overview

t Technical Reference

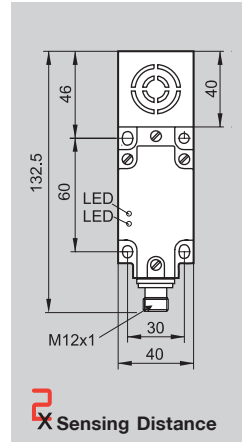
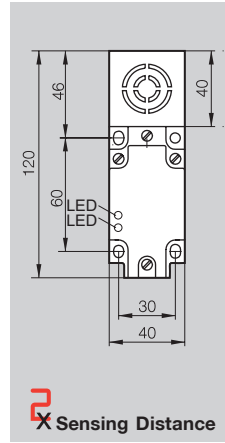
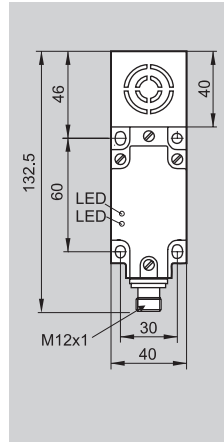
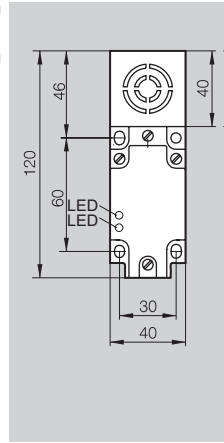
p Part Number Index

Inductive Sensors

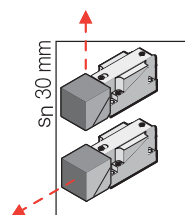
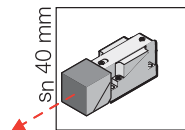
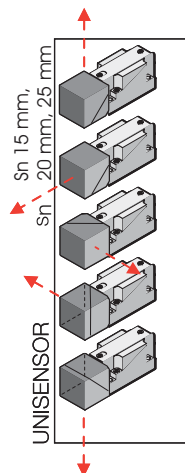
DC 3-/4-Wire
Unisensor
s_n 15 mm, 20 mm

DC 3-/4-Wire

Housing Size	40×40×120	40×40×120	40×40×120	40×40×120
Mounting	flush	flush	flush	flush
Rated Operating Distance s _n	15 mm	15 mm	20 mm	20 mm
Assured Operating Distance s _a	0...12.2 mm	0...12.2 mm	0...16.2 mm	0...16.2 mm

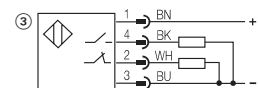


PNP	Complementary ③	BES 517-132-M3-H	BES 517-132-M3-H-S4	BES 517-132-M6-H	BES 517-132-M6-H-S4
NPN	Complementary ⑥	BES 517-134-M3-H	BES 517-134-M3-H-S4	BES 517-134-M6-H	BES 517-134-M6-H-S4
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...55 Vdc	10...55 Vdc	10...55 Vdc	10...55 Vdc	10...55 Vdc
Voltage Drop U _d at I _e	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
Rated Insulation Voltage U _i	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac
Load Current Capacity	200 mA	200 mA	200 mA	200 mA	200 mA
Current Consumption (closed/open)	≤ 20 mA/≤ 15 mA	≤ 20 mA/≤ 15 mA	≤ 20 mA/≤ 15 mA	≤ 20 mA/≤ 15 mA	≤ 20 mA/≤ 15 mA
Off-state Current I _r	≤ 80 μA	≤ 80 μA	≤ 80 μA	≤ 80 μA	≤ 80 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	100 Hz	100 Hz	50 Hz	50 Hz	50 Hz
Function/Supply Voltage Indication	yes/yes	yes/yes	yes/yes	yes/yes	yes/yes
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67	IP 67	IP 67
Housing Material	PBTP	PBTP	PBTP	PBTP	PBTP
Material of Sensing Face	PBTP	PBTP	PBTP	PBTP	PBTP
Connection	screw terminals	connector	screw terminals	connector	connector
Max. Wire Size	≤ 14 AWG		≤ 14 AWG		
Approval					
Recommended Connector		C04 AEL-00-VY-050M			C04 AEL-00-VY-050M
Mounting Variations Allowed	Fig. 1 thru 6	Fig. 1 thru 6	Fig. 1 thru 6	Fig. 1 thru 6	Fig. 1 thru 6

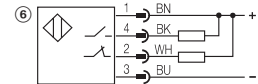


Wiring Diagrams

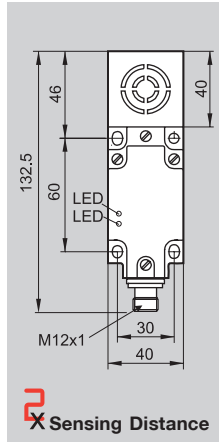
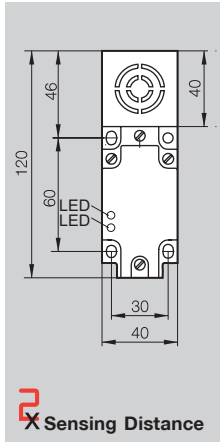
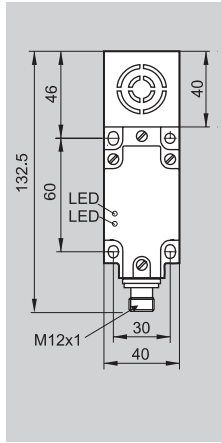
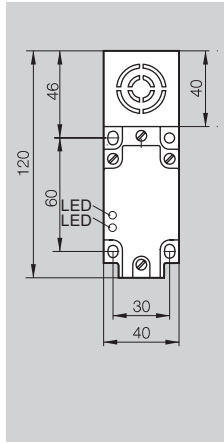
PNP N/O & N/C



NPN N/O & N/C



40x40x120 non-flush 30 mm 0...24.3 mm	40x40x120 non-flush 30 mm 0...24.3 mm	40x40x120 non-flush 40 mm 0...32.4 mm	40x40x120 non-flush 40 mm 0...32.4 mm
--	--	--	--



BES 517-132-M5-H	BES 517-132-M5-H-S4	BES 517-132-M7-H	BES 517-132-M7-H-S4
BES 517-134-M5-H	BES 517-134-M5-H-S4	BES 517-134-M7-H	BES 517-134-M7-H-S4
24 Vdc	24 Vdc	24 Vdc	24 Vdc
10...55 Vdc	10...55 Vdc	10...55 Vdc	10...55 Vdc
≤ 2.5 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
250 Vac	250 Vac	250 Vac	250 Vac
200 mA	200 mA	200 mA	200 mA
≤ 20 mA/≤ 15 mA	≤ 20 mA/≤ 15 mA	≤ 20 mA/≤ 15 mA	≤ 20 mA/≤ 15 mA
≤ 80 μA	≤ 80 μA	≤ 80 μA	≤ 80 μA
yes	yes	yes	yes
yes	yes	yes	yes
≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF
≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
60 Hz	60 Hz	50 Hz	50 Hz
yes/yes	yes/yes	yes/yes	yes/yes
IP 67	IP 67	IP 67	IP 67
PBTP	PBTP	PBTP	PBTP
PBTP	PBTP	PBTP	PBTP
screw terminals	connector	screw terminals	connector
≤ 14 AWG		≤ 14 AWG	
	C04 AEL-00-VY-050M		C04 AEL-00-VY-050M
Fig. 4 thru 6	Fig. 4 thru 6	Fig. 4 and 6	Fig. 4 and 6

Mounting Variations

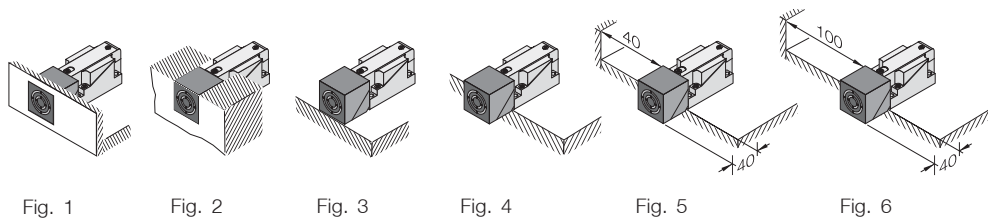


Fig. 1

Fig. 2

Fig. 3

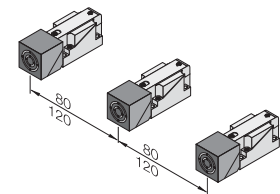
Fig. 4

Fig. 5

Fig. 6

Row Mounting

flush 80 mm
non-flush 120 mm

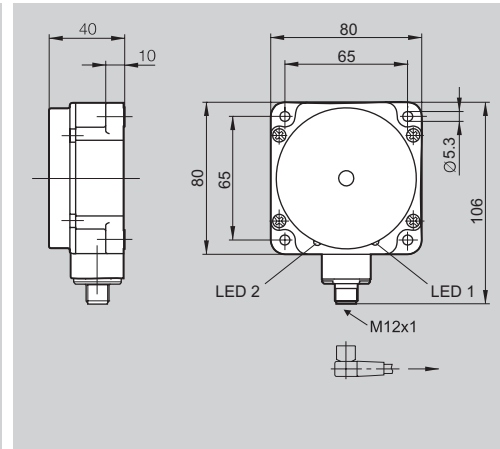
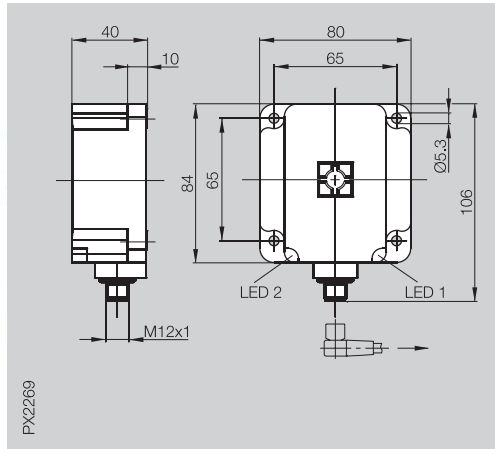


Inductive Sensors

DC 3-/4-Wire
Maxisensor
s_n 40 mm, 50 mm

DC 3-/4-Wire

Housing Size	80×80×40	80×80×40	80×80×40
Mounting	flush	non-flush	non-flush
Rated Operating Distance s _n	40 mm	50 mm	50 mm
Assured Operating Distance s _a	0...32.4 mm	0...40.5 mm	0...40.5 mm



PNP	Normally-open ①	BES Q80KA-PSH40B-S04Q	BES Q80KA-PSH50B-S04Q	
	Complementary ③	BES Q80KA-PAH40B-S04Q	BES Q80KA-PAH50B-S04Q	
NPN	Complementary ⑥			BES 517-140-M5-H-S4
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...55 Vdc	10...55 Vdc	10...55 Vdc	10...55 Vdc
Voltage Drop U _d at I _e	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
Rated Insulation Voltage U _i	250 Vac	250 Vac	250 Vac	250 Vac
Load Current Capacity	200 mA	200 mA	200 mA	200 mA
Current Consumption (closed/open)	≤ 15 mA	≤ 15 mA	≤ 15 mA	≤ 15 mA/≤ 15 mA
Off-state Current I _l				≤ 80 µA
Protected Against Polarity Reversal	yes	yes	yes	yes
Short Circuit Protected	yes	yes	yes	yes
Load Capacity				≤ 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	50 Hz	50 Hz	50 Hz	100 Hz
Function/Supply Voltage Indication	yes/yes	yes/yes	yes/yes	yes/yes
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67	IP 67
Housing Material	PBT	PBT	PBT	PBTP
Material of Sensing Face	PBT	PBT	PBT	PBTP
Connection	connector	connector	connector	connector
Recommended Connector	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M
Mounting Variations Allowed	Fig. 1 thru 3	Fig. 1 thru 3	Fig. 1 thru 3	Fig. 4

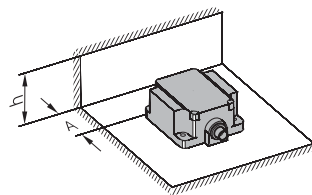


Fig. 1

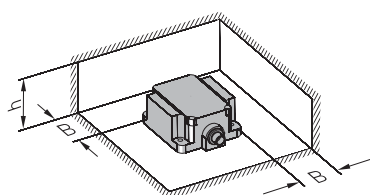


Fig. 2

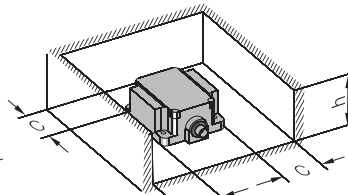


Fig. 3

Mounting in steel/non-ferrous metals

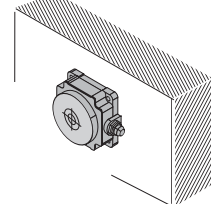


Fig. 4

Minimum Clearance for Steel

h	A	B	C
40	70	80	90
70	80	90	100

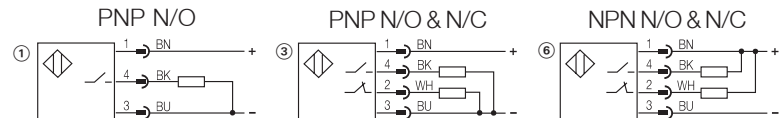
units in mm

Minimum Clearance for Aluminum

h	A	B	C
40	0	10	10
70	10	20	20

units in mm

Wiring Diagrams



AC 2-Wire

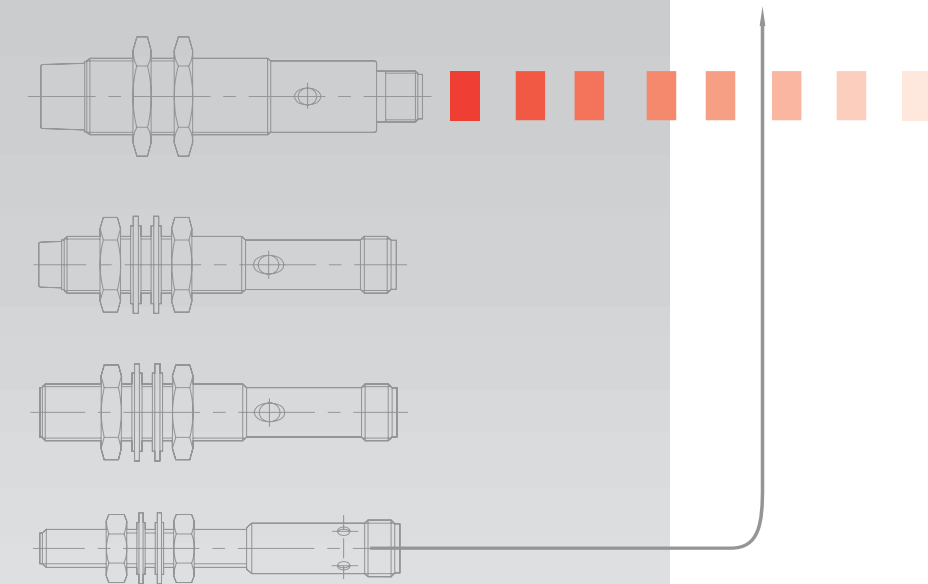
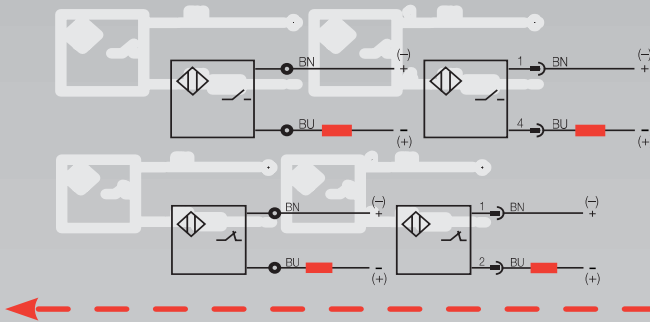
Inductive Sensors

AC 2-Wire Tubular Sensors Contents

AC 2-Wire Tubular Sensors

Balluff's 2-wire AC tubular product line includes sensors that range in size from M12 to M30 to meet a wide variety of applications. These sensors are available with various connection options including pre-wired cable out and integrated micro connector.

- 1.110** AC 2-Wire M12
- 1.111** AC 2-Wire M18, M30
- 1.111** AC 2-Wire M30



Inductive

1

Contents
Selection Charts
Part Numbers

Featured

- GlobalProx®
 - DC 3-Wire
 - DC 2-Wire
- SteelFace®
 - 2x
 - 3x
 - Fe/NFe
- Welding
 - Factor 1
 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories

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
- DC 2-Wire Block

Specialty

- SuperShorties™
- Proxinox®
- High Temp
- Analog
- Large Housing
- Ring Sensor

6 Connectors

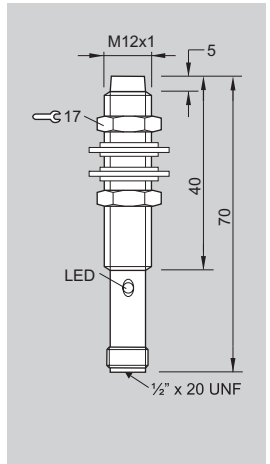
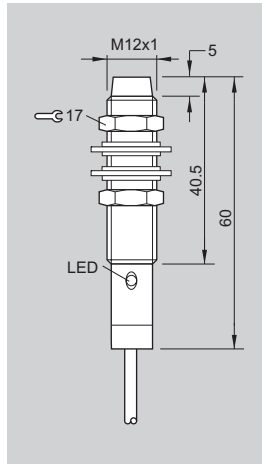
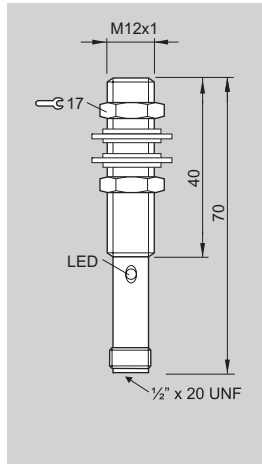
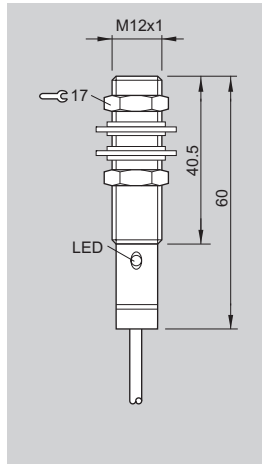
7 Accessories

o Product Overview

t Technical Reference

p Part Number Index

Housing Size	M12x1	M12x1	M12x1	M12x1
Mounting	flush	flush	non-flush	non-flush
Rated Operating Distance s _n	2 mm	2 mm	4 mm	4 mm
Assured Operating Distance s _a	0...1.6 mm	0...1.6 mm	0...3.2 mm	0...3.2 mm

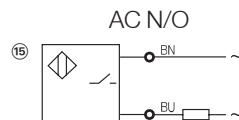


AC	Normally-open ¹⁶ / ₁₇	BES 516-449-BO-L-05	BES 516-449-S21-L	BES 516-461-BO-L-05	BES 516-461-S21-L
Rated Operational Voltage U _e		110 AC	110 AC	110 AC	110 AC
Supply Voltage U _B		20...250 Vac	20...250 Vac	20...250 Vac	20...250 Vac
Voltage Drop U _d at I _e		≤ 4.0 V	≤ 4.0 V	≤ 4.0 V	≤ 4.0 V
Rated Insulation Voltage U _i		250 Vac	250 Vac	250 Vac	250 Vac
Rated Operational Current I _e		500 mA	500 mA	500 mA	500 mA
Minimum Operational Current I _m		5 mA	5 mA	5 mA	5 mA
Off-state Current I _r		1.6 mA	1.5 mA	1.5 mA	1.5 mA
Inrush Current I _K t=20ms		2 A/max. 1.0 Hz	2 A/max. 1.0 Hz	2 A/max. 1.0 Hz	2 A/max. 1.0 Hz
Protected Against Polarity Reversal		yes	yes	yes	yes
Short Circuit Protected		no	no	no	no
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		25 Hz	25 Hz	25 Hz	25 Hz
Function Indication		yes	yes	yes	yes
Degree of Protection per IEC 60529		IP 67	IP 67	IP 67	IP 67
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	cable	connector
No. of Wires x Gauge		2 x 22 AWG		2 x 22 AWG	
Approvals		cULus	cULus	cULus	cULus
Recommended Connector			C21 AE3-00-VY-150F		C21 AE3-00-VY-150F

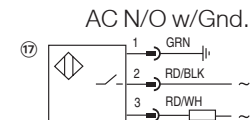
Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

Wiring Diagrams

Cable version



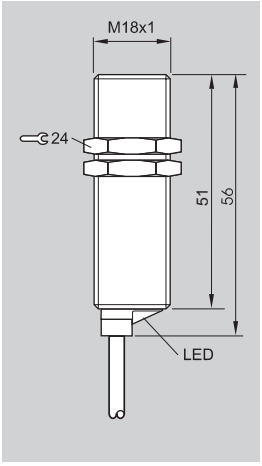
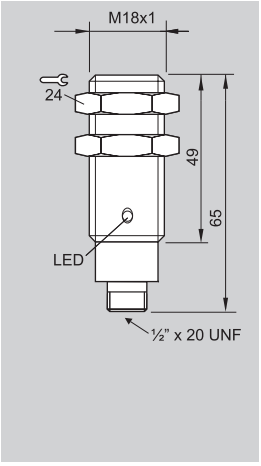
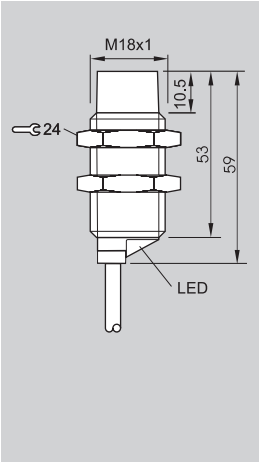
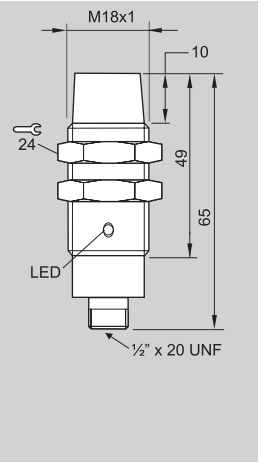
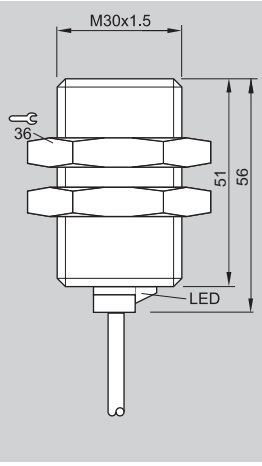
Connector version



AC 2-Wire

Inductive Sensors

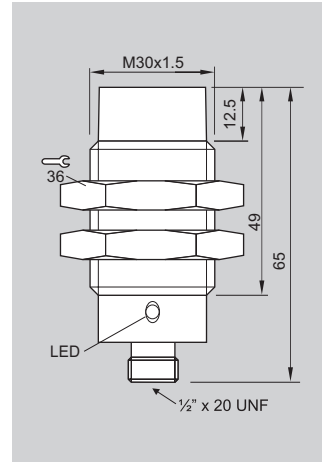
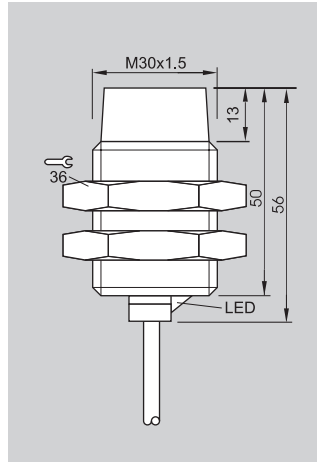
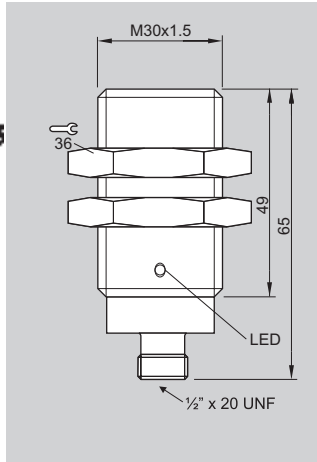
AC 2-Wire
M18, M30
S_n 5, 8, 10 mm

M18x1 flush 5 mm 0...4.0 mm	M18x1 flush 5 mm 0...4.0 mm	M18x1 non-flush 8 mm 0...6.4 mm	M18x1 non-flush 8 mm 0...6.4 mm	M30x1 flush 10 mm 0...8.0 mm
				
BES 516-420-E4-L-05	BES 516-420-E5-L-S21	BES 516-437-E4-L-05	BES 516-437-E5-L-S21	BES 516-418-E4-L-05
110 AC	110 AC	110 AC	110 AC	110 AC
20...250 Vac	20...250 Vac	20...250 Vac	20...250 Vac	20...250 Vac
≤ 4.0 V	≤ 4.0 V	≤ 4.0 V	≤ 4.0 V	≤ 4.0 V
250 Vac	250 Vac	250 Vac	250 Vac	250 Vac
500 mA	500 mA	500 mA	500 mA	500 mA
5 mA	5 mA	5 mA	5 mA	5 mA
1.5 mA	1.5 mA	1.5 mA	1.5 mA	1.5 mA
2 A/max. 1.0 Hz	2 A/max. 1.0 Hz	2 A/max. 1.0 Hz	2 A/max. 1.0 Hz	2 A/max. 1.0 Hz
yes	yes	yes	yes	yes
no	no	no	no	no
≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
25 Hz	25 Hz	25 Hz	25 Hz	10 Hz
yes	yes	yes	yes	yes
IP 67	IP 67	IP 67	IP 67	IP 67
nickel plated brass	nickel plated brass	nickel plated brass	nickel plated brass	nickel plated brass
PA 12	PA 12	PA 12	PA 12	PA 12
cable	connector	cable	connector	cable
2 x 22 AWG		2 x 22 AWG		2 x 22 AWG
cULus	cULus	cULus	cULus	cULus
	C21 AE3-00-VY-150F		C21 AE3-00-VY-150F	



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

Housing Size	M30x1	M30x1	M30x1
Mounting	flush	non-flush	non-flush
Rated Operating Distance s _n	10 mm	15 mm	15 mm
Assured Operating Distance s _a	0...8.0 mm	0...12.0 mm	0...12.0 mm

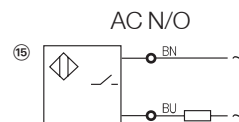


AC	Normally-open ¹⁶ / ₁₇	BES 516-418-E5-L-S21	BES 516-432-E4-L-05	BES 516-432-E5-L-S21
Rated Operational Voltage U _e		110 AC	110 AC	110 AC
Supply Voltage U _B		20...250 Vac	20...250 Vac	20...250 Vac
Voltage Drop U _d at I _e		≤ 4.0 V	≤ 4.0 V	≤ 4.0 V
Rated Insulation Voltage U _i		250 Vac	250 Vac	250 Vac
Rated Operational Current I _e		500 mA	500 mA	500 mA
Minimum Operational Current I _M		5 mA	5 mA	5 mA
Off-state Current I _r		1.5 mA	1.5 mA	1.5 mA
Inrush Current I _K t=20ms		2 A/max. 1.0 Hz	2 A/max. 1.0 Hz	2 A/max. 1.0 Hz
Protected Against Polarity Reversal		yes	yes	yes
Short Circuit Protected		no	no	no
Repeat Accuracy R		≤ 5 %	≤ 5 %	≤ 5 %
Ambient Temperature Range T _a		-25...+70 °C	-25...+70 °C	-25...+70 °C
Operating Frequency f		25	10	25
Function Indication		yes	yes	yes
Degree of Protection per IEC 60529		IP 67	IP 67	IP 67
Housing Material		nickel plated 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 x 22 AWG	
Approvals		cULus	cULus	cULus
Recommended Connector		C21 AE3-00-VY-150F		C21 AE3-00-VY-150F

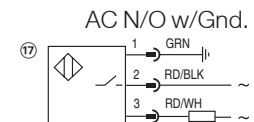


Wiring Diagrams

Cable version

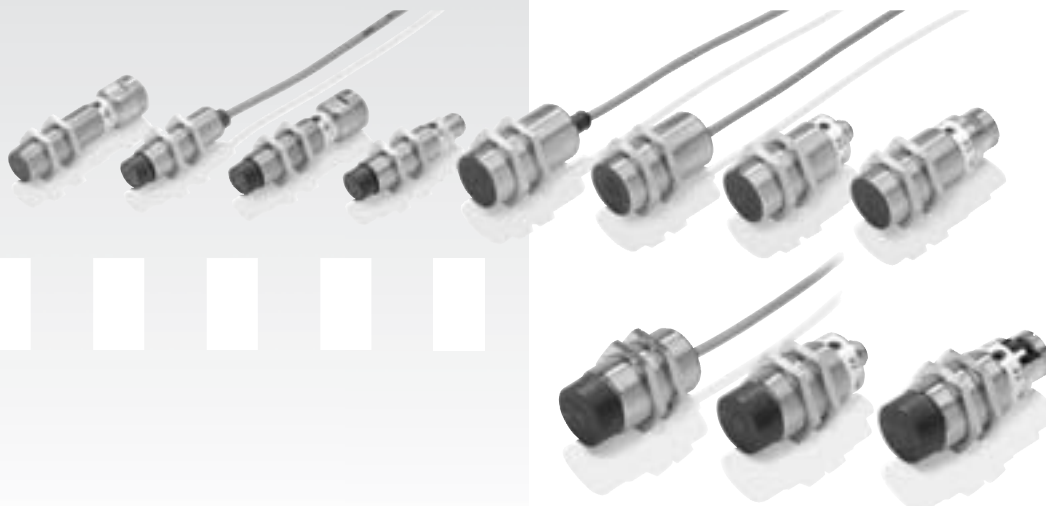
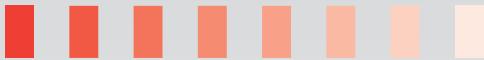
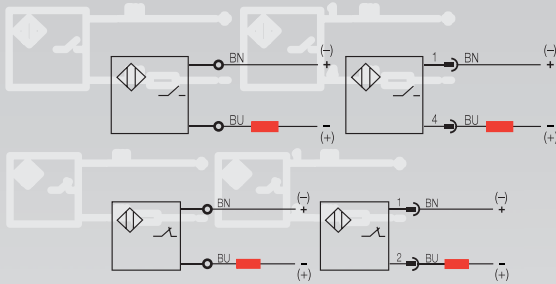
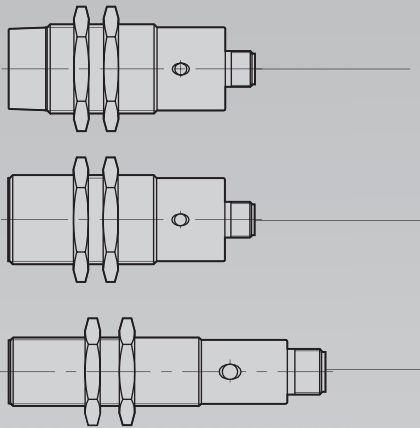


Connector version



Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

AC/DC 2-Wire



Inductive Sensors

AC/DC 2-Wire Tubular Sensors Contents

AC/DC 2-Wire Tubular Sensors

Balluff's 2-wire AC/DC tubular product line includes sensors that range in size from M12 to M30 to meet a wide variety of applications. These sensors are available with various connection options including pre-wired cable out and integrated micro connector.

- 1.114** AC/DC 2-Wire M12
- 1.115** AC/DC 2-Wire M18
- 1.118** AC/DC 2-Wire M30

Inductive

1

- Contents
- Selection Charts
- Part Numbers
- Featured
 - GlobalProx®
 - DC 3-Wire
 - DC 2-Wire
 - SteelFace®
 - 2x
 - 3x
 - Fe/NFe
 - Welding
 - Factor 1
 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories

- 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
 - DC 2-Wire Block

- Specialty
 - SuperShorties™
 - Proxinox®
 - High Temp
 - Analog
 - Large Housing
 - Ring Sensor

6 Connectors

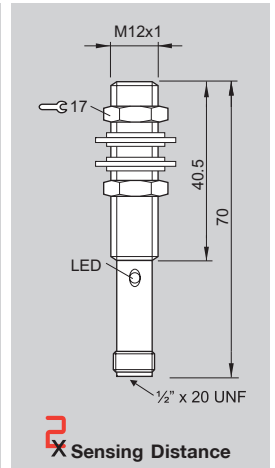
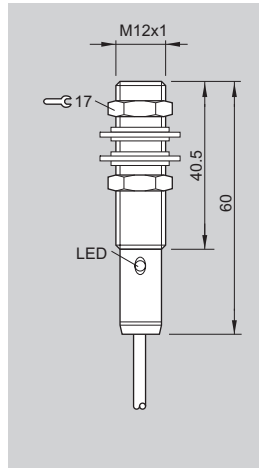
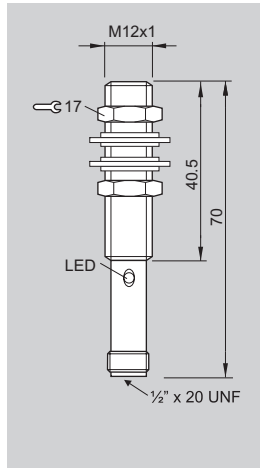
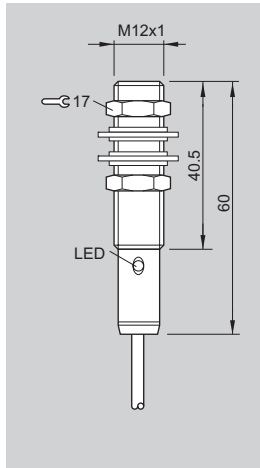
7 Accessories

o Product Overview

t Technical Reference

p Part Number Index

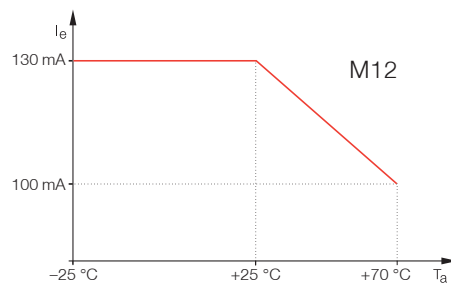
Housing Size	M12x1	M12x1	M12x1	M12x1
Mounting	flush	flush	flush	flush*
Rated Operating Distance s _n	2 mm	2 mm	4 mm	4 mm
Assured Operating Distance s _a	0...1.6 mm	0...1.6 mm	0...3.2 mm	0...3.2 mm



AC/DC	Normally-open ⑯ ⑰	BES 516-207-B0-E-03	BES 516-207-S21-E	BES 516-207-G-BO-E-03	BES 516-207-G-S21-E
AC/DC	Normally-closed ⑱ ⑲	BES 516-208-B0-E-03	BES 516-208-S21-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	≤ 500 Hz	≤ 500 Hz	≤ 500 Hz
Function Indication	yes	yes	yes	yes	yes
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67	IP 67	IP 67
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	cable	cable	connector
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			C21 AE3-00-VY-150F

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

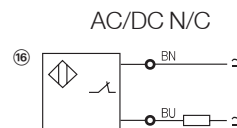
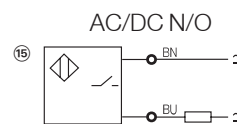
Rated operational current must be derated for temperature



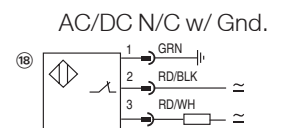
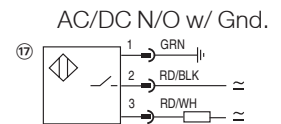
Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

Wiring Diagrams

Cable version



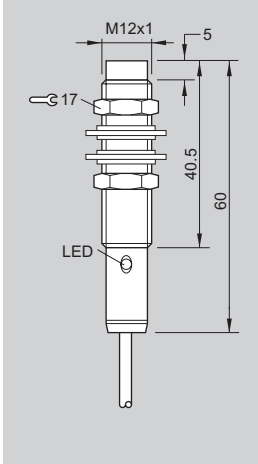
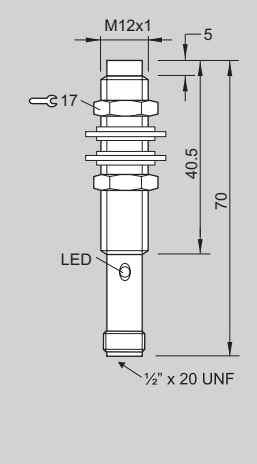
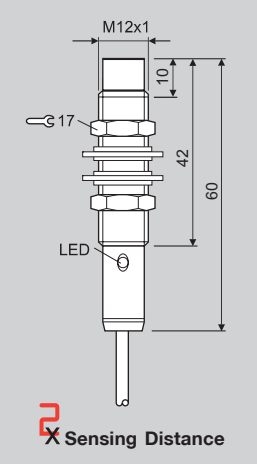
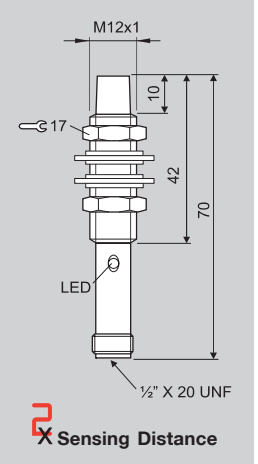
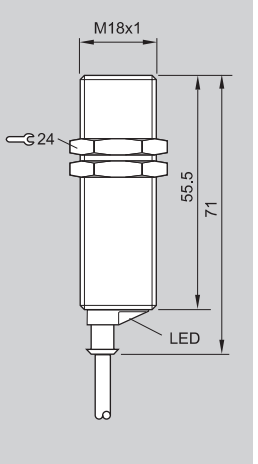
Connector version



AC/DC 2-Wire

Inductive Sensors

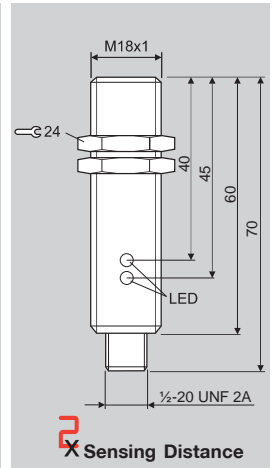
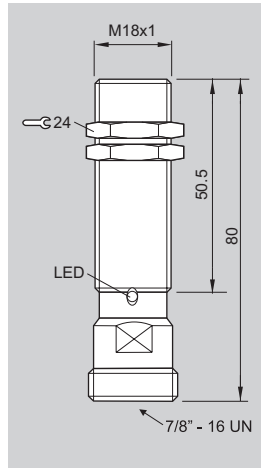
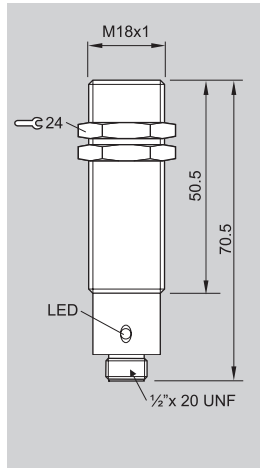
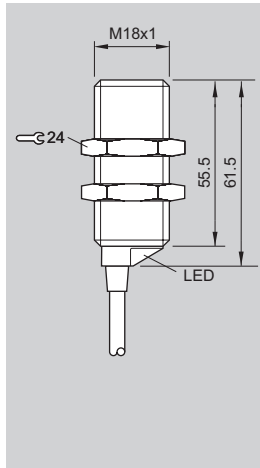
AC/DC 2-Wire
M12, M18
S_n 4, 5, 8 mm

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
				
BES 516-209-B0-E-03 BES 516-210-B0-E-03	BES 516-209-S21-E BES 516-210-S21-E	BES 516-209-G-BO-E-03	BES 516-209-G-S21-E	BES 516-211-E6-E-05
110 Vac 20...250 Vdc/Vac ≤ 11 V; ≤ 7.5 V dyn.	110 Vac 20...250 Vdc/Vac ≤ 11 V; ≤ 7.5 V dyn.	110 Vac 20...250 Vdc/Vac ≤ 11.07 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 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
yes	yes	yes	yes	yes
IP 67	IP 67	IP 67	IP 67	IP 67
stainless steel	stainless steel	stainless steel	stainless steel	nickel plated brass
PA 12	PA 12	PBTP	PBTP	PA 12
cable	connector	cable	connector	cable
2 x 22 AWG		2x22 AWG		2 x 22 AWG
cULus	cULus	cULus	cULus	cULus
	C21 AE3-00-VY-150F		C21 AE3-00-VY-150F	



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

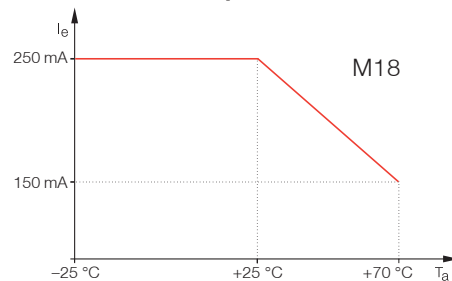
Housing Size	M18x1	M18x1	M18x1	M18x1
Mounting	flush	flush	flush	flush*
Rated Operating Distance s _n	5 mm	5 mm	5 mm	8 mm
Assured Operating Distance s _a	0...4 mm	0...4 mm	0...4 mm	0...6.4 mm



AC/DC	Normally-open (16) (17)	BES 516-211-E4-E-03	BES 516-211-E5-E-S21	BES 516-211-E5-E-S5	BES M18MN-USU80B-S21G
AC/DC	Normally-closed (16) (18)	BES 516-212-E4-E-03	BES 516-212-E5-E-S21	BES 516-212-E5-E-S5	
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	≤ 300 Hz
Function Indication	yes	yes	yes	yes	yes
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67	IP 67	IP 67
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	connector
No. of Wires x Gauge	2 x 22 AWG				
Approvals	cULus	cULus	cULus	cULus	cULus
Recommended Connector		C21 AE3-00-VY-150F	C05 AE1-00-VY-150F	C21 AE3-00-VY-150F	

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

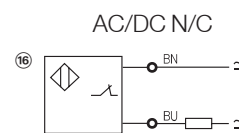
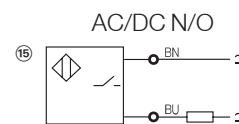
Rated operational current must be derated for temperature



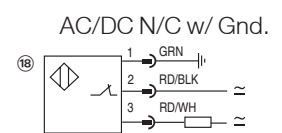
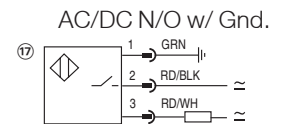
Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

Wiring Diagrams

Cable version



Connector version



AC/DC 2-Wire

Inductive Sensors

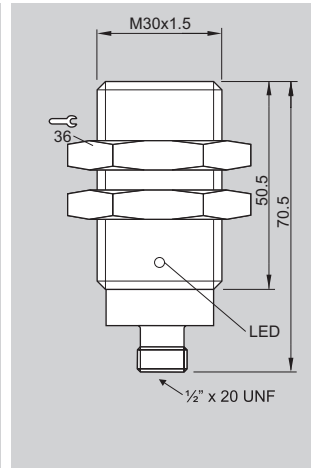
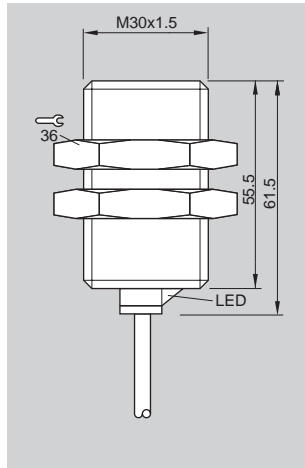
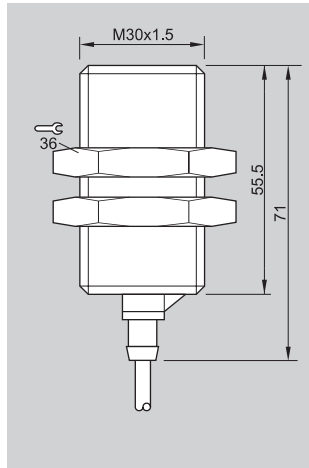
AC/DC 2-Wire
M18, M30
S_n 8, 16 mm

M18x1 non-flush 8 mm 0...6.4 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
BES 516-213-E4-E-03 BES 516-214-E4-E-03	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-03	BES 516-213-G-E5-E-S21
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	250 Vac 250 mA 5 mA	250 Vac 250 mA 5 mA	250 Vac 250 mA ≤ 5 mA	250 Vac 250 mA ≤ 5 mA
≤ 1.7 mA at 110 Vac 1.5 A/max. 1 Hz	≤ 1.7 mA at 110 Vac 1.5 A/max. 1 Hz	≤ 1.7 mA at 110 Vac 1.5 A/max. 1 Hz	≤ 1.7 mA at 110 Vac 1.5 A/max. 1.0 Hz	≤ 1.7 mA at 110 Vac 1.5 A/max. 1.0 Hz
yes yes	yes yes	yes yes	yes yes	yes yes
≤ 5 % -25...+70 °C ≤ 250 Hz	≤ 5 % -25...+70 °C ≤ 250 Hz	≤ 5 % -25...+70 °C ≤ 250 Hz	≤ 5 % -25...+70 °C ≤ 100 Hz	≤ 5 % -25...+70 °C ≤ 100 Hz
yes IP 67 nickel plated brass	yes IP 67 nickel plated brass	yes IP 67 nickel plated brass	yes IP 67 nickel plated brass	yes IP 67 nickel plated brass
PA 12 cable 2 x 22 AWG cULus	PA 12 connector cULus	PA 12 connector cULus	PBTP cable 2 x 22 AWG cULus	PBTP connector cULus
	C05 AE1-00-VY-150F	C21 AE3-00-VY-150F		C21 AE3-00-VY-150F



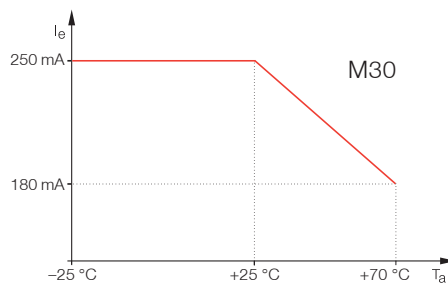
- For mounting brackets & accessories see section 7.
- For mating connectors see section 6.

Housing Size	M30×1.5	M30×1.5	M30×1.5
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-E6-E-05	BES 516-215-E4-E-03	BES 516-215-E5-E-S21
AC/DC	Normally-closed ⑯ ⑱		BES 516-216-E4-E-03	BES 516-216-E5-E-S21
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	3 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
Function Indication	yes	yes	yes	yes
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67	IP 67
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	cable	connector	connector
No. of Wires×Gauge	2 × 22 AWG	2 × 22 AWG		
Approvals	cULus	cULus		cULus
Recommended Connector				C21 AE3-00-VY-150F

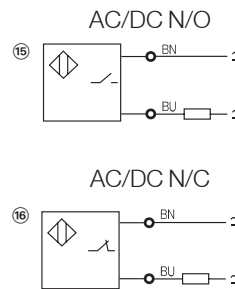
Rated operational current must be derated for temperature



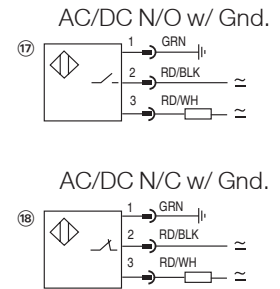
Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

Wiring Diagrams

Cable version



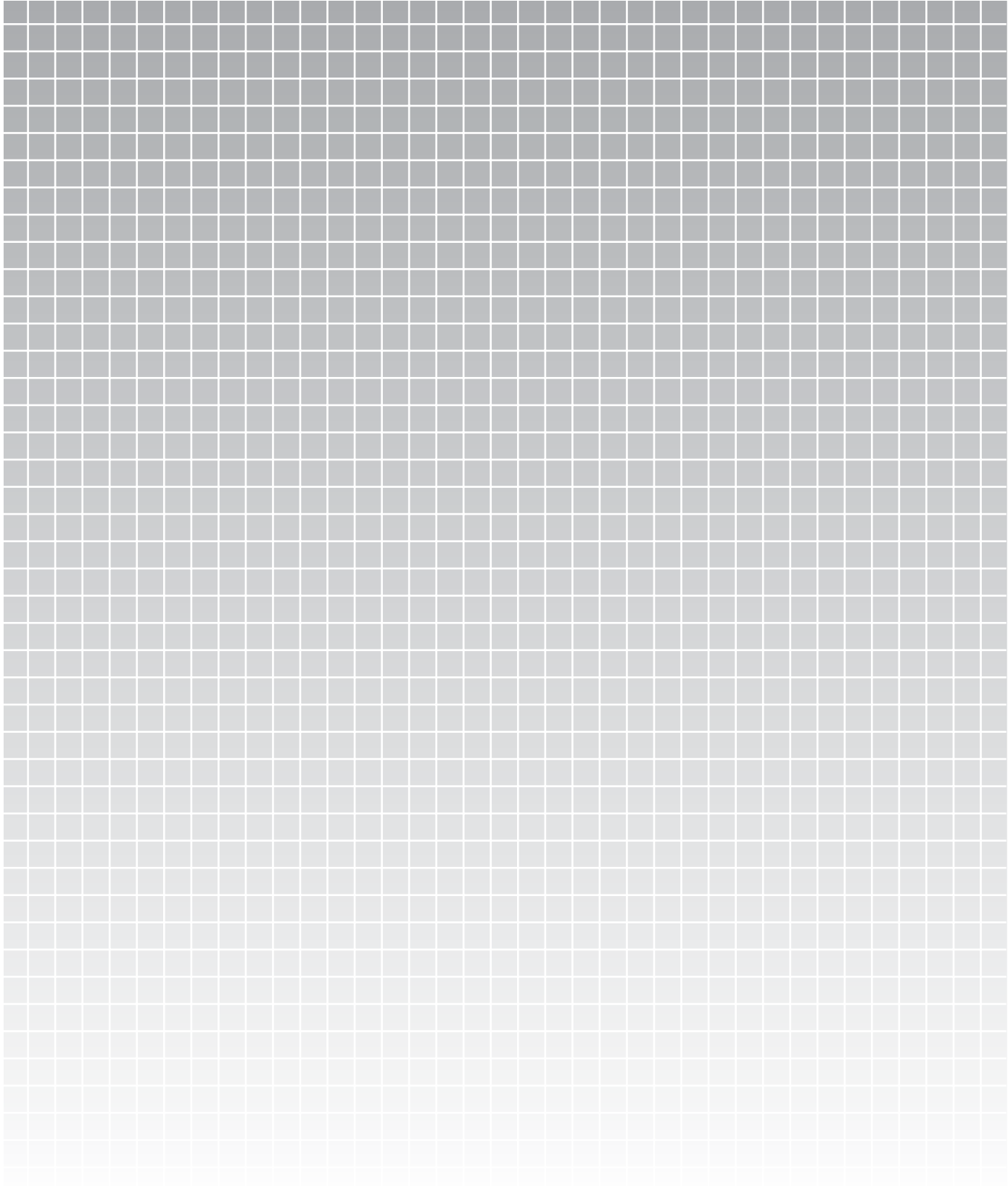
Connector version



M30x1.5 flush 10 mm 0...8.1 mm	M30x1.5 non-flush 15 mm 0...12.1 mm	M30x1.5 non-flush 15 mm 0...12.1 mm	M30x1.5 non-flush 15 mm 0...12.1 mm
BES 516-215-E5-E-S5 BES 516-216-E5-E-S5	BES 516-217-E4-E-03 BES 516-218-E4-E-03	BES 516-217-E5-E-S21 BES 516-218-E5-E-S21	BES 516-217-E5-E-S5 BES 516-218-E5-E-S5
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 2 A/max. 1 Hz yes yes	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	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	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 2 A/max. 1 Hz yes yes
≤ 10 % -25...+70 °C ≤ 150 Hz yes IP 67 nickel plated brass PA 12 connector cULus C05 AE1-00-VY-150F	≤ 10 % -25...+70 °C ≤ 100 Hz yes IP 67 nickel plated brass PA 12 cable 2 × 22 AWG cULus	≤ 10 % -25...+70 °C ≤ 100 Hz yes IP 67 nickel plated brass PA 12 connector cULus C21 AE3-00-VY-150F	≤ 10 % -25...+70 °C ≤ 100 Hz yes IP 67 nickel plated brass PA 12 connector cULus C05 AE1-00-VY-150F



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



AC/DC 2-Wire

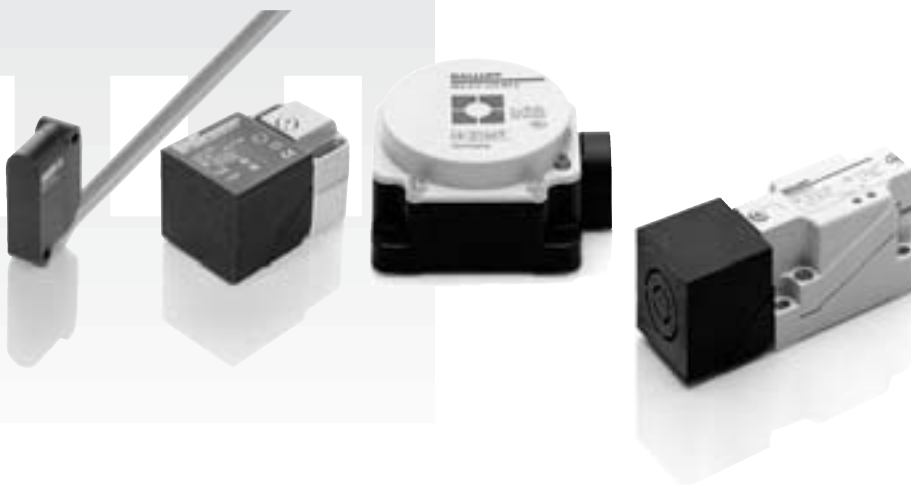
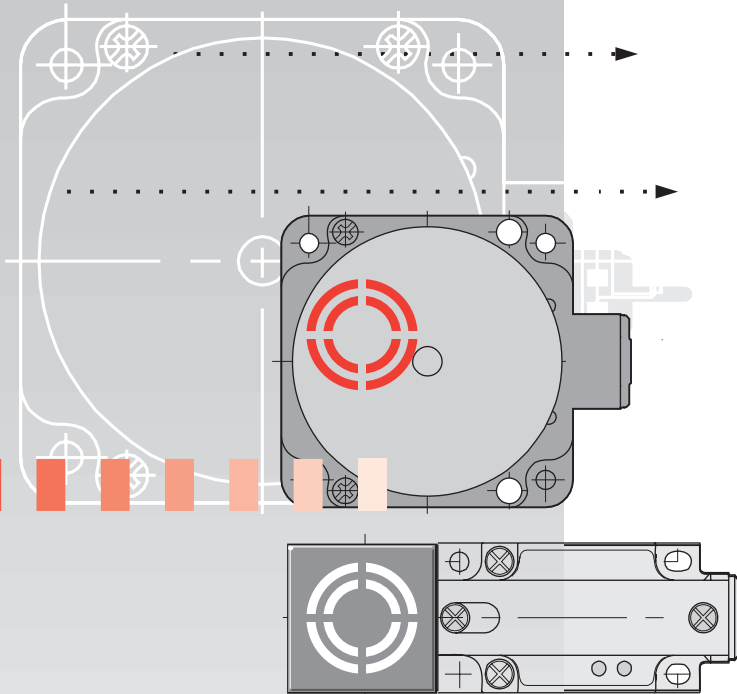
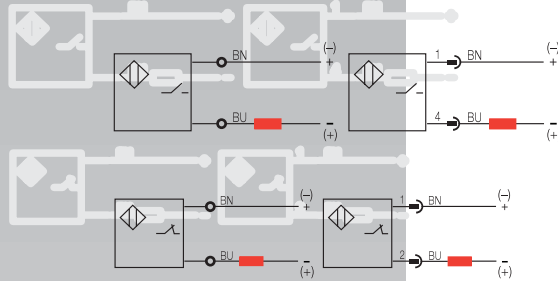
Inductive Sensors

AC/DC 2-Wire Block Sensors Contents

AC/DC 2-Wire Block Sensors

Balluff 2-wire AC/DC block style sensors offer long range performance for line-level voltage applications. With a voltage range of 20-250 volts AC/DC on most models, these sensors can be used with a wide variety of power sources.

- 1.122** AC/DC 2-Wire Midisensor, Unicompat
- 1.123** AC/DC 2-Wire Unisensor
- 1.124** AC/DC 2-Wire Maxisensor



Inductive

1

- Contents
- Selection Charts
- Part Numbers
- Featured
 - GlobalProx®
 - DC 3-Wire
 - DC 2-Wire
 - SteelFace®
 - 2x
 - 3x
 - Fe/NFe
 - Welding
 - Factor 1
 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories

- 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
 - DC 2-Wire Block

- Specialty
 - SuperShorties™
 - Proxinox®
 - High Temp
 - Analog
 - Large Housing
 - Ring Sensor

6 Connectors

7 Accessories

o Product Overview

t Technical Reference

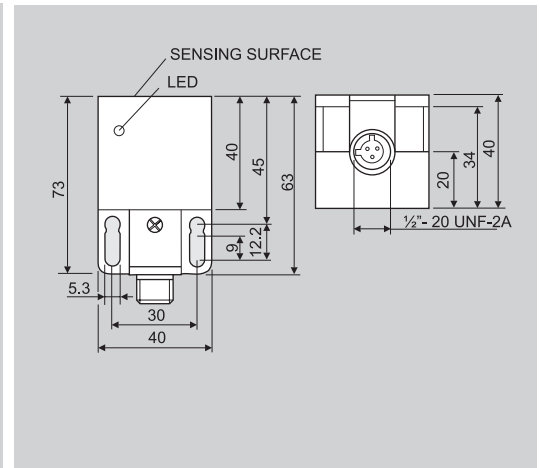
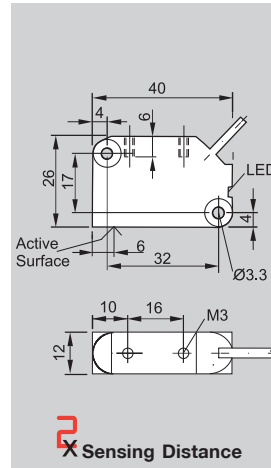
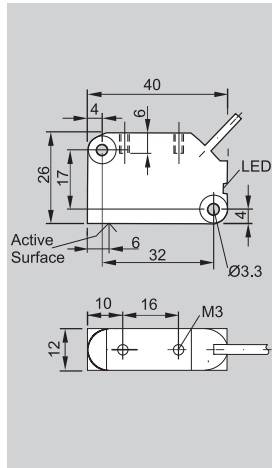
p Part Number Index

Inductive Sensors

AC/DC 2-Wire
Midisensor, Unicomcompact
S_n 2, 4, 15, 20, 25 mm

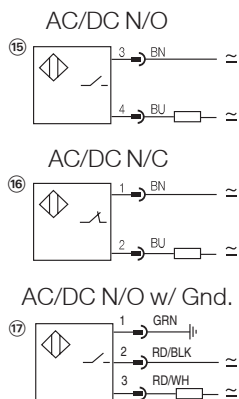
AC/DC 2-Wire

Housing Size	26×40×12	26×40×12	40×40×73	40×40×73
Mounting	flush	flush	flush	non-flush
Rated Operating Distance s _n	2 mm	4 mm	15 mm	selectable 20/25 mm
Assured Operating Distance s _a	0...3.2 mm	0...3.2 mm	0...12.2 mm	0...16.2/20.3 mm

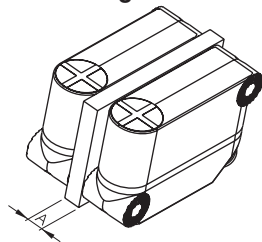


AC/DC	Normally-open ⑰	BES R05KB-USU20B-EV03	BES R05KB-USU40B-EV03	BES Q40KEU-USU15B-S21G	BES Q40KEU-USU25F-S21G
AC/DC	NO/NC selectable ⑱ ⑲				
Rated Operational Voltage U _e	110 Vac	110 Vac	110 Vac	110 Vac	110 Vac
Supply Voltage U _B	20...250 Vac/dc	20...250 Vac/dc	20...250 Vac/dc	20...250 Vac/dc	20...250 Vac/dc
Voltage Drop U _d at I _e	≤ 12 V; ≤ 8.5 V dyn.	≤ 12 V; ≤ 8.5 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	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	≤ 0.7 A/≤ 0.5 Hz	≤ 0.7 A/≤ 0.5 Hz	≤ 2 A/≤ 1 Hz	≤ 2 A/≤ 1 Hz	≤ 2 A/≤ 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	400 Hz	400 Hz	100 Hz	100 Hz	100 Hz
Function/Supply Voltage Indication	yes/no	yes/no	yes/no	yes/no	yes/no
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67	IP 67	IP 67
Housing Material	PA 12	PA 12	PBT/GD-ZnAl	PBT/GD-ZnAl	PBT/GD-ZnAl
Material of Sensing Face	PA 12	PA 12	PBT	PBT	PBT
Connection	cable	cable	connector	connector	connector
Max Wire Size	2 x 22 AWG	2 x 22 AWG			
Approvals					
Mounting Variations Allowed			Fig. 1 thru 6	Fig. 3 thru 6**	
Recommended Connector			C21 AE3-00-VY-150F	C21 AE3-00-VY-150F	

Wiring Diagrams

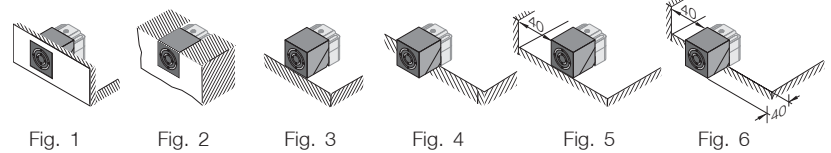


Midisensor Mounting



- if non-metal, distance A should be at least 5 mm
- if metal, distance A should be at least 4 mm

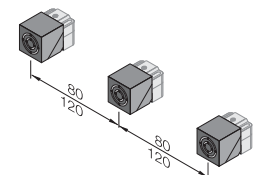
Unicomcompact Mounting Variations



** Sn 20 mm Fig. 4 and 6
Sn 25 mm Fig. 3 and 5

Row Mounting

flush 80 mm
non-flush 120 mm

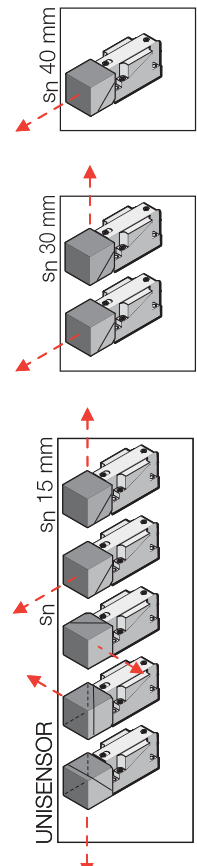


AC/DC 2-Wire

Inductive Sensors

AC/DC 2-Wire
Unisensor
S_n 15, 20, 25, 30, 40 mm

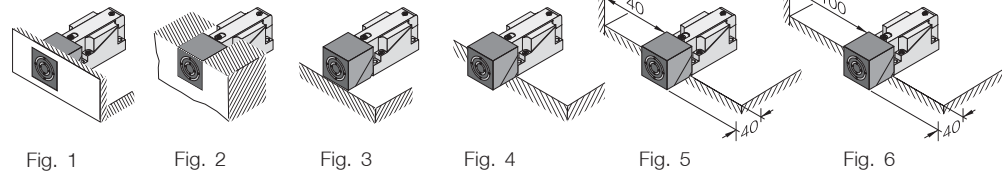
40x40x120 flush 15 mm 0...12.2 mm	40x40x120 non-flush selectable 20/25 mm 0...16.2 mm, 0...20.3 mm	40x40x120 non-flush 30 mm 0...24.3 mm	40x40x120 non-flush 40 mm 0...32.4 mm
BES 517-223-*3-E	BES 517-223-*4-E	BES 517-223-*5-E	BES 517-223-*7-EL
110 Vac 20...250 Vac/dc ≤ 11.5 V; ≤ 7.5 V dyn.	110 Vac 20...250 Vac/dc ≤ 11.5 V; ≤ 7.5 V dyn.	110 Vac 20...250 Vac/dc ≤ 11.5 V; ≤ 7.5 V dyn.	110 Vac 20...250 Vac/dc ≤ 13.0 V; ≤ 9.0 V dyn.
250 Vac 250 mA 5 mA	250 Vac 250 mA 5 mA	250 Vac 250 mA 5 mA	250 Vac 250 mA 5 mA
≤ 1.7 mA at 110 Vac 1 A/max. 1 Hz	≤ 1.7 mA at 110 Vac 1 A/max. 1 Hz	≤ 1.7 mA at 110 Vac 1 A/max. 1 Hz	≤ 1.7 mA at 110 Vac 1 A/max. 1 Hz
yes yes	yes yes	yes yes	yes yes
≤ 5 % -25...+70 °C ≤ 100 Hz	≤ 5 % -25...+70 °C ≤ 100 Hz	≤ 5 % -25...+70 °C ≤ 100 Hz	≤ 5 % -25...+70 °C ≤ 100 Hz
yes/no IP 67 PBTP PBTP	yes/no IP 67 PBTP PBTP	yes/no IP 67 PBTP PBTP	yes/yes IP 67 PBTP PBTP
screw terminals ≤ 14 AWG cULus Fig. 1 thru 6	screw terminals ≤ 14 AWG cULus Fig. 3 thru 6**	screw terminals ≤ 14 AWG cULus Fig. 4 and 5	screw terminals ≤ 14 AWG cULus Fig. 4 and 6



***Specify**
U - Metal base with 1/2" NPT threads

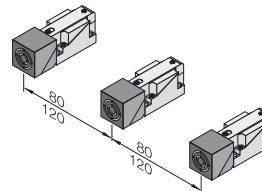
M - Plastic base with metric threads

Unisensor Mounting Variations



Sn 20 mm Fig. 4 and 6
Sn 25 mm Fig. 3 and 5

Row Mounting
flush 80 mm
non-flush 120 mm



Inductive

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- Contents
- Selection Charts
- Part Numbers
- Featured
- GlobalProx®
- DC 3-Wire
- DC 2-Wire
- SteelFace®
- 2x
- 3x
- Fe/NFe
- Welding
- Factor 1
- Weld Field Immune
- SlagMaster®
- Welding Accessories

- 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
- DC 2-Wire Block
- Specialty
- SuperShorties™
- Proxinox®
- High Temp
- Analog
- Large Housing
- Ring Sensor

6 Connectors

7 Accessories

o Product Overview

t Technical Reference

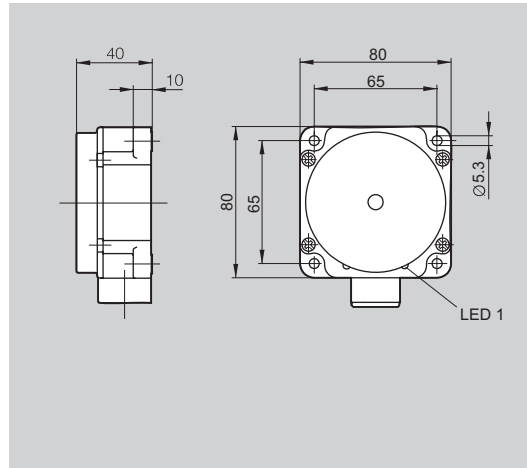
p Part Number Index

Inductive Sensors

AC/DC 2-Wire
Maxisensor
S_n 40 mm, 50 mm

AC/DC 2-Wire

Housing Size	80×80×40	80×80×40
Mounting	non-flush	non-flush
Rated Operating Distance s _n	40 mm	50 mm
Assured Operating Distance s _a	0...32.4 mm	0...40.5 mm



AC/DC NO/NC selectable ⁽¹⁶⁾ ⁽¹⁶⁾	BES 517-224-M4-E	BES 517-224-*5-E
Rated Operational Voltage U _e	110 Vac	110 Vac
Supply Voltage U _B	20...250 Vac/Vdc	20...250 Vac/dc
Voltage Drop U _d at I _e	≤ 11.0 V; ≤ 7.5 V dyn.	≤ 11.0 V; ≤ 7.5 V dyn.
Rated Insulation Voltage U _i	250 Vac	250 Vac
Rated Operational Current I _e	250 mA	250 mA
Minimum Operational Current I _m	5 mA	5 mA
Off-state Current I _r	≤ 1.7 mA at 110 Vac	≤ 1.7 mA at 110 Vac
Inrush Current I _k t ≤ 20 ms	≤ 1 A/≤ 1 Hz	1 A/max. 1 Hz
Protected Against Polarity Reversal	yes	yes
Short Circuit Protected	yes	yes
Repeat Accuracy R	≤ 5 %	≤ 5 %
Ambient Temperature Range T _a	-25...+70 °C	-25...+70 °C
Operating Frequency f	≤ 10 Hz	≤ 10 Hz
Function/Supply Voltage Indication	yes/no	yes/no
Degree of Protection per IEC 60529	IP 67	IP 67
Housing Material	PBTP	PBTP
Material of Sensing Face	PBTP	PBTP
Connection	screw terminals	screw terminals
Max. Wire Size	≤ 14 AWG	≤ 14 AWG
Approvals	cULus	cULus
Mounting Variations Allowed	Figs. 1 and 2	Fig. 2

***Specify**
U - Plastic base with 1/2" NPT threads
M - Plastic base with metric threads

Mounting in non-ferrous metals

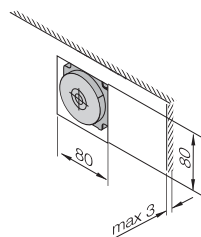


Fig. 1

Mounting in steel/non-ferrous metals

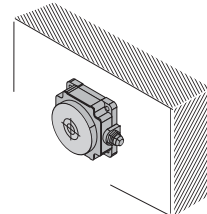
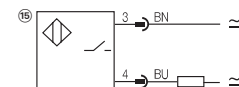


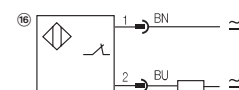
Fig. 2

Wiring Diagrams

AC/DC N/O



AC/DC N/C



DC 2-Wire

Inductive Sensors

DC 2-Wire
Tubular Sensors
Contents

Inductive

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Contents

Selection Charts

Part Numbers

Featured

GlobalProx®
– DC 3-Wire
– DC 2-Wire

SteelFace®
– 2x
– 3x
– Fe/NFe

Welding
– Factor 1
– Weld Field Immune
– SlagMaster®
– Welding Accessories

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

DC 2-Wire Block

Specialty

SuperShorties™
Proxinox®
High Temp
Analog
Large Housing
Ring Sensor

6

Connectors

7

Accessories

o

Product Overview

t

Technical Reference

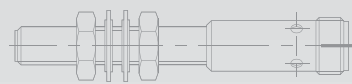
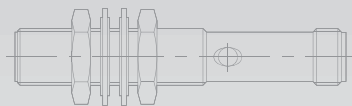
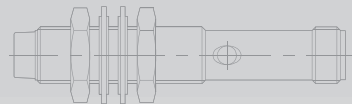
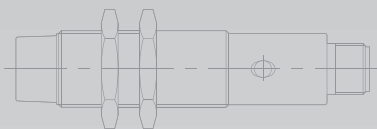
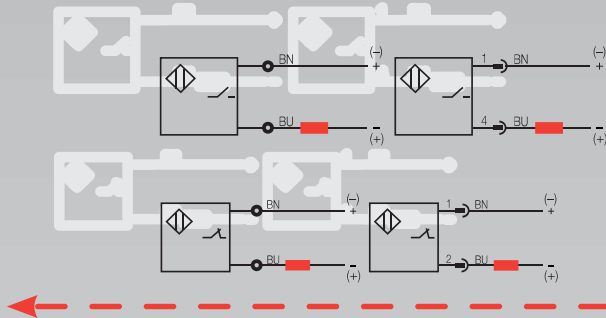
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Part Number Index

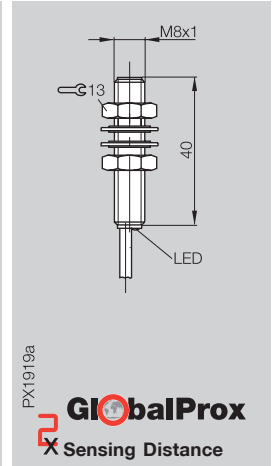
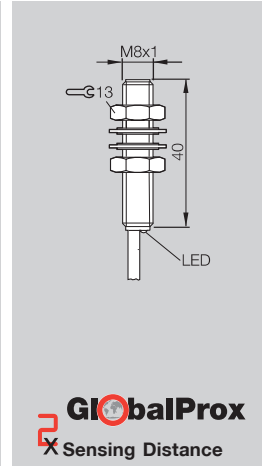
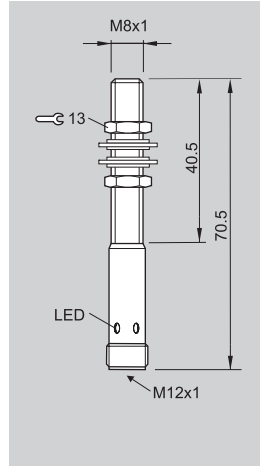
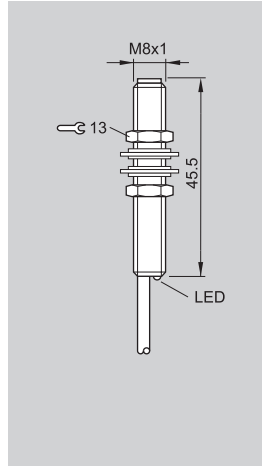
DC 2-Wire Tubular Sensors

Popular in many "New Domestic" automotive plants and automotive tier suppliers, Balluff's 2-wire DC tubular sensors are offered in Polarized and Non-Polarized configurations, flush and non-flush mounting, in standard and extended sensing ranges. Some models are also available with PTFE-coated housings to help repel welding spatter.

- 1.126** DC 2-Wire M8
- 1.127** DC 2-Wire M12
- 1.130** DC 2-Wire M18
- 1.132** DC 2-Wire M30



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

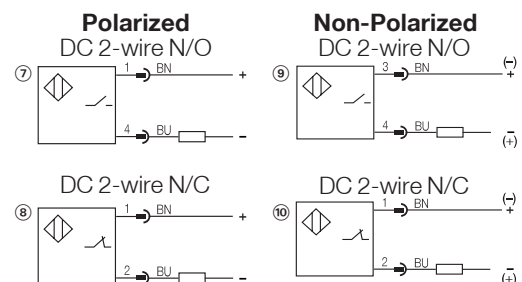


DC 2-wire Normally-open ⑦ ⑨			BES M08MG-USC20-BV03	BES M08MG-GSC20-BV03
DC 2-wire Normally-closed ⑧ ⑩	BES 516-527-E0-H-03	BES 516-527-S4-H		
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...55 Vdc	10...55 Vdc	10...30 Vdc	10...30 Vdc
Polarity	Non-polarized	Non-polarized	Non-polarized	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
Function Indication	yes	yes	yes	yes
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67	IP 67
Housing Material	stainless steel	stainless steel	brass, Ni free coated	brass, Ni free coated
Material of Sensing Face	PBTP	PBTP	PBT	PBT
Connection	cable	connector	cable	cable
No. of Wires x Gauge	2 x 26 AWG		2 x 26 AWG	2 x 26 AWG
Approvals	cULus	cULus	cULus	cULus
Recommended Connector N/O		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.

Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

Wiring Diagrams

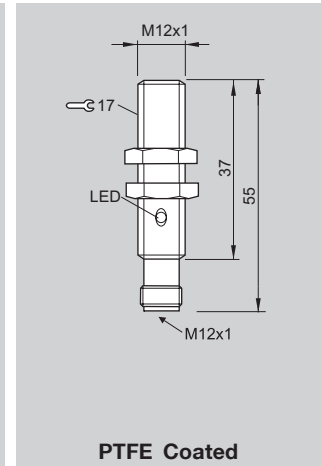
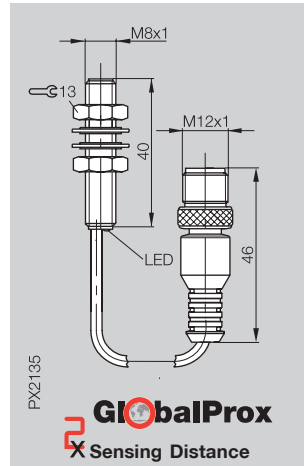
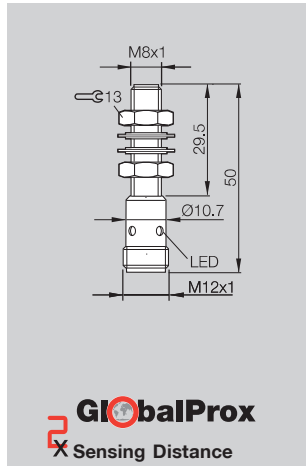
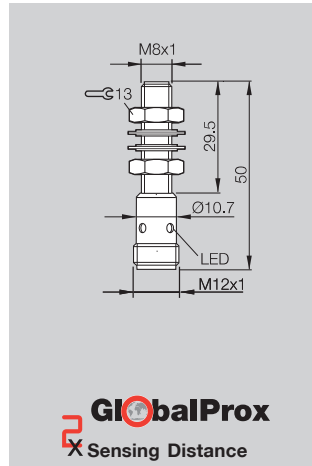


DC 2-Wire

Inductive Sensors

DC 2-Wire
M8, M12
S_n 2 mm

M8x1	M8x1	M8x1	M12x1
flush*	flush*	flush*	flush
2 mm	2 mm	2 mm	2 mm
0...1.6 mm	0...1.6 mm	0...1.6 mm	0...1.6 mm

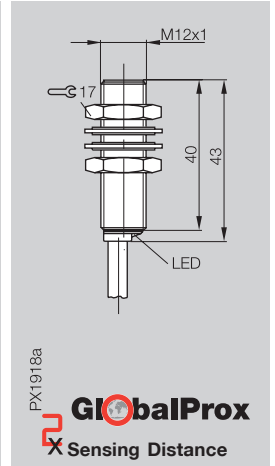
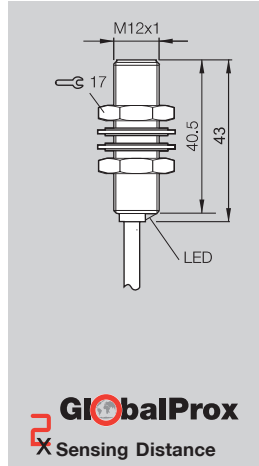
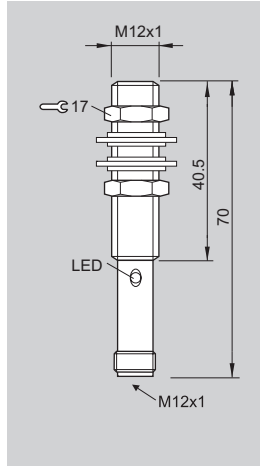
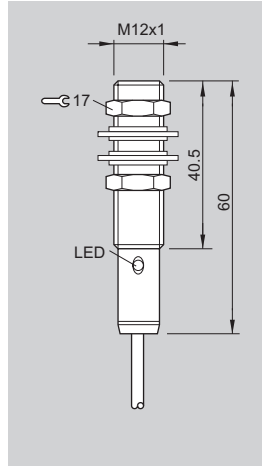


BES M08ME1-USC20B-S04G	BES M08ME1-GSC20B-S04G	BES M08MG-GSC20B-BP00,3-GS04	BES BC5T-1202-D-US
24 Vdc	24 Vdc	24 Vdc	24 Vdc
10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
Non-polarized	Polarized	Polarized	Polarized (3=load, 4=+)
≤ 5.0 V	≤ 4.0 V	≤ 5.1 V	≤ 3.5 V
75 Vdc	75 Vdc	75 Vdc	75 Vdc
100 mA	100 mA	100 mA	500 mA
5 mA	5 mA	5 mA	4 mA
≤ 600 µA	≤ 600 µA	≤ 500 µA	
yes	yes	no	no
yes	yes	yes	yes
≤ 1.0 µF	≤ 1.0 µF	≤ 1.0 µF	≤ 1.0 µF
≤ 5%	≤ 5%	≤ 5%	≤ 5%
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
1500 Hz	1500 Hz	≤ 800 Hz	≤ 800 Hz
yes	yes	yes	yes
IP 67	IP 67	IP 67	IP 67
brass, Ni free coated	brass, Ni free coated	brass, Ni free coated	PTFE coated brass
PBT	PBT	PBT	PTFE
connector	connector	cable with connector	connector
cULus	cULus	cULus	
C04 AEA-00-TY-050M	BKS-S19-13-PU-05	BKS-S19-13-PU-05	C04 AEA-00-TY-050M



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

Housing Size	M12x1	M12x1	M12x1	M12x1
Mounting	flush	flush	flush*	flush*
Rated Operating Distance s _n	2 mm	2 mm	3 mm	3 mm
Assured Operating Distance s _a	0...1.6 mm	0...1.6 mm	0...2.4 mm	0...2.4 mm

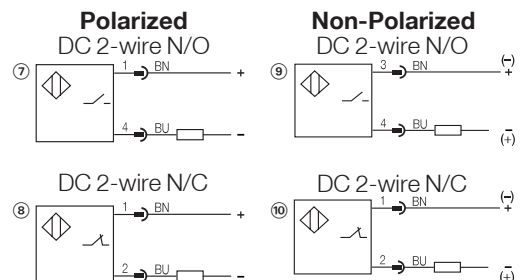


DC 2-wire Normally-open ⑦ ⑨			BES M12MG-USC30B-BV03	BES M12MG-GSC30B-BV03
DC 2-wire Normally-closed ⑧ ⑩	BES 516-543-B0-H-03	BES 516-543-S4-H		
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...55 Vdc	10...55 Vdc	10...30 Vdc	10...30 Vdc
Polarity	Non-polarized	Non-polarized	Non-polarized	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	250 Vac	250 Vac	75 Vdc	75 Vdc
Rated Operational Current I _e	200 mA	200 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	2500 Hz	2500 Hz	1300 Hz	1300 Hz
Function Indication	yes	yes	yes	yes
Degree of Protection per IEC 60529	IP 68	IP 68	IP 67	IP 67
Housing Material	stainless steel	stainless steel	brass, Ni free coated	brass, Ni free coated
Material of Sensing Face	PA 12	PA 12	PA 12	PA 12
Connection	cable	connector	cable	cable
No. of Wires x Gauge	2 x 22 AWG		2 x 22 AWG	2 x 22 AWG
Approvals	cULus	cULus	cULus	cULus
Recommended Connector N/O				
Recommended Connector N/C		C04 AEB-00-TY-050M		

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

Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

Wiring Diagrams



DC 2-Wire

Inductive Sensors

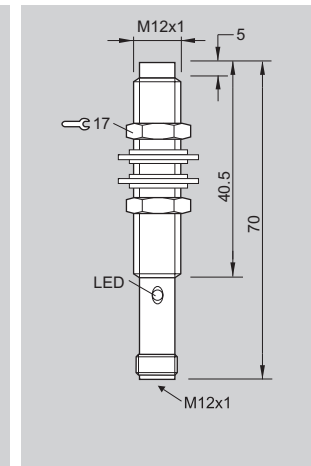
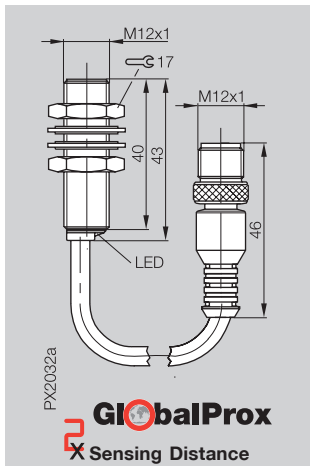
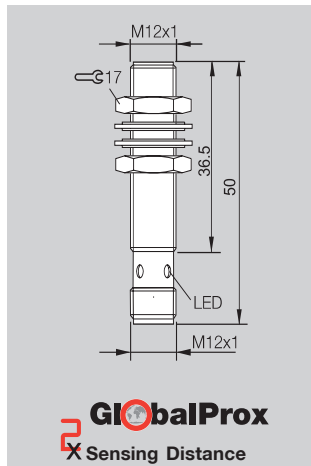
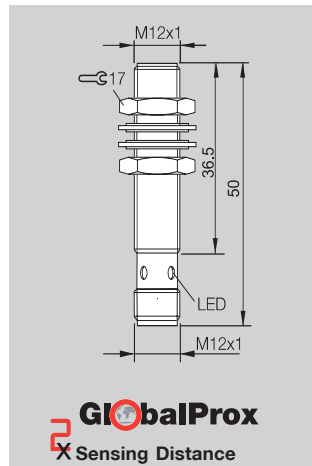
DC 2-Wire
M12
S_n 3 mm, 4 mm

M12x1
flush*
3 mm
0...2.4 mm

M12x1
flush*
3 mm
0...2.4 mm

M12x1
flush*
3 mm
0...2.4 mm

M12x1
non-flush
4 mm
0...3.2 mm



BES M12MF-USC30B-S04G
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
1300 Hz
yes
IP 67
brass, Ni free coated
PA 12
connector
C04 AEA-00-TY-050M

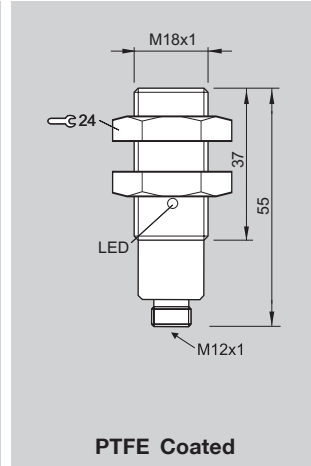
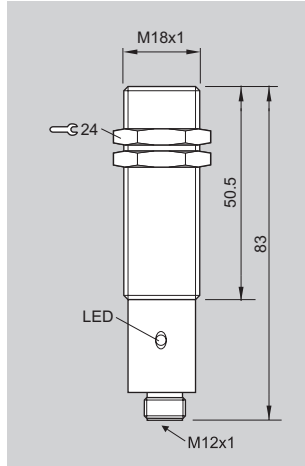
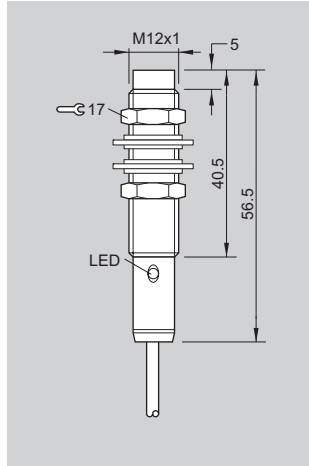
BES M12MF-GSC30B-S04G
24 Vdc
10...30 Vdc
Polarized
≤ 4.0 V
75 Vdc
100 mA
5 mA
≤ 600 μA
yes
yes
≤ 1.0 μF
≤ 5%
-25...+70 °C
1300 Hz
yes
IP 67
brass, Ni free coated
PA 12
connector
cULus
BKS-S19-13-PU-05

BES M12MG-GSC30B-BP00,3-GS04
24 Vdc
10...30 Vdc
Polarized
≤ 4.0 V
75 Vdc
100 mA
5 mA
≤ 600 μA
yes
yes
≤ 1.0 μF
≤ 5%
-25...+70 °C
1300 Hz
yes
IP 67
brass, Ni free coated
PA 12
cable with connector
cULus
BKS-S19-13-PU-05

BES 516-545-S4-H
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
1000 Hz
yes
IP 68
stainless steel
PA 12
connector
cULus
C04 AEB-00-TY-050M

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

Housing Size	M12x1	M18x1	M18 x1
Mounting	non-flush	flush	flush
Rated Operating Distance s _n	4 mm	5 mm	5 mm
Assured Operating Distance s _a	0...3.2 mm	0...4 mm	0...4 mm

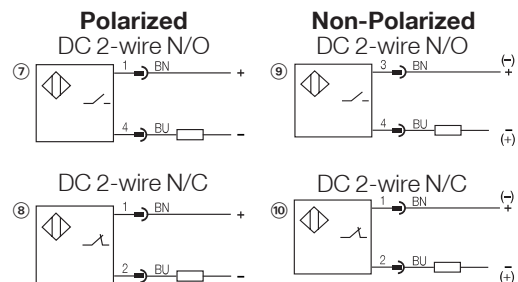


DC 2-wire Normally-open ⑦ ⑨			BES BC5T-1805-D-US
DC 2-wire Normally-closed ⑧ ⑩	BES 516-545-B0-H-03	BES 516-539-S4-H	
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...55 Vdc	10...55 Vdc	10...30 Vdc
Polarity	Non-polarized	Non-polarized	Polarized (3=load, 4=+)
Voltage Drop U _d at I _e	≤ 5.0 V	≤ 5.0 V	≤ 3.5 V
Rated Insulation Voltage U _i	250 Vac	250 Vac	75 Vdc
Rated Operational Current I _e	200 mA	200 mA	100 mA
Minimum Operational Current I _m	5 mA	5 mA	4 mA
Off-state Current I _r	≤ 500 μA	≤ 500 μA	≤ 600 μA
Protected Against Polarity Reversal	yes	yes	no
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	1000 Hz	250 Hz	500 Hz
Function Indication	yes	yes	yes
Degree of Protection per IEC 60529	IP 68	IP 68	IP 67
Housing Material	stainless steel	nickel plated brass	PTFE coated brass
Material of Sensing Face	PA 12	PA 12	PTFE
Connection	cable	connector	connector
No. of Wires x Gauge	2 x 22 AWG		
Approvals	cULus	cULus	
Recommended Connector N/O			C04 AEA-00-TY-050M
Recommended Connector N/C		C04 AEB-00-TY-050M	

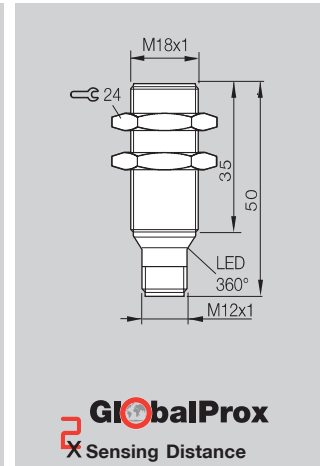
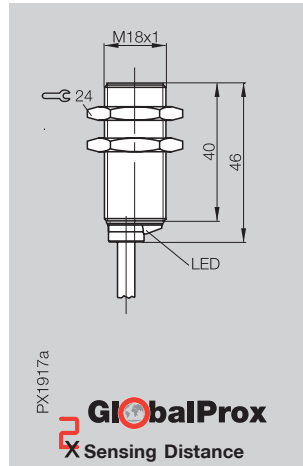
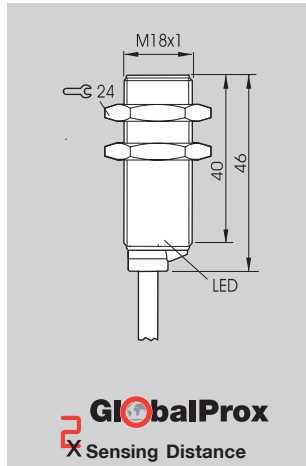
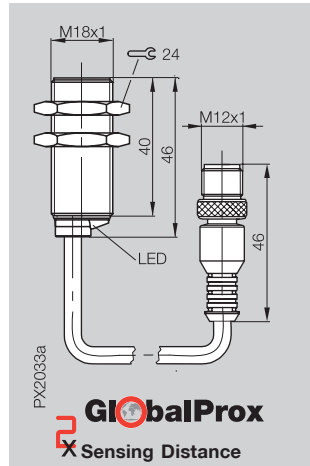
* See technical section for proper mounting of the 2x, 3x, and 4x long range sensors.

Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

Wiring Diagrams



M18 x1 flush* 7 mm 0...5.7 mm	M18x1 flush* 7 mm 0...5.7 mm	M18x1 flush* 7 mm 0...5.7 mm	M18x1 flush* 7 mm 0...5.7 mm
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BES M18MG-GSC70B-BP00,3-GS04	BES M18MG-USC70B-BV03	BES M18MG-GSC70B-BV03	BES M18MF-USC70B-S04K
24 Vdc	24 Vdc	24 Vdc	24 Vdc
10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
Polarized	Non-polarized	Polarized	Non-polarized
≤ 5.0 V	≤ 5.0 V	≤ 5.0 V	≤ 5.0 V
75 Vdc	75 Vdc	75 Vdc	75 Vdc
100 mA	100 mA	100 mA	100 mA
5 mA	5 mA	5 mA	5 mA
≤ 600 μA	≤ 600 μA	≤ 600 μA	≤ 600 μA
yes	yes	yes	yes
yes	yes	yes	yes
≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF
≤ 5%	≤ 5%	≤ 5%	≤ 5%
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
600 Hz	600 Hz	600 Hz	600 Hz
yes	yes	yes	yes
IP 67	IP 67	IP 67	IP 67
nickel free brass	brass, Ni free coated	brass, Ni free coated	nickel free brass
PA 12	PA 12	PA 12	PA 12
cable with connector	cable	cable	connector
cULus	2 x 22 AWG	2 x 22 AWG	cULus
BKS-S 19-13-PU-05	cULus	cULus	C04 AEA-00-TY-050M



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

- Contents
- Selection Charts
- Part Numbers
- Featured
 - GlobalProx®
 - DC 3-Wire
 - DC 2-Wire
 - SteelFace®
 - 2x
 - 3x
 - Fe/NFe
 - Welding
 - Factor 1
 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories

- 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**
 - DC 2-Wire Block
 - Specialty
 - SuperShorties™
 - Proxinox®
 - High Temp
 - Analog
 - Large Housing
 - Ring Sensor

6 Connectors

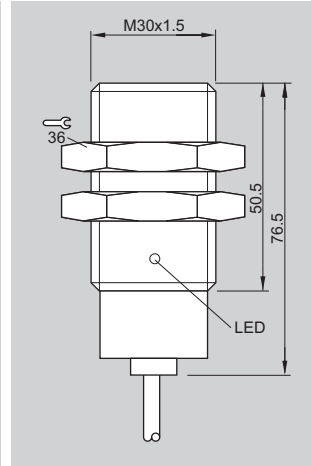
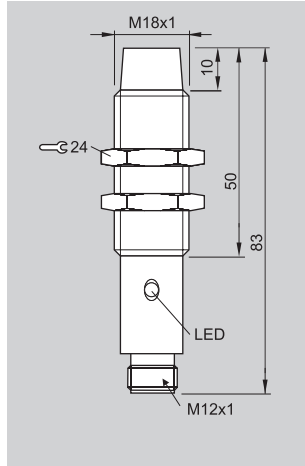
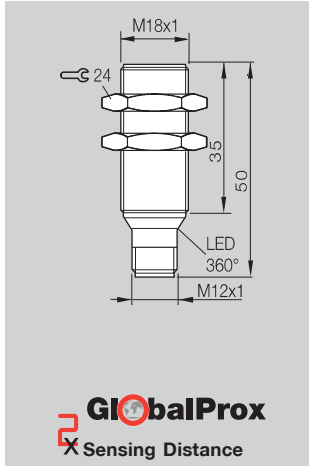
7 Accessories

o Product Overview

t Technical Reference

p Part Number Index

Housing Size	M18x1	M18x1	M30x1.5
Mounting	flush*	non-flush	flush
Rated Operating Distance s _n	7 mm	8 mm	10 mm
Assured Operating Distance s _a	0...5.7 mm	0...6.5 mm	0...8.1 mm

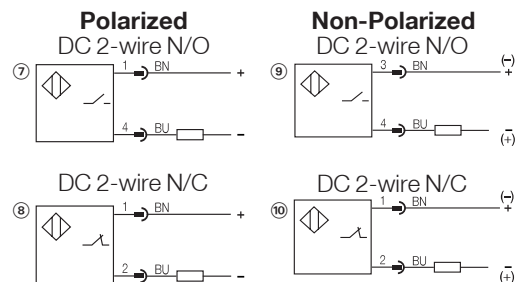


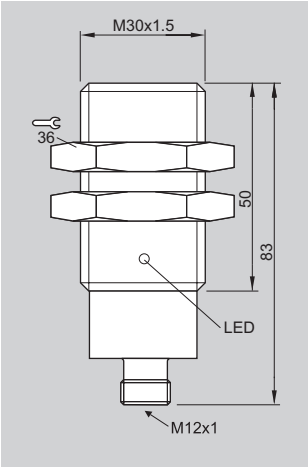
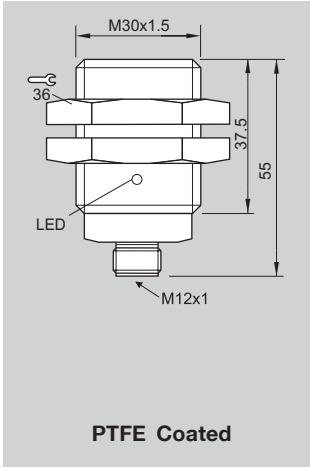
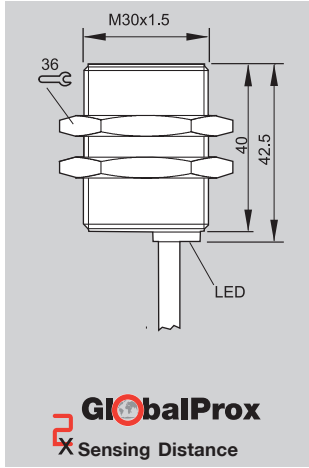
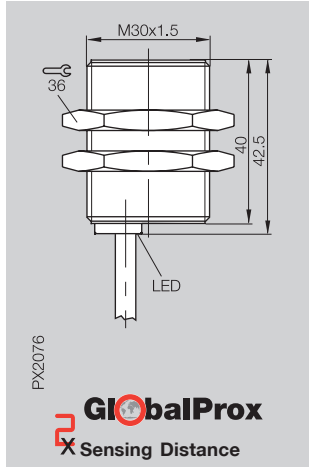
DC 2-wire Normally-open ⑦ ⑨	BES M18MF-GSC70B-S04K	BES 516-547-S 4-H	BES 516-541-B0-H-PU-05
DC 2-wire Normally-closed ⑧ ⑩			
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...30 Vdc	10...55 Vdc	10...55 Vdc
Polarity	Polarized	Non-polarized	Non-polarized
Voltage Drop U _d at I _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	600 Hz	200 Hz	150 Hz
Function Indication	yes	yes	yes
Degree of Protection per IEC 60529	IP 67	IP 68	IP 68
Housing Material	brass, Ni free coated	nickel plated brass	nickel plated brass
Material of Sensing Face	PBT	PA 12	PA 12
Connection	connector	connector	cable
No. of Wires x Gauge			2 x 22 AWG
Approvals	cULus	cULus	cULus
Recommended Connector N/O	BKS-S19-13-PU-05		
Recommended Connector N/C		C04 AEB-00-TY-050M	

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

Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

Wiring Diagrams

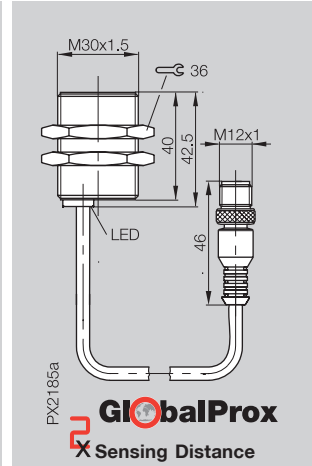
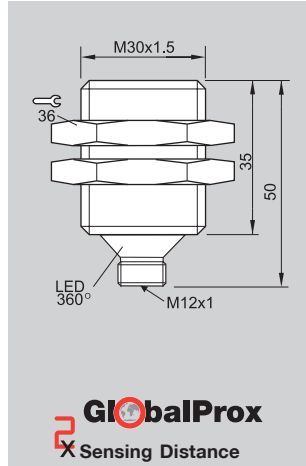
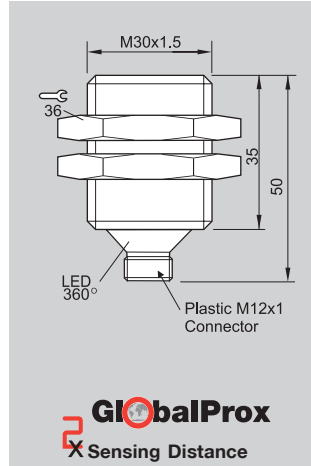


M30×1.5 flush 10 mm 0...8.1 mm	M30×1.5 flush 10 mm 0...8.1 mm	M30×1.5 flush* 15 mm 0...12.2 mm	M30×1.5 flush* 15 mm 0...12.2 mm
			
BES 516-541-S4-H	BES BC5T-3010-D-US	BES M30MF-USC15B-BV03	BES M30MF-GSC15B-BV02
24 Vdc 10...55 Vdc Non-polarized ≤ 5.0 V 250 Vac 200 mA 5 mA ≤ 500 µA yes yes ≤ 1.0 µF	24 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 Polarized ≤ 5.0 V 75 Vdc 100 mA 5 mA ≤ 600 µA yes yes ≤ 1.0 µF
≤ 5 % -25...+70 °C 150 Hz yes IP 68 nickel plated brass PA 12 connector cULus	≤ 5 % -25...+70 °C 300 Hz yes IP 67 PTFE coated brass PTFE connector C04 AEA-00-TY-050M	≤ 5 % -25...+70 °C 400 Hz yes IP 67 brass, Ni free coated PA 12 cable 2 x 22 AWG cULus	≤ 5 % -25...+70 °C 400 Hz yes IP 67 brass, Ni free coated PA 12 cable 2 x 22 AWG cULus
C04 AEB-00-TY-050M			



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

Housing Size	M30×1.5	M30×1.5	M30×1.5
Mounting	flush*	flush*	flush*
Rated Operating Distance s _n	15 mm	15 mm	15 mm
Assured Operating Distance s _a	0...12.2 mm	0...12.2 mm	0...12.2 mm

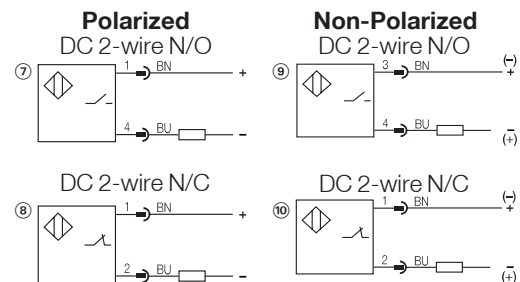


DC 2-wire Normally-open ⑦ ⑨	BES M30MF-USC15B-S04K	BES M30MF-GSC15B-S04K	BES M30MF-GSC15B-BP00,3-GS04
DC 2-wire Normally-closed ⑧ ⑩			
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	10...30 Vdc
Polarity	Non-polarized	Polarized	Polarized
Voltage Drop U _d at I _e	≤ 5.0 V	≤ 4.0 V	≤ 4.0 V
Rated Insulation Voltage U _i	75 Vdc	75 Vdc	75 Vdc
Rated Operational Current I _e	100 mA	100 mA	100 mA
Minimum Operational Current I _m	5 mA	5 mA	5 mA
Off-state Current I _r	≤ 600 μA	≤ 600 μA	≤ 600 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	400 Hz	400 Hz
Function Indication	yes	yes	yes
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67
Housing Material	brass, Ni free coated	brass, Ni free coated	brass, Ni free coated
Material of Sensing Face	PA 12	PA 12	PA 12
Connection	connector	connector	cable with connector
No. of Wires × Gauge			
Approvals	cULus	cULus	cULus
Recommended Connector N/O	C04 AEA-00-TY-050M	BKS-S19-13-PU-05	BKS-S19-13-PU-05
Recommended Connector N/C			

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

Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

Wiring Diagrams

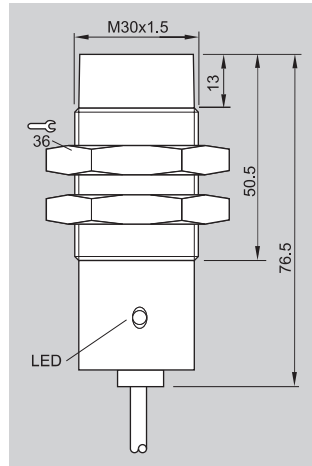


DC 2-Wire

Inductive Sensors

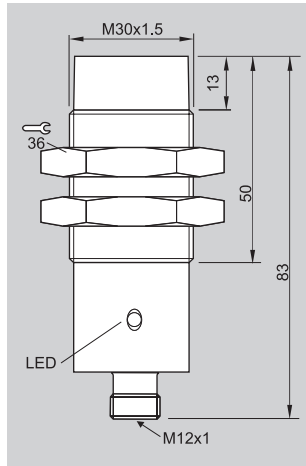
DC 2-Wire
M30
S_n 15 mm

M30x1.5	M30x1.5
non-flush	non-flush
15 mm	15 mm
0...12 mm	0...12 mm



BES 516-548-B0-H-03

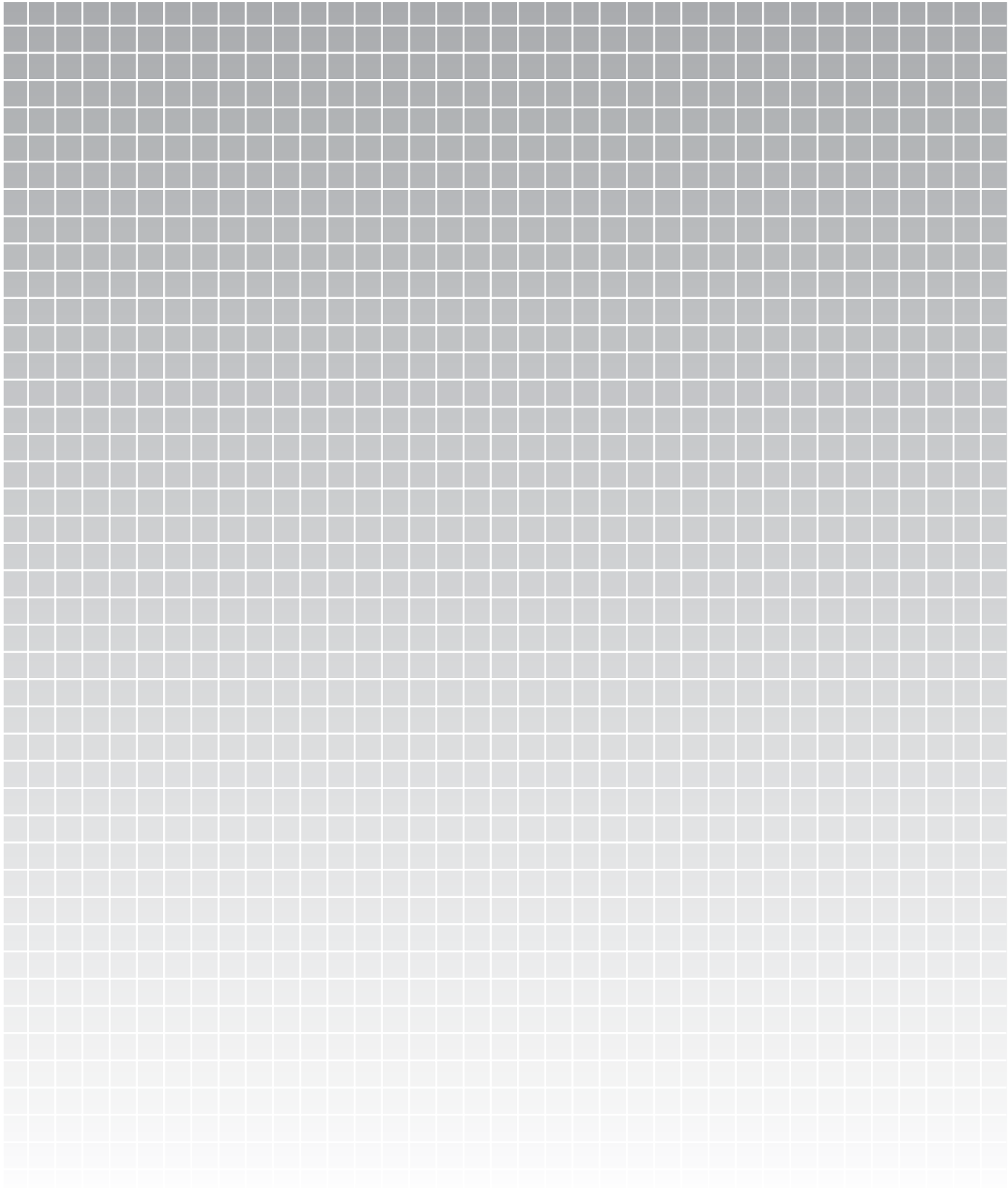
24 Vdc
10...55 Vdc
Non-polarized
≤ 5.0 V
250 Vac
200 mA
5 mA
≤ 500 μA
yes
yes
≤ 1.0 μF
≤ 5 %
-25...+70 °C
100 Hz
yes
IP 68
nickel plated brass
PA 12
cable
2 × 22 AWG
cULus



BES 516-548-S4-H
BES 516-549-S4-H

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
100 Hz
yes
IP 68
nickel plated brass
PA 12
connector
cULus
C04 AEA-00-TY-050M
C04 AEB-00-TY-050M





DC 2– Wire



Inductive Sensors

DC 2-Wire
Block Sensors
Contents

DC 2-Wire Block Sensors

Balluff's 2-wire DC block style sensors offer long range performance compatibility with the 2-wire control systems found in many "New Domestic" automotive plants and automotive tier suppliers.

- 1.138** DC 2-wire 40×40×66 mm Unicomact
- 1.139** DC 2-wire 80×92×40 mm Maxisensor
- 1.140** DC 2-wire 26×26×26 mm

Inductive

1

- Contents
- Selection Charts
- Part Numbers
- Featured**
- GlobalProx®
 - DC 3-Wire
 - DC 2-Wire
- SteelFace®
 - 2x
 - 3x
 - Fe/NFe
- Welding
 - Factor 1
 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories

- 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

- DC 2-Wire Block**
- Specialty**
- SuperShorties™
- Proxinox®
- High Temp
- Analog
- Large Housing
- Ring Sensor

6 Connectors

7 Accessories

o Product Overview

t Technical Reference

p Part Number Index

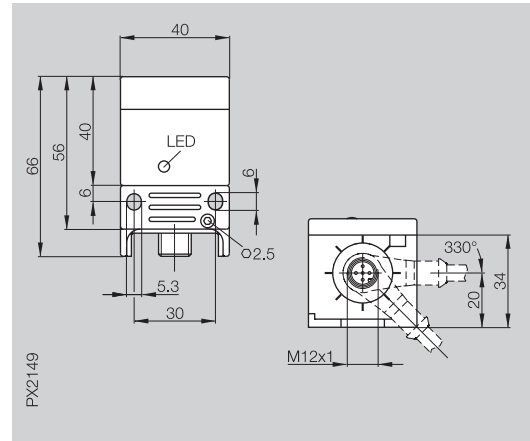
Housing Size	40x40x66 mm
Mounting	flush
Rated Operating Distance s_n	15 mm
Assured Operating Distance s_a	0...12.2 mm

Unicomact (40x40x66)

The flexible sensor for machine and systems building. The sensing face can be set in 5 directions, allowing for a multitude of mounting options.

Maxisensor (80x92x40)

Long switching distance with low installation height in the detection direction. Ideal for systems building and conveying equipment.



DC 2-wire	Normally-open	⑦ polarized	BES Q40KFU-GSH15B-S04G
DC 2-wire	Normally-closed	⑧ polarized	

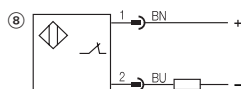
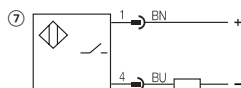
Rated Operational Voltage U_o	24 Vdc
Supply Voltage U_B	10...55 Vdc
Polarity	Polarized
Voltage Drop U_d at I_o	≤ 4.6 V
Rated Insulation Voltage U_i	250 Vac
Rated Operational Current I_o	100 mA
Minimum Operating Current I_m	2 mA
Off-state Current I_r	≤ 800 μ A
Protected Against Polarity Reversal	yes
Short Circuit Protected	yes
Load Capacitance	1.0 μ F
Repeat Accuracy R	≤ 10 %
Ambient Temperature Range T_a	-25...+70 °C
Operating Frequency f	150 Hz
Function Indicator	yes
Degree of Protection per IEC 60529	IP 67
Housing Material	PBT
Material of Sensing Face	PEI
Connection	Connector
Recommended Connector	BKS S19-13-PU-05

Refer to technical section for mounting guidelines

Wiring Diagrams

Polarized

DC 2-wire N/O

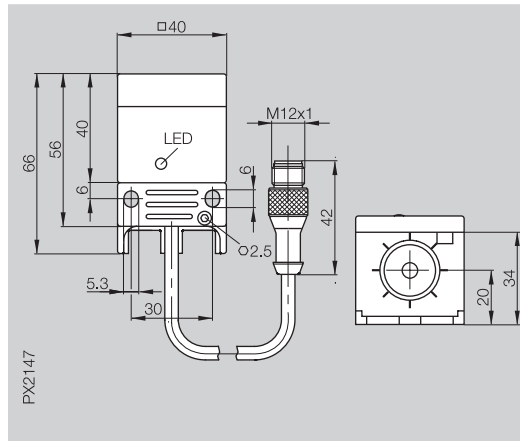


40×40×66 mm, 80×92×40 mm

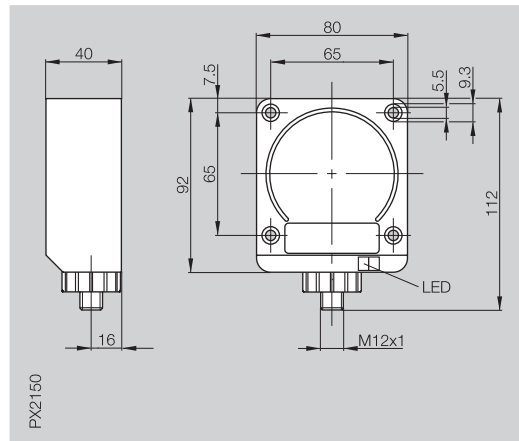
Inductive Sensors

DC 2-wire
Block style housings
s_n 15 mm, 50 mm

40×40×66 mm	80×92×40 mm
flush	flush
15 mm	50 mm
0...12.2 mm	0...40.5 mm



BES Q40KFU-GSH15B-EP00,8-GS04
BES Q40KFU-GOH15B-EP00,8-GS04



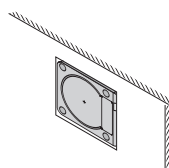
BES Q80KA-GSH50B-S04Q

24 Vdc	24 Vdc
10...55 Vdc	10...55 Vdc
Polarized	Polarized
≤ 4.6 V	≤ 4.6 V
250 Vac	250 Vac
100 mA	400 mA
2 mA	4 mA
≤ 800 μA	≤ 600 μA
yes	yes
yes	yes
1.0 μF	1.0 μF
≤ 10 %	≤ 10 %
-25...+70 °C	-25...+50 °C
150 Hz	90 Hz
yes	yes
IP 67	IP 67
PBT	PPE
PEI	PPE
Cable with connector	Connector
BKS S19-13-PU-05	BKS S19-13-PU-05

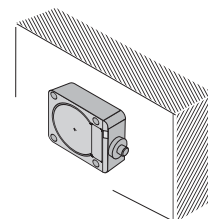


Permissible mounting variations for Maxisensor

**Mounting in steel/
non-ferrous metals**



**Mounting on steel/
non-ferrous metals**



For non-flush mounting the switching distance is reduced by max. 5.5 mm.

Inductive Sensors

DC 2-wire
Block style housings
s_n 10 mm

26×26×26 mm

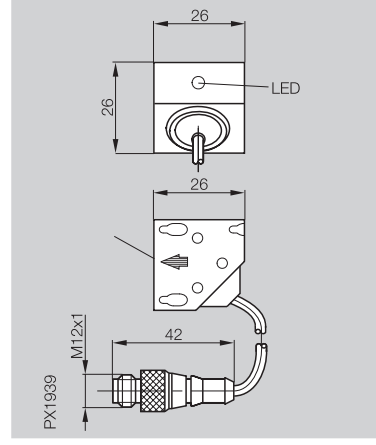
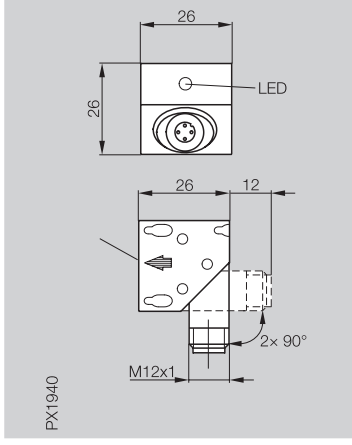
Small, compact block sensor with 10 mm nominal switching distance for fast installation

The connector mount is rotatable and the sensing face can be oriented in 3 directions.

Simple replacement with no loss of position thanks to the fixed mounting plate:

- Cost savings
- No special tools necessary
- Simple to install

Housing Size	26×26×26 mm	26×26×26 mm
Mounting	flush	flush
Rated Operating Distance s _n	10 mm	10 mm
Assured Operating Distance s _a	0...8.1 mm	0...8.1 mm



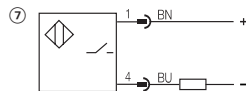
DC 2-wire Normally-open ⑦ polarized **BES Z03K-GSS10B-S04U-006** **BES Z03K-GSS10B-EP00,15-GS04-006**

Rated Operational Voltage U _e	24 Vdc	24 Vdc
Supply Voltage U _B	10...36 Vdc	10...36 Vdc
Polarity	Polarized	Polarized
Voltage Drop U _d at I _e	≤ 4.5 V	≤ 4.5 V
Rated Insulation Voltage U _i	250 V AC	250 V AC
Rated Operational Current I _e	100 mA	100 mA
Minimum Operating Current I _m	2 mA	2 mA
Off-state Current I _r	≤ 600 μA	≤ 600 μA
Protected Against Polarity Reversal	yes	yes
Short Circuit Protected	yes	yes
Load Capacitance	0.1 μF	0.1 μF
Repeat Accuracy R	≤ 10	≤ 10
Ambient Temperature Range T _a	-25...+70 °C	-25...+70 °C
Operating Frequency f	250 Hz	250 Hz
Function Indicator	yes	yes
Degree of Protection per IEC 60529	IP 67	IP 67
Housing Material	Polyarylamide	Polyarylamide
Material of Sensing Face	Polyarylamide	Polyarylamide
Connection	Connector	Cable with connector
Recommended Connector	BKS S19-13-PU-05	BKS S19-13-PU-05

Wiring Diagram

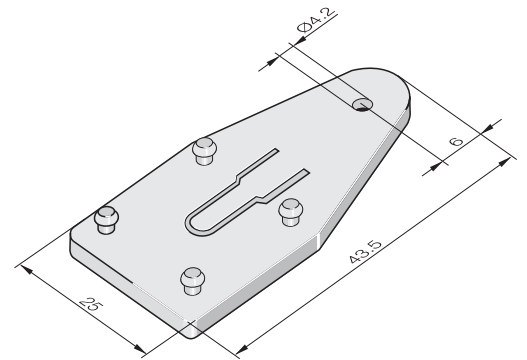
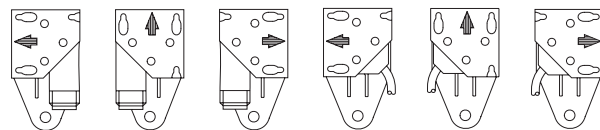
Polarized

DC 2-wire N/O



Mounting plate

(included in delivery)



SuperShorties™

Exceptionally short tubular inductive proximity sensors, Balluff SuperShorties™ open up new frontiers for machine designers. Intended primarily for OEM applications, these ultra-short sensors help fuel the drive toward more compact machinery. Balluff SuperShorties™ can be installed into cramped places where conventional inductive sensors simply won't fit. Their extremely low mass enables abrupt acceleration and deceleration on highly dynamic, fast-moving equipment without adding excessive inertial load.

- 1.142** DC 3-wire Ø 6.5 mm
- 1.143** DC 3-wire M8

Contents

Selection Charts

Part Numbers

Featured

GlobalProx®
 – DC 3-Wire
 – DC 2-Wire

SteelFace®
 – 2x
 – 3x
 – Fe/NFe

Welding
 – Factor 1
 – Weld Field Immune
 – SlagMaster®
 – Welding Accessories

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

DC 2-Wire Block

Specialty

SuperShorties™
 Proxinox®
 High Temp
 Analog
 Large Housing
 Ring Sensor

6

 Connectors

7

 Accessories

o

 Product Overview

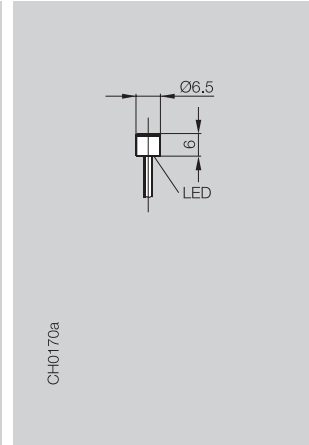
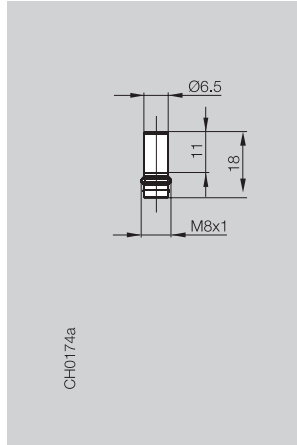
t

 Technical Reference

p

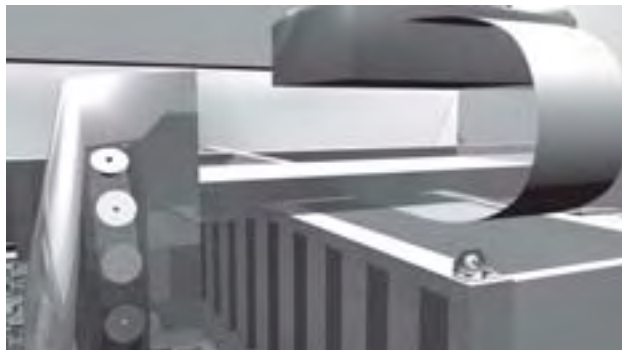
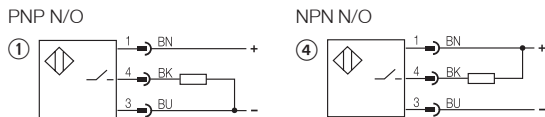
 Part Number Index


Housing Size	\varnothing 6.5 mm	\varnothing 6.5 mm
Mounting	flush	flush
Rated Operating Distance s_n	1.5 mm	1.5 mm
Assured Operating Distance s_a	0...1.2 mm	0...1.2 mm

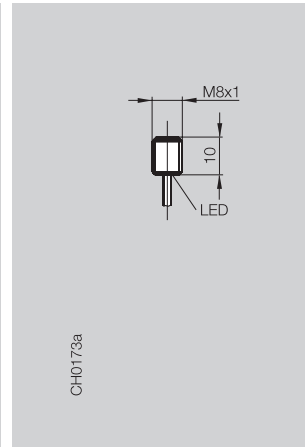
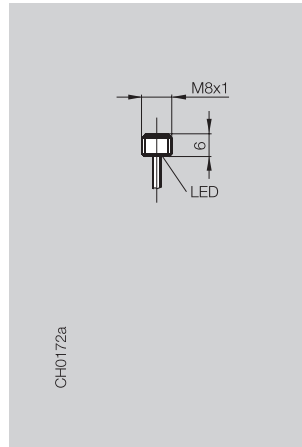
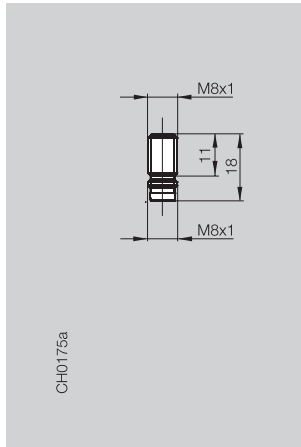
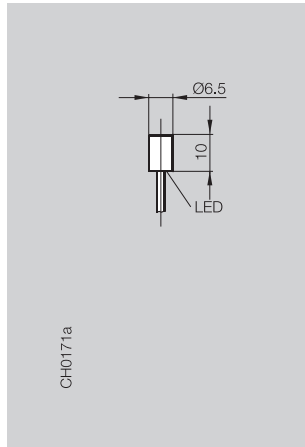


PNP	Normally-open ①	BES G06EA-PSD15B-S49G	BES G06E60-PSC15B-EP02
NPN	Normally-open ④	BES G06EA-NSD15B-S49G	BES G06E60-NSC15B-EP02
Rated Operational Voltage U_o	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U_B	10...30 Vdc	10...30 Vdc	10...30 Vdc
Voltage Drop U_d at I_o	≤ 3 V	≤ 3 V	≤ 3 V
Rated Insulation Voltage U_i	75 Vdc	75 Vdc	75 Vdc
Rated Operational Current I_o	150 mA	150 mA	150 mA
No-load Supply Current I_o max.	≤ 10 mA PNP/ ≤ 14 mA NPN	≤ 10 mA PNP/ ≤ 14 mA NPN	≤ 10 mA PNP/ ≤ 14 mA NPN
Load Capacitance	≤ 2.0 μ F	≤ 2.0 μ F	≤ 2.0 μ F
Polarity Reversal Protected	yes	yes	yes
Short Circuit Protected	yes	yes	yes
Load Capacitance	≤ 10 μ A	≤ 10 μ A	≤ 10 μ A
Operating Frequency f	3000 Hz	3000 Hz	3000 Hz
Repeat Accuracy R	≤ 5.0 %	≤ 5.0 %	≤ 5.0 %
Ambient Temperature Range T_a	-25°C to +70 °C	-25°C to +70 °C	-25°C to +70 °C
Housing Material	Stainless Steel	Stainless Steel	Stainless Steel
Material of Sensing Face	POM	POM	POM
LED Function Indicator	no	yes	yes
Connection Type	connector	cable	cable
No. of Wires x Gauge		3 x 28 AWG	3 x 28 AWG
Approval	cULus	cULus	cULus
Recommended Connector	C49 ANE-00-VY-050M		

Wiring Diagrams



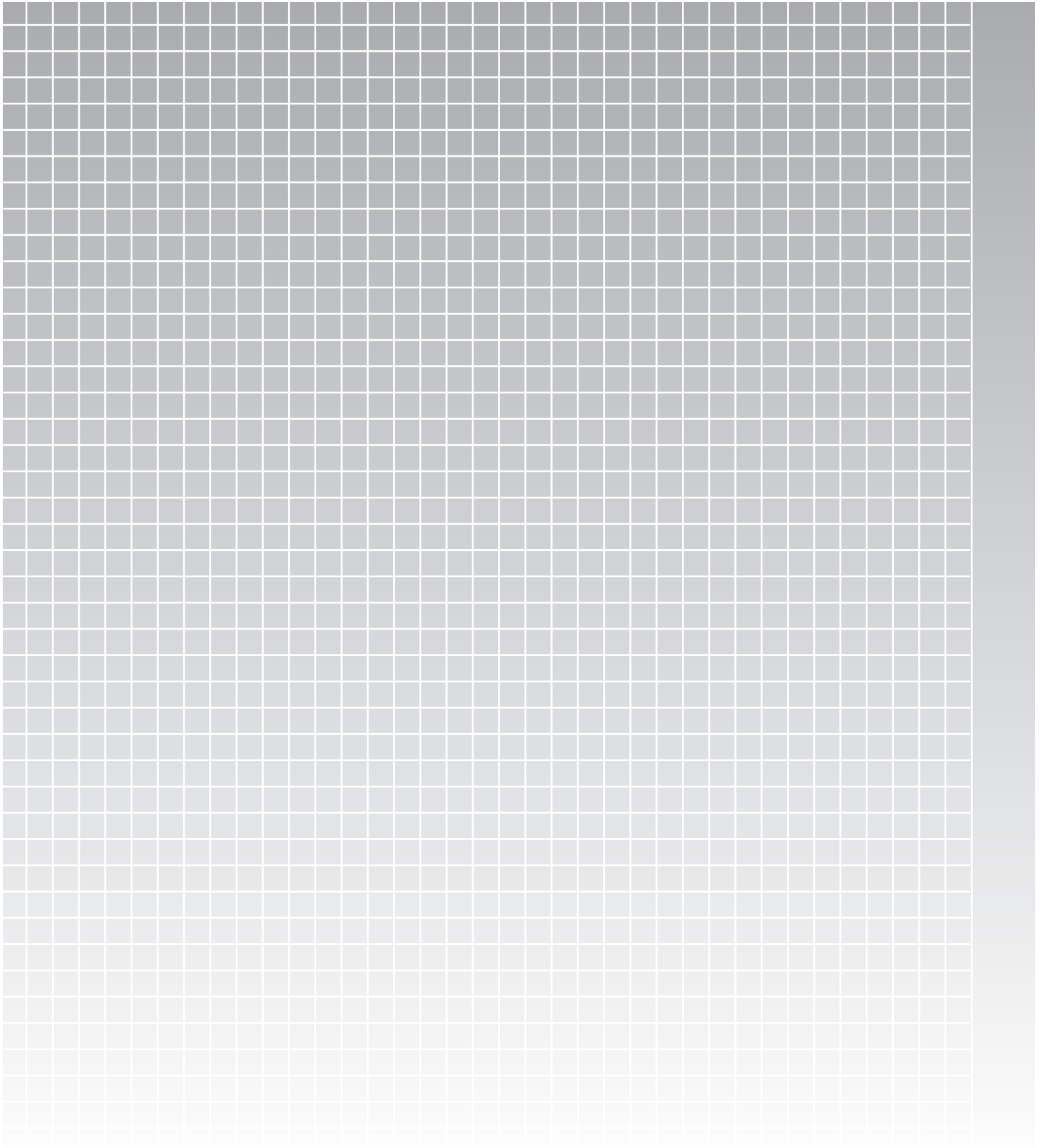
Ø 6.5 mm	M8x1	M8x1	M8x1
flush	flush	flush	flush
1.5 mm	1.5 mm	1.5 mm	1.5 mm
0...1.2 mm	0...1.2 mm	0...1.2 mm	0...1.2 mm



BES G06EA-PSC15B-EP02 BES G06EA-NSC15B-EP02	BES M08EA-PSD15B-S49G BES M08EA-NSD15B-S49G	BES M08E60-PSC15B-EP02 BES M08E60-NSC15B-EP02	BES M08EA-PSC15B-EP02 BES M08EA-NSC15B-EP02
24 Vdc	24 Vdc	24 Vdc	24 Vdc
10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
≤ 3 V	≤ 3 V	≤ 3 V	≤ 3 V
75 Vdc	75 Vdc	75 Vdc	75 Vdc
150 mA	150 mA	150 mA	150 mA
≤ 10 mA PNP/≤ 14 mA NPN	≤ 10 mA PNP/≤ 14 mA NPN	≤ 10 mA PNP/≤ 14 mA NPN	≤ 10 mA PNP/≤ 14 mA NPN
≤ 2.0 µF	≤ 2.0 µF	≤ 2.0 µF	≤ 2.0 µF
yes	yes	yes	yes
yes	yes	yes	yes
≤ 10 µA	≤ 10 µA	≤ 10 µA	≤ 10 µA
3000 Hz	3000 Hz	3000 Hz	3000 Hz
≤ 5.0 %	≤ 5.0 %	≤ 5.0 %	5.0 %
-25°C to +70 °C	-25°C to +70 °C	-25°C to +70 °C	-25°C to +70 °C
Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
POM	POM	POM	POM
yes	no	yes	yes
cable	connector	cable	cable
3 x 28 AWG		3 x 28 AWG	3 x 28 AWG
cULus	cULus C49 ANE-00-VY-050M	cULus	cULus

For mounting brackets see page 7.8.





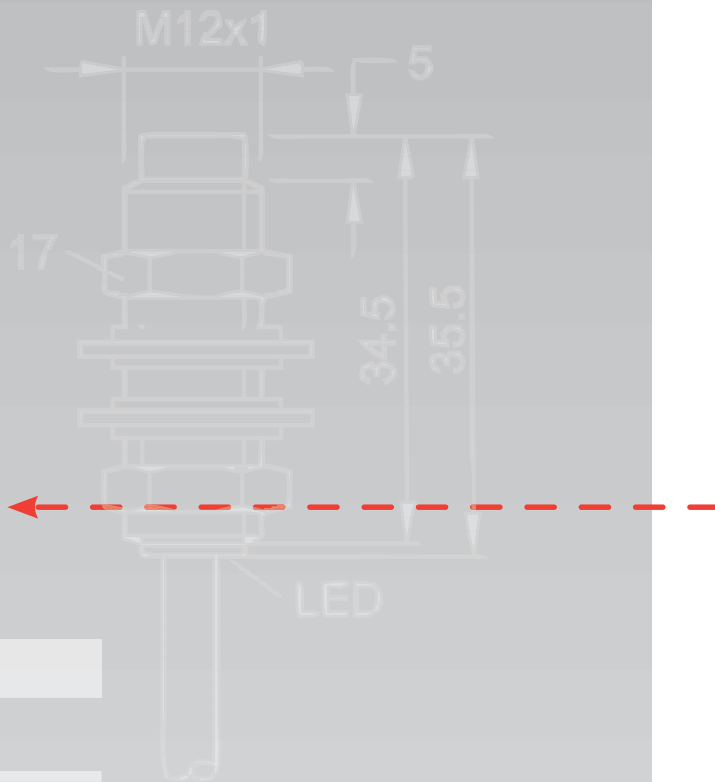
PROXINOX®

Balluff PROXINOX® and PROXINOX® Harsh Environment sensors are designed for wet and washdown conditions in the chemical and food industries. These sensors are resistant to aggressive cleaning agents, coolants, oils, and hydraulic fluids. PROXINOX sensors are available in two body types: LED and non-LED. The latter offers additional features giving it even greater resistance to harsh environments as described later in this section.

PROXINOX® Highlights:

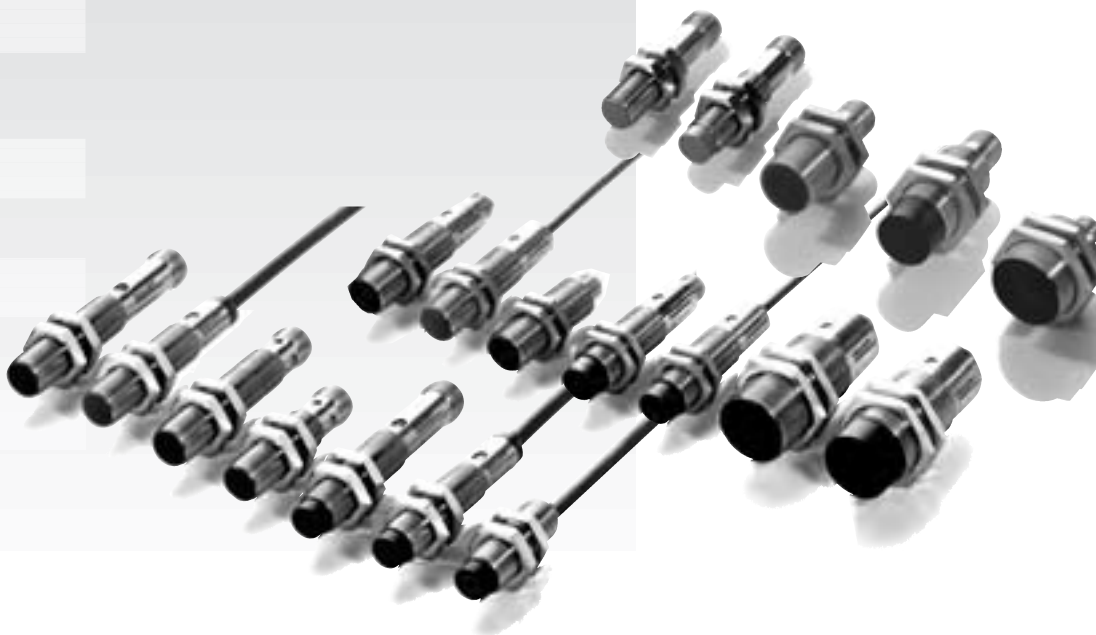
- Double insulated to VDE 0110 and cULus 2097 specifications. They have plastic inner sleeves encapsulated into 303 stainless steel housings. This double wall design creates a waterproof IP68-rated sensor.
- The cable-out types are supplied with PUR cables which feature an outer jacket material that is flame retardant to VDE 0472 and cULus 94 specifications and which is resistant to aggressive cleaning fluids, coolants, and other caustic chemicals.
- For the connector types, the recommended cables have PVC jackets and stainless steel coupling nuts.

- 1.146** DC 3-/4-Wire M12
- 1.147** DC 3-/4-Wire M18
- 1.149** DC 3-/4-Wire M30
- 1.150** DC 3-/4-Wire M12 Harsh Environment
- 1.151** DC 3-/4-Wire M18, M30 Harsh Environment



PROXINOX®

PROXINOX® Harsh Environment



- Contents
- Selection Charts
- Part Numbers
- Featured
 - GlobalProx®
 - DC 3-Wire
 - DC 2-Wire
 - SteelFace®
 - 2x
 - 3x
 - Fe/NFe
 - Welding
 - Factor 1
 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories

- 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
 - DC 2-Wire Block
- Specialty
 - SuperShorties™
 - Proxinox® High Temp
 - Analog
 - Large Housing
 - Ring Sensor

6 Connectors

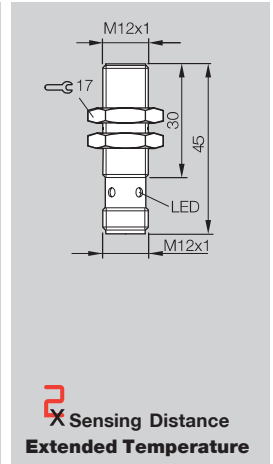
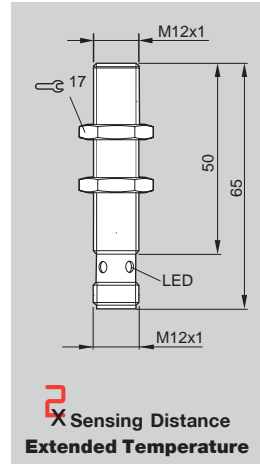
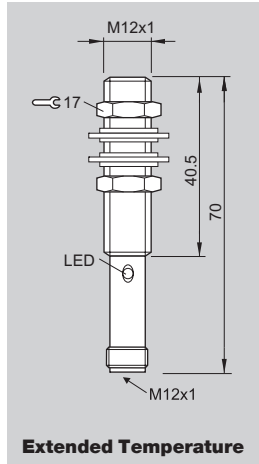
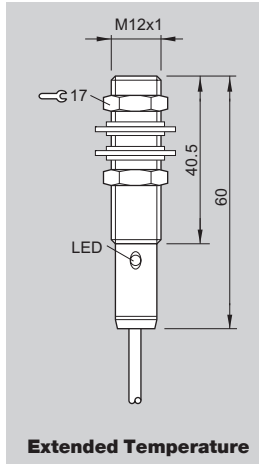
7 Accessories

o Product Overview

t Technical Reference

p Part Number Index

Housing Size	M12x1	M12x1	M12x1	M12x1
Mounting	flush	flush	flush*	flush*
Rated Operating Distance s _n	2 mm	2 mm	4 mm	4 mm
Assured Operating Distance s _a	0...1.6 mm	0...1.6 mm	0...3.2 mm	0...3.2 mm

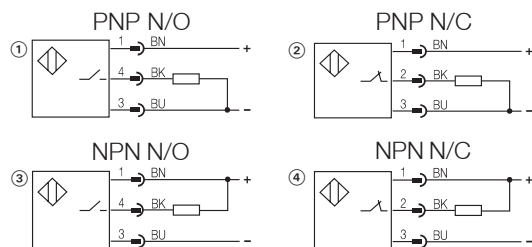


PNP	Normally open ①	BES 515-325-BO-C-PU-03	BES 515-325-S4-C	BES M12EI-PSC40B-S04G	BES M12EE-PSC40B-S04G
	Normally-closed ②			BES M12EI-POC40B-S04G	BES M12EE-POC40B-S04G
NPN	Normally-open ④			BES M12EI-NSC40B-S04G	
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
Voltage Drop U _d at I _e	typ. 1.5 V	typ. 1.5 V	≤ 2.5 V	typ. 2 V	
Rated Insulation Voltage U _i	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac
Rated Operational Current I _e	200 mA	200 mA	200 mA	200 mA	200 mA
No-load Supply Current I ₀ d./und.	≤ 8 mA / ≤ 1 mA	≤ 8 mA / ≤ 1 mA	≤ 10 mA	≤ 10 mA	≤ 10 mA
Off-state Current I _r	≤ 50 μA	≤ 50 μA	≤ 10 μA	≤ 50 μA	≤ 50 μA
Protected Against Polarity Reversal	yes	yes	yes	yes	yes
Short Circuit Protected	yes	yes	yes	yes	yes
Load Capacitance	≤ 0.5 μF	≤ 0.5 μF	≤ 0.5 μF	≤ 0.5 μF	≤ 0.5 μF
Repeat Accuracy R	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
Ambient Temperature Range T _a	-40...+85 °C	-40...+85 °C	-40...+85 °C	-40...+85 °C	-25...+85 °C
Operating Frequency f	≤ 3000 Hz	≤ 3000 Hz	≤ 1000 Hz	≤ 2000 Hz	≤ 2000 Hz
Function Indication	yes	yes	yes	yes	yes
Degree of Protection per IEC 60529	IP 68	IP 68	IP 68	IP 68	IP 68
Housing Material	stainless steel 303	stainless steel 303	stainless steel 303	stainless steel 303	stainless steel 303
Material of Sensing Face	PA12	PA12	LCP	LCP	LCP
Connection	cabl	connector	connector	connector	connector
No. of Wires x Gauge	3 x 22 AWG				
Approvals	cULus	cULus	cULus	cULus	cULus
Recommended Connector		C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M

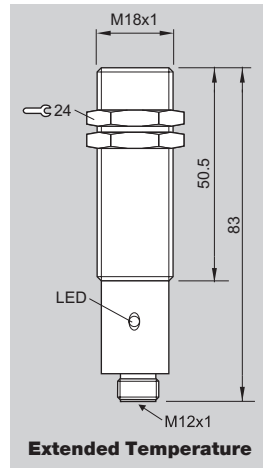
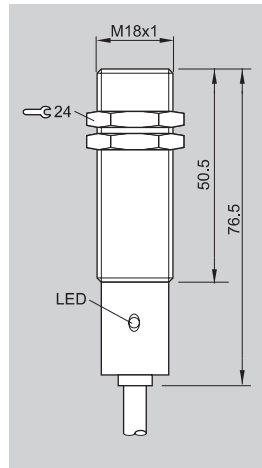
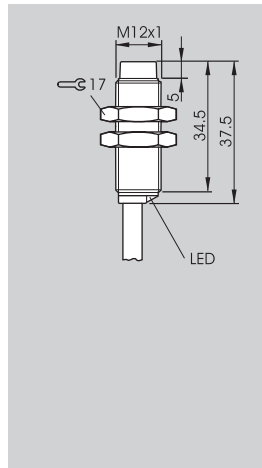
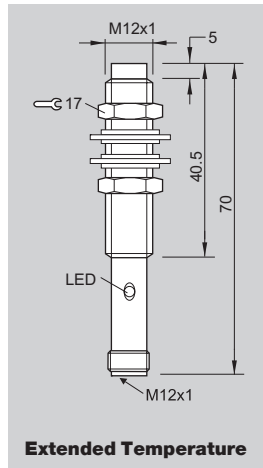
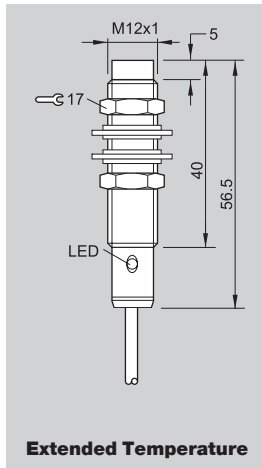
* See technical section for proper mounting of the 2x, 3x, and 4x long range sensors.

Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

Wiring Diagrams



M12x1 non-flush 4 mm 0...3.2 mm	M12x1 non-flush 4 mm 0...3.2 mm	M12x1 non-flush 4 mm 0...3.2 mm	M18x1 flush 5 mm 0...4.1 mm	M18x1 flush 5 mm 0...4.1 mm
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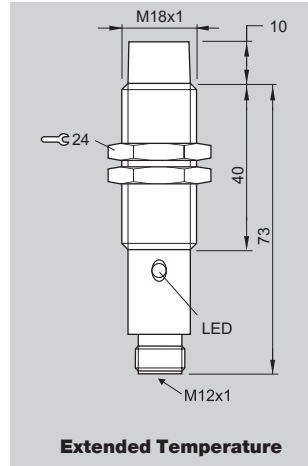
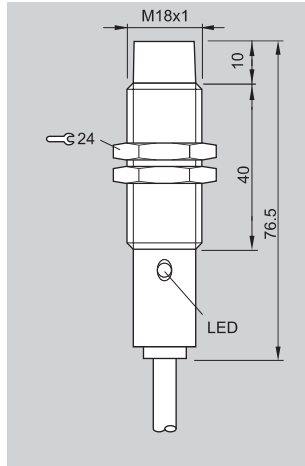
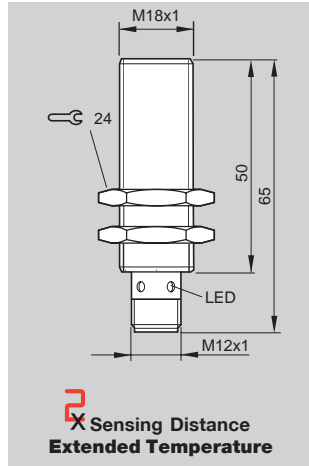


BES 515-356-BO-C-PU-05	BES 515-356-S4-C	BES 515-356-E4-C-03	BES 515-326-BO-C-PU-05	BES 515-326-S4-C
24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc
10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
typ. 1.5 V	typ. 1.5 V	≤ 2.0 V	≤ 2.5 V	≤ 2.5 V
250 Vac	250 Vac	250 Vdc	250 Vac	250 Vac
200 mA	200 mA	200 mA	200 mA	200 mA
≤ 8 mA/ ≤ 1 mA	≤ 8 mA/ ≤ 1 mA	≤ 10 mA	≤ 25 mA/ ≤ 12 mA	≤ 25 mA/ ≤ 12 mA
≤ 50 μA	≤ 50 μA	≤ 30 μA	≤ 80 μA	≤ 80 μA
yes	yes	yes	yes	yes
yes	yes	yes	yes	yes
≤ 0.5 μF	≤ 0.5 μF	≤ 0.5 μF	≤ 1.0 μF	≤ 1.0 μF
≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
-40...+85 °C	-40...+85 °C	-25...+70 °C	-25...+70 °C	-40...+85 °C
≤ 1500 Hz	≤ 1500 Hz	≤ 2000 Hz	≤ 900 Hz	≤ 900 Hz
yes	yes	yes	yes	yes
IP 68	IP 68	IP 68	IP 68	IP 68
stainless steel 303	stainless steel 303	stainless steel 303	stainless steel 303	stainless steel 303
PA12	PA12	PBT	PA12	PA12
cable	connector	cable	cable	connector
3 × 22 AWG		3 × 22 AWG	3 × 22 AWG	
cULus	cULus	cULus	cULus	cULus
	C04 AEL-00-VY-050M			C04 AEL-00-VY-050M



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

Housing size	M18x1	M18x1	M18x1
Mounting	flush*	non-flush	non-flush
Rated operating distance s _n	8 mm	8 mm	8 mm
Assured operating distance s _a	0...6.5 mm	0...6.5 mm	0...6.5 mm



PNP	Normally-open ①	BES M18EI-PSC80B-S04G	BES 515-360-BO-C-PU-03	BES 515-360-S4-C
	Normally-closed ②	BES M18EI-POC80B-S04G		
	Complementary ③			BES 515-123-S4-C

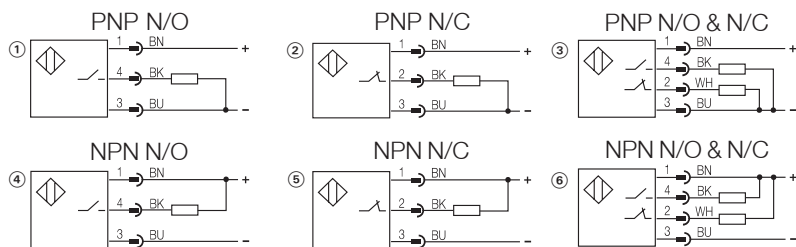
NPN	Normally-open ④	BES M18EI-NSC80B-S04G		
	Normally-closed ⑤	BES M18EI-NOC80B-S04G		

Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	10...30 Vdc
Voltage Drop U _d at I _e	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
Rated Insulation Voltage U _i	250 Vac	250 Vac	250 Vac
Rated Operational Current I _e	200 mA	200 mA	200 mA
No-load Supply Current I ₀ d./und.	≤ 10 mA	≤ 25 mA/ ≤ 12 mA	≤ 25 mA/ ≤ 12 mA
Off-state Current I _f	≤ 10 μA	≤ 80 μA	≤ 80 μA
Protected Against Polarity Reversal	yes	yes	yes
Short circuit Protected	yes	yes	yes
Load Capacity	≤ 0.5 μF	≤ 1.0 μF	≤ 1.0 μF

Repeat Accuracy R	≤ 5 %	≤ 5 %	≤ 5 %
Ambient Temperature Range T _a	-40...+85 °C	-25...+70 °C	-40...+85 °C
Operating Frequency f	≤ 700 Hz	≤ 600 Hz	≤ 600 Hz
Function Indication	yes	yes	yes
Degree of Protection per IEC 60529	IP 68	IP 68	IP 68
Housing Material	stainless steel 303	stainless steel 303	stainless steel 303
Material of Sensing Face	PBT	PA12	PA12
Connection	connector	cable	connector
No. of Wires x Gauge		3 x 22 AWG	
Approvals	cULus	cULus	cULus
Recommended Connector	C04 AEL-00-VY-050M		C04 AEL-00-VY-050M

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

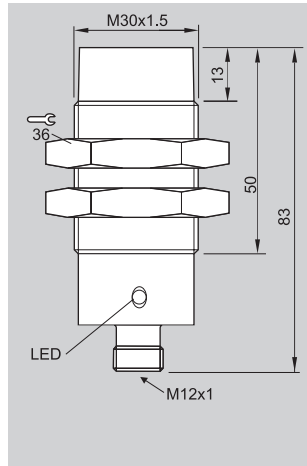
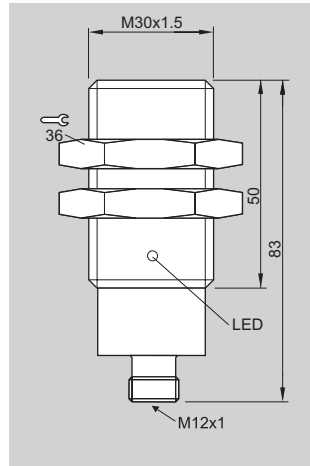
Wiring Diagrams



Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

M30x1.5
flush
10 mm
0...8.1 mm

M30x1.5
non-flush
15 mm
0...12.2 mm



BES 515-327-S4-C

BES 515-362-S4-C

24 Vdc
10...30 Vdc
≤ 2.5 V
250 Vac
200 mA
≤ 25 mV ≤ 12 mA
≤ 80 µA
yes
yes
≤ 1.0 µF
≤ 5 %
-25...+70 °C
≤ 300 Hz
yes
IP 68
stainless steel 303
PA12
connector
cULus
C04 AEL-00-VY-050M

24 Vdc
10...30 Vdc
≤ 2.5 V
250 Vac
200 mA
≤ 25 mV ≤ 12 mA
≤ 80 µA
yes
yes
≤ 1.0 µF
≤ 5 %
-25...+70 °C
≤ 100 Hz
yes
IP 68
stainless steel 303
PA12
connector
cULus
C04 AEL-00-VY-050M



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

- Contents
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- Part Numbers
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 - DC 3-Wire
 - DC 2-Wire
 - SteelFace®
 - 2x
 - 3x
 - Fe/NFe
 - Welding
 - Factor 1
 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories

- 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
 - DC 2-Wire Block

- Specialty
 - SuperShorties™
 - Proxinox® High Temp
 - Analog
 - Large Housing
 - Ring Sensor

6 Connectors

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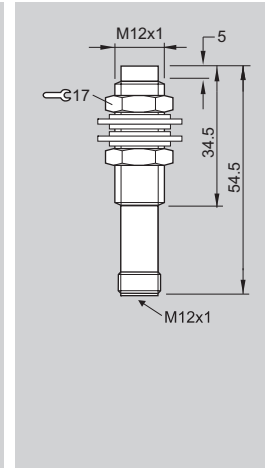
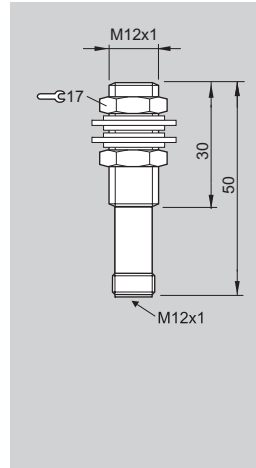
PROXINOX® Sensors Harsh Environment

PROXINOX® Harsh Environment sensors share many of the same features of the standard PROXINOX line but are designed for use in even harsher environments. Many industries have the need to routinely clean with aggressive cleaning agents. Standard sensors are not designed to withstand this type of abuse. Whether acids, bases, steam or high pressure cleaning, the PROXINOX Harsh Environment sensors can withstand the most demanding conditions.

Non-LED sensor features:

- Sensor bodies are double insulated to VDE 0110 and cULus 2097 specifications. They have plastic inner sleeves encapsulated by stainless steel outer housings. The housings are Stainless Steel 316 Ti, which meets the most demanding specifications of the dairy industry and the food and beverage industry.
- Non-LED means increased protection. The LED hole is eliminated to prevent contaminant buildup in a food environment and to make the housing increasingly resistant to chemical and water ingress where high pressure cleaning is used. This design creates a sensor rated for unique IP 69K applications.
- Gold plated contacts are used to prevent corrosion in harsh chemical environments.
- O-ring seals are provided internally to ensure a contamination proof seal. This O-ring allows for contraction and expansion during various cleaning processes ensuring the integrity of the sensor. In addition, the insulation sleeves and the special end caps made of PEEK also help keep out chemicals and resist deterioration.
- Part numbers are laser etched so that no label is present to be destroyed or fall off.
- SMD technology protects the sensors from short circuits and polarity reversal.

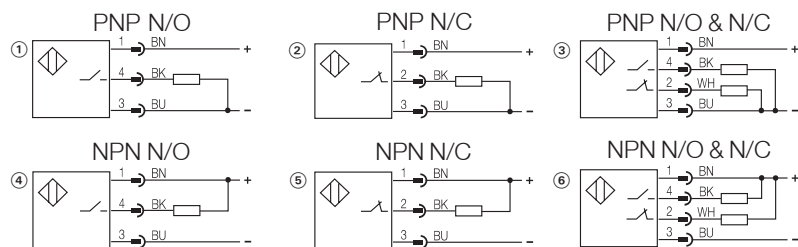
Housing Size	M12x1	M12x1
Mounting	flush	non-flush
Rated Operating Distance s _n	2 mm	4 mm
Assured Operating Distance s _a	0...1.6 mm	0...3.2 mm

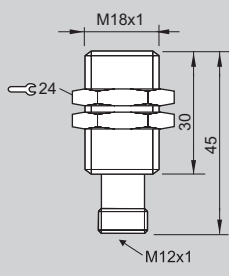
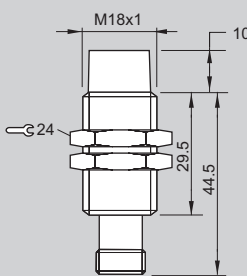
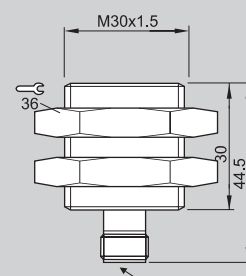


PNP	Normally-open ① Normally-closed ②	BES 515-325-E5-T-S4	BES 515-356-E5-T-S4
Rated Operational Voltage U _e		24 Vdc	24 Vdc
Supply Voltage U _B		10...30 Vdc	10...30 Vdc
Voltage Drop U _d at I _e		≤ 3.5 V	≤ 3.5 V
Rated Insulation Voltage U _i		75 Vdc	75 Vdc
Rated Operational Current I _e		130 mA	130 mA
No-load Supply Current I ₀ d./und.		≤ 25 mA/ ≤ 12 mA	≤ 25 mA/ ≤ 12 mA
Off-state Current I _r		≤ 80 μA	≤ 80 μA
Protected Against Polarity Reversal		yes	yes
Short Circuit Protected		yes	yes
Load Capacity		≤ 1.0 μF	≤ 1.0 μF
Repeat Accuracy R		≤ 5 %	≤ 5 %
Ambient Temperature Range T _a		-40...+105 °C	-40...+105 °C
Operating Frequency f		≤ 800 Hz	≤ 400 Hz
Function Indication		no	no
Degree of Protection per IEC 60529		IP 69K	IP 69K
Housing Material		316 Ti	316 Ti
Material of Sensing Face		PEEK	PEEK
Connection		connector	connector
No. of Wires × Gauge			
Approvals		cULus	cULus
Recommended Connector (IP 69K)		BKS-S260-3-05	BKS-S260-3-05

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

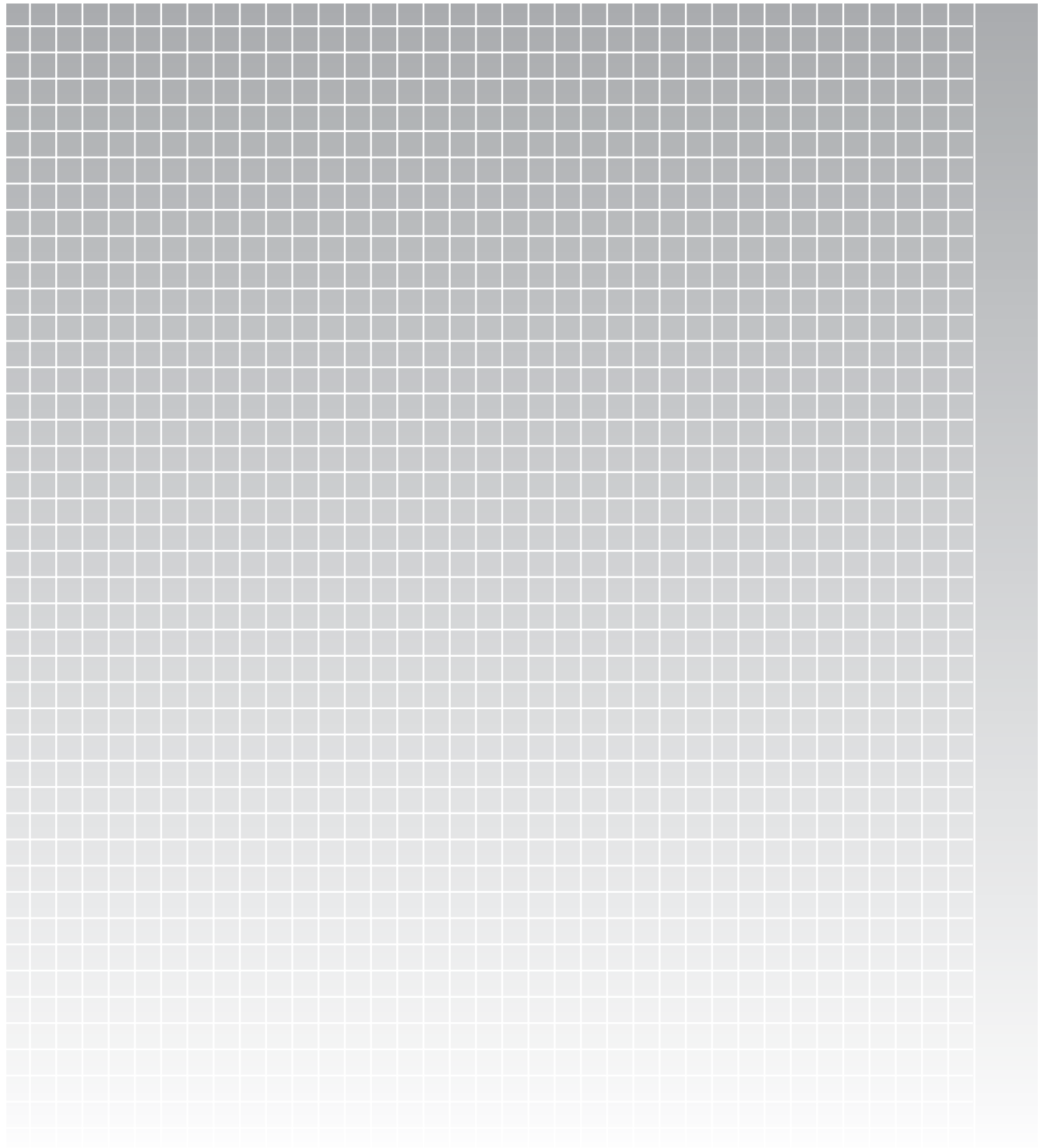
Wiring Diagrams



M18x1 flush 5 mm 0...4.1 mm	M18x1 non-flush 8 mm 0...6.5 mm	M30 x 1.5 flush 10 mm 0...8.0 mm
		
BES 515-326-E5-T-S4	BES 515-360-E5-T-S4	BES 515-327-E5-T-S4
24 Vdc	24 Vdc	24 Vdc
10...30 Vdc	10...30 Vdc	10...30 Vdc
≤ 3.5 V	≤ 3.5 V	≤ 3.5 V
75 Vdc	75 Vdc	75 Vdc
130 mA	130 mA	130 mA
≤ 25 mV ≤ 12 mA	≤ 25 mV ≤ 12 mA	≤ 20 mA
≤ 80 μA	≤ 80 μA	≤ 80 μA
yes	yes	yes
yes	yes	yes
≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF
≤ 5 %	≤ 5 %	≤ 5 %
-40...+105 °C	-40...+105 °C	-40...+105 °C
≤ 500 Hz	≤ 200 Hz	≤ 200 Hz
no	no	no
IP 69K	IP 69K	IP 69K
316 Ti	316 Ti	316 Ti
PA 12	PA 12	PA 12
connector	connector	connector
cULus	cULus	cULus
BKS-S260-3-05	BKS-S260-3-05	BKS-S260-3-05



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

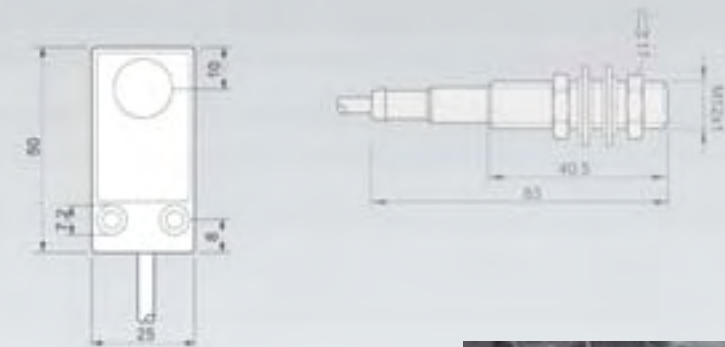


High Temperature Sensors

Glass molding applications require high temperature tolerance due to the high radiant heat of the liquid glass. Many industrial processes require baking in curing ovens. For these and similar applications, where reliable sensor function at high ambient temperatures is required, Balluff offers High Temperature Rated Sensors. Capable of operating in ambient temperatures from -25 to up to +120°C (+248°F), Balluff high temperature sensors meet IP 67 (NEMA 4, 4x, 6, 12, 13) protection requirements, and can be used in any application where non-contact detection must be accomplished at high temperatures.

1.154 DC 3-/4-Wire M5, M8

1.155 DC 3-/4-Wire M12, M18



Contents

Selection Charts

Part Numbers

Featured

GlobalProx®
– DC 3-Wire
– DC 2-Wire

SteelFace®
– 2x
– 3x
– Fe/NFe

Welding
– Factor 1
– Weld Field Immune
– SlagMaster®
– Welding Accessories

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

DC 2-Wire Block

Specialty

SuperShorties™
Proxinox®
High Temp
Analog
Large Housing
Ring Sensor

6 Connectors

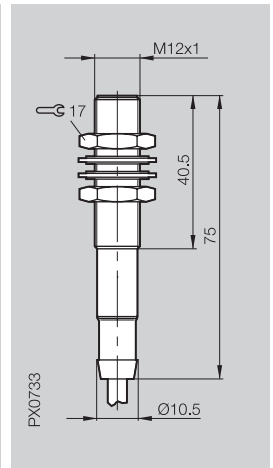
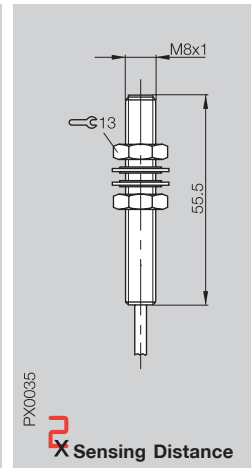
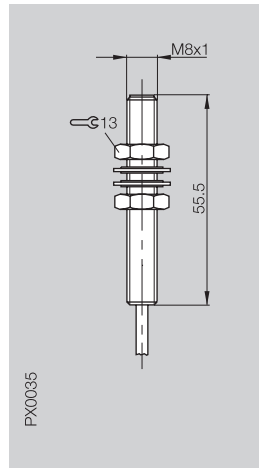
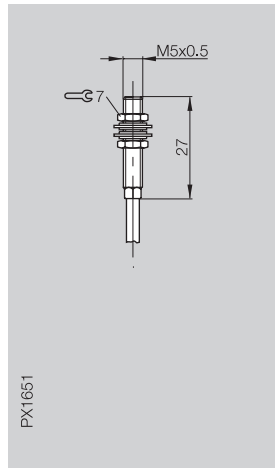
7 Accessories

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Housing size	M5×0.5	M8×1	M8×1	M12×1
Mounting	flush	flush	flush*	flush
Rated operating distance s _n	0.5 mm	1 mm	2 mm	2 mm
Assured operating distance s _a	0...0.4 mm	0...0.8 mm	0...1.6 mm	0...1.6 mm



PNP	Normally-open ① Complimentary ③	BESM05ED-PSD05B-ES02-T01	BES 516-324-SA8-02	BES 516-324-SA26-02	BES 516-325-SA19-03
NPN	Normally-open ④ Complimentary ⑥				BES 516-329-SA14-A0-X-03

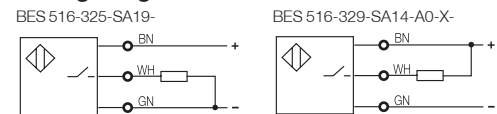
Rated Operational Voltage V _c	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
Voltage Drop U _d at I _e	≤ 1 V	≤ 1.5 V	≤ 1.5 V	PNP ≤ 1.8 V, NPN ≤ 1.5 V
Rated Insulation Voltage U _i	75 Vdc	75 Vdc	75 Vdc	75 Vdc
Rated Operational Current I _e	≤ 150 mA (see Fig. 1)	≤ 200 mA (see Fig. 2)	≤ 200 mA (see Fig. 3)	≤ 200 mA (see Fig. 3)
No-load Supply Current I ₀ max.	≤ 10 mA	≤ 20 mA	≤ 20 mA	≤ 25 mA
Polarity Reversal Protected	yes	yes	yes	yes
Short Circuit Protected	yes	no	no	no
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...+120 °C	-25...+100 °C	-25...+120 °C	-25...+120 °C
Switching Frequency f	1000 Hz	2000 Hz	1500 Hz	1000 Hz
Function Indicator	no	no	no	no

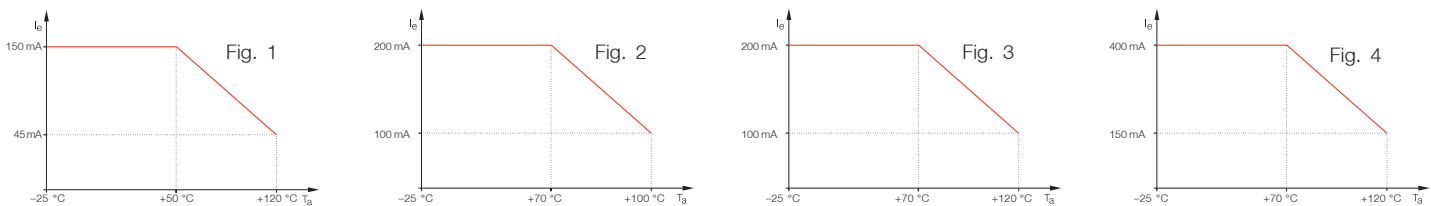
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67, IP 60 cable exit	IP 68 per BWN Pr. 20, IP 60 cable exit
Housing Material	Stainless steel	Stainless steel	Stainless steel	Nickel plated brass
Material of Sensing Face	PA 6	PBT	PBT	PEEK
Connection	Silicon cable	PVC/105 °C cable	PTFE cable	Silicon cable
No. of Wires × Gauge	3×26 AWG	3×26 AWG	3×26 AWG	3×20 AWG
Recommended Connector				
Pressure Rated to				3 bar

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

Wiring Diagrams



Current reduction as a function of ambient temperature range



High Temperature

Inductive Sensors

DC 3-/4-Wire
M18, M30, 20x50x10
S_n 5 mm, 10 mm, 15 mm

M18x1 flush 5 mm 0...4.1 mm	M18x1 flush 5 mm 0...4.1 mm	M30x1.5 flush 10 mm 0...8.1 mm	M30x1.5 non-flush 15 mm 0...12.2 mm	25x50x10 mm flush 5 mm 0...4.1 mm
BES 516-105-SA5	BES 516-105-SA2-05	BES 516-114-SA1-05	BES 516-125-SA1-05	BES 516-347-SA2-05
		BES 516-120-SA2		
24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vcd
10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc	24 Vcd ±10 %
≤ 1.5 V	≤ 1.5 V	≤ 1.5 V	≤ 1.5 V	≤ 2.5 V
75 Vdc	75 Vdc	75 Vdc	75 Vdc	75 V DC
≤ 400 mA (see Fig. 4)	≤ 400 mA (see Fig. 4)	≤ 400 mA (see Fig. 4)	≤ 400 mA (see Fig. 4)	≤ 25 mA
≤ 20 mA	≤ 20 mA	≤ 15 mA	≤ 15 mA	≤ 25 mA
yes	yes	yes	yes	yes
no	no	no	no	yes
1.0 μF	1.0 μF	1.0 μF	1.0 μF	1.0 μF
≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
-25...+120 °C	-25...+120 °C	-25...+120 °C	-25...+120 °C	-25...+100 °C
500 Hz	500 Hz	300 Hz	100 Hz	500 Hz
no	no	no	no	no
IP 67	IP 67, IP 60 cable exit	IP 67, IP 60 cable exit	IP 67, IP 60 cable exit	IP 65, IP 60 cable exit
Nickel plated brass	Nickel plated brass	Nickel plated brass	Nickel plated brass	GD-AI
PBT	PBT	PBT	PA 12	PBT
Connector	Silicon cable	Silicon cable	Silicon cable	Silicon cable
	4x18 AWG	4x18 AWG	4x18 AWG	3x18 AWG
C04 AEL-00-TY-050M				

Inductive

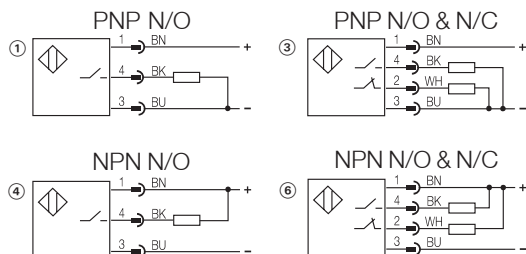
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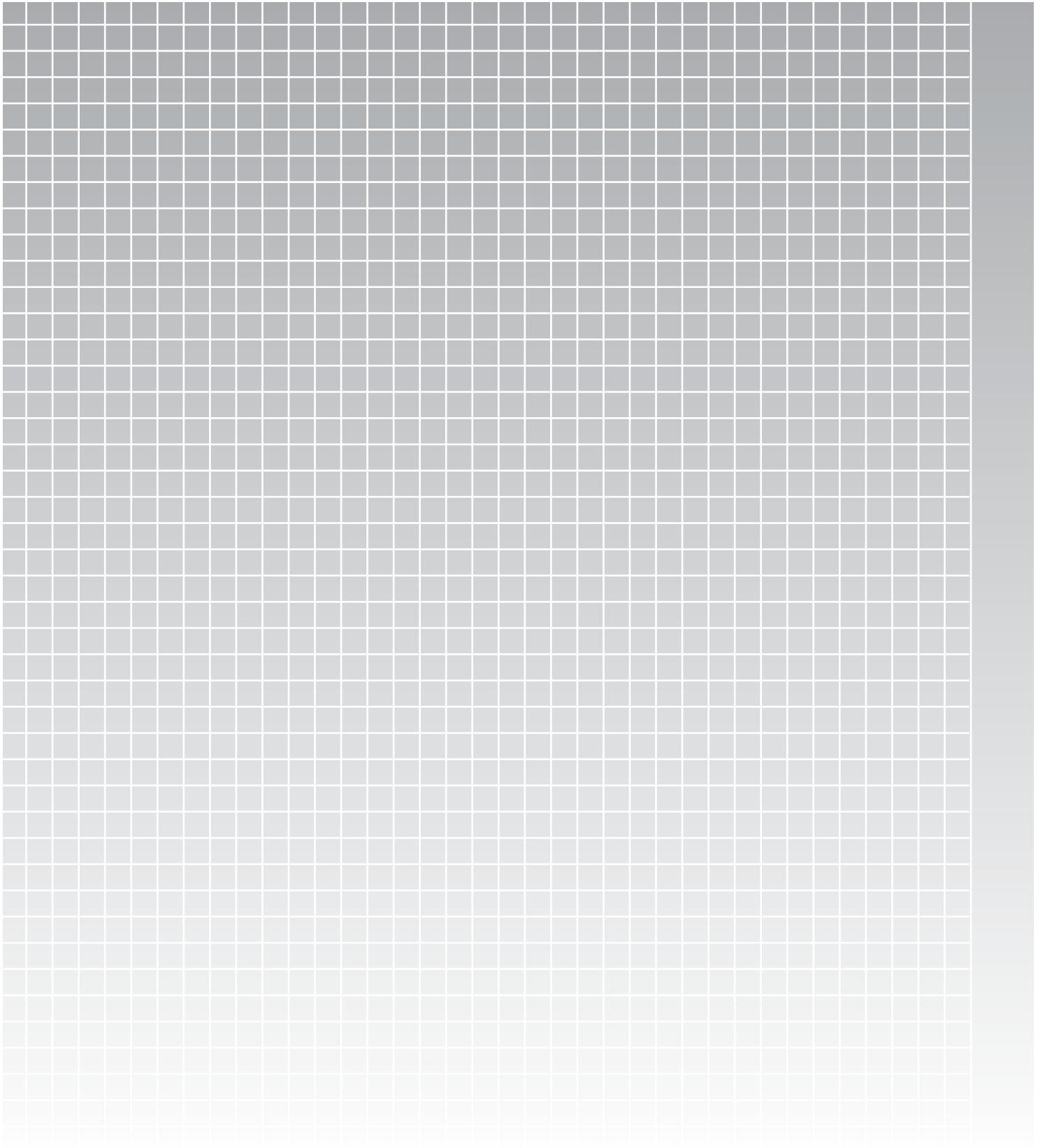
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 - SteelFace®
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 - Fe/NFe
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 - Factor 1
 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories

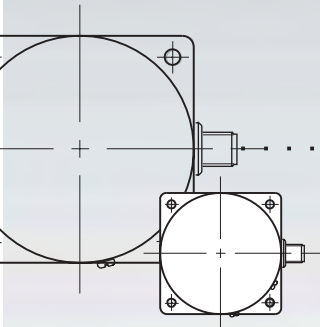
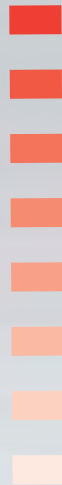
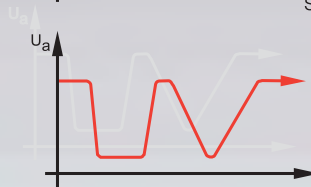
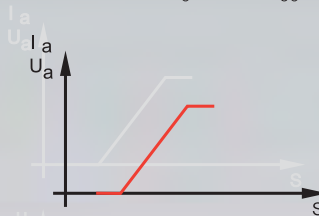
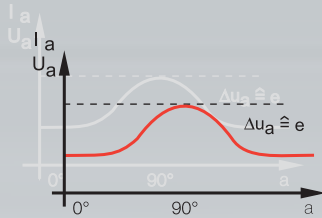
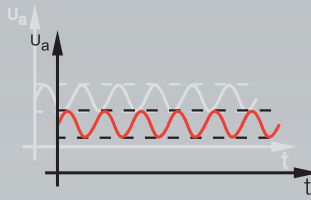
- Standard
 - DC 3-/4-Wire Tubular
 - DC 3-/4-Wire Block
 - AC 2-Wire Tubular
 - AC/DC 2-Wire Tubular
 - AC/DC 2-Wire Block
 - DC 2-Wire Tubular
 - DC 2-Wire Block
- Specialty
 - SuperShorties™
 - Proxinox™
 - High Temp**
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 - Ring Sensor

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Wiring Diagrams







Analog Inductive Sensors

Ideal for applications involving relatively short travel of metal targets, Balluff analog inductive sensors provide precision non-contact position measurement in an affordable family of compact housings. Analog inductive sensors are simple three-wire devices that operate on 24V DC. They provide an electrical output signal that varies linearly in proportion to the position of a metal target within their working range. The analog output signal is available in either voltage or current.

Highlighted Features

- Extended linear measuring range
- Internal signal linearization performed entirely within the analog domain, preserving the extremely fine resolution of the pure analog signal
- Reduced output signal temperature drift due to temperature-compensating ASIC
- Post-assembly calibration to compensate for variance in manufacturing tolerances

- 1.159** BAW with digital output
- 1.160** Analog Sensors Ø 6.5mm, M8
- 1.161** Analog Sensors M12
- 1.162** Analog Sensors M8
- 1.163** Analog Sensors M18
- 1.165** Analog Sensors M18, M30, PG 36
- 1.166** Analog Sensors 20x30x8, 80x80x40
- 1.167** Analog Sensors 10x30x6
- 1.168** Set Point Controller
- 1.169** M18

Contents

Selection Charts

Part Numbers

Featured

GlobalProx®
– DC 3-Wire
– DC 2-Wire

SteelFace®
– 2x
– 3x
– Fe/NFe

Welding
– Factor 1
– Weld Field Immune
– SlagMaster®
– Welding Accessories

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

DC 2-Wire Block

Specialty

SuperShorties™
Proxinox®
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Application examples:

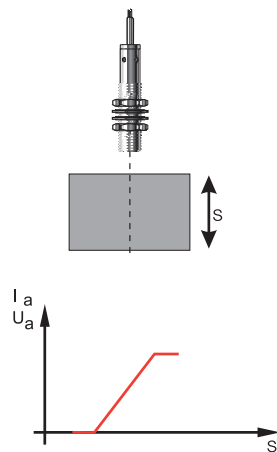
Some of the numerous applications in measuring and controlling include:

- Distance measurement
- Thickness measurement
- Run-off measurement
- Belt/band width measurement
- Detection of surface waves
- Counting
- Positioning
- Position monitoring
- Selection of parts of various sizes and materials

Features:

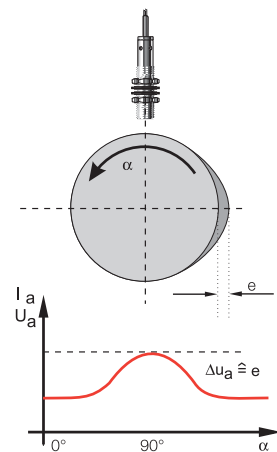
- Distance-proportional analog signal
- Housing sizes $\varnothing 6.5 \dots 80 \times 80$
- Sensing ranges 1...50 mm
- Non-contact, absolute operating principle
- High repeat accuracy
- Low temperature drift
- LED for setup aid
- Compact, sealed, rugged and reliable

Axial approach



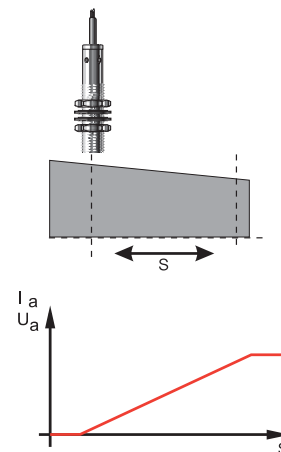
Distance changes in the sensor axis result in proportionally changing output signals.

Sensing a rotating object



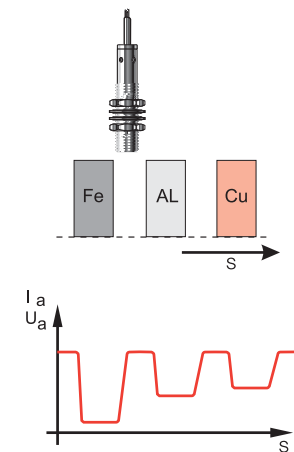
Eccentric cams, lobes or imbalances result in a periodic change of the output signal.

Lateral approach



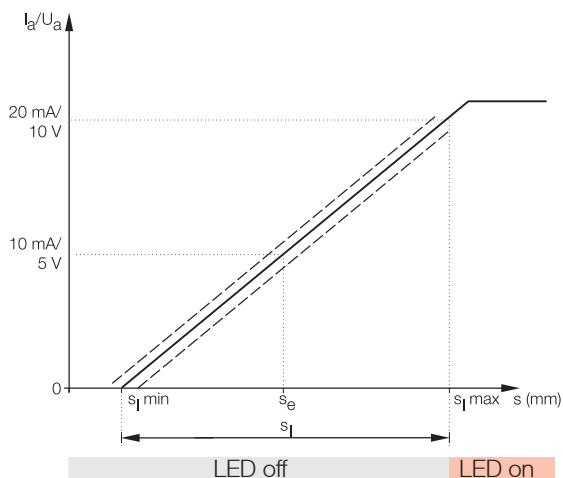
Detecting larger travel by sensing an inclined surface.

Sensing various materials



With the distance constant, the output signal will change only when the object material changes.

Approach curve



Resolution Application Notes:

1. BAW sensors are a pure analog device with theoretically infinite resolution.
2. Application resolution depends on ambient electrical noise level.
3. Typical industrial application noise level is 10-15mV.
4. If application level noise proves troublesome, a connectorized model and shielded cordset are recommended.

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 - DC 2-Wire
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 - 2x
 - 3x
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 - Welding Accessories

- 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
- DC 2-Wire Block
- Specialty

- SuperShorties™
- Proxinox®
- High Temp
- Analog
- Large Housing
- Ring Sensor
- 6 Connectors
- 7 Accessories
- Product Overview
- Technical Reference
- Part Number Index

Analog inductive sensor with digital interface and temperature output.

Do you require analog position sensing with digital processing?

Do you need to accomplish this without an external processing device?

Then Balluff has a solution for your automation needs.

Our analog inductive sensor with digital interface provides a 0...10 V analog output as well as a 4 bit, BCD coded digital output.

The working range (1...5mm) of the sensor can be divided into a maximum of 14 equal sub-ranges.

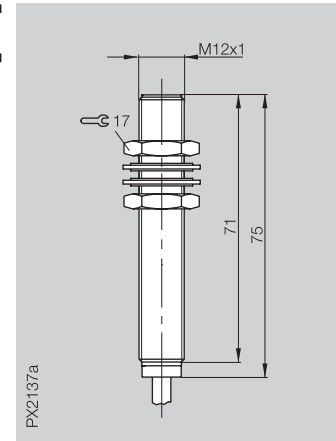
When the target goes outside the set working range, it recognizes this by means of the "Out of Range" function. When a target comes closer than 1mm to the sensor face this is represented by an output bit pattern 0000. When a target is beyond the 5 mm working range of the sensor this is represented by a bit pattern 1111.

Ambient temperature compensation

The accuracy of the Balluff BAW sensors is due, among other things, to the fact that Balluff measures the ambient temperature in the sensor and compensates for changes before generating the output signal.

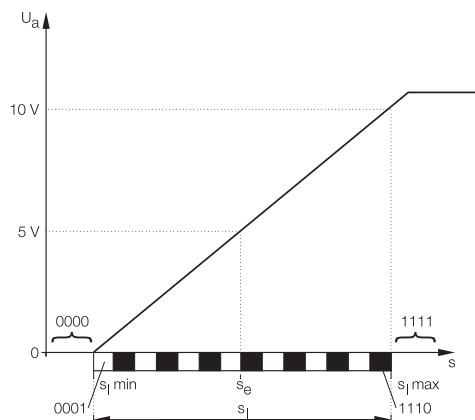
A separate temperature output signal is also provided from the sensor. This value changes with high linearity by -9mV/K.

Housing size, Mounting	M12x1, flush
Output Signal	Analog
	Digital
Linear Range s_i	1...5 mm

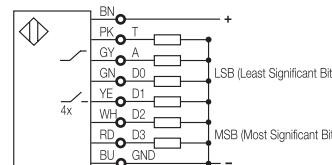


Ordering Code	BAW M12MP-UAZ50B-BV03-510
Rated Operational Voltage U_e	24 V DC
Supply Voltage U_B	15...30 V DC
Ripple	≤ 15% of U_e
Rated Sensing Distance s_e	3 mm
Load Resistance R_L	≥ 5 kW
No-load Supply Current I_0 at U_e	≤ 20 mA
Protected Against Polarity Reversal	yes
Short Circuit Protected	yes
Ambient Temperature Range T_a	-10...+70 °C
Repeat Accuracy R_{BWN}	±8 μm
Non-linearity	≤ ±120 μm
Limit Frequency (-3dB)	500 Hz
Measuring Speed	≤ 30 m/s
Response Time	1 ms
Temperature coefficient TK	Typical -1.5 μm/K
in the optimal range	Min. 0 μm/K
from +10...+50 °C	Max. 5 μm/K
Degree of Protection per IEC 60529	IP 67
Housing Material	CuZn nickel plated
Sensing Face Material	LCP
Connection	cable, PVC
No. of Wires x Gauge	8x26 AWG

Characteristic Output Curve



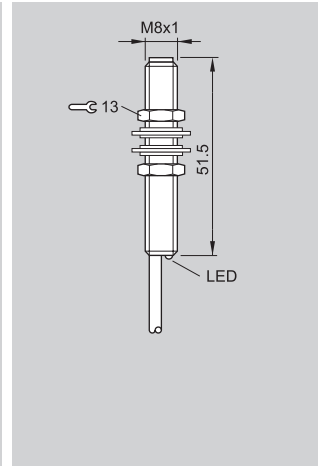
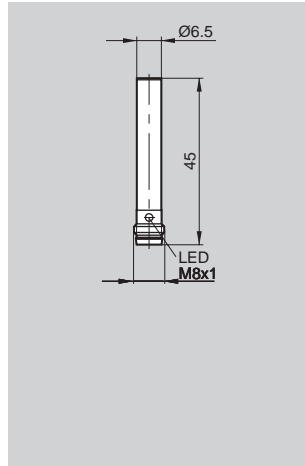
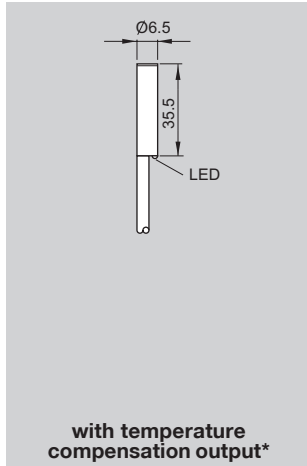
Wiring diagram



A = Analog output
T = Temperature output



Housing Size	Ø 6.5 mm	Ø 6.5 mm	M8x1
Mounting	flush	flush	flush
Output Signal	0...10 V	0...10 V	0...10 V
Linear Range s _L	0.5...2 mm	0.5...2 mm	0.5...1.5 mm



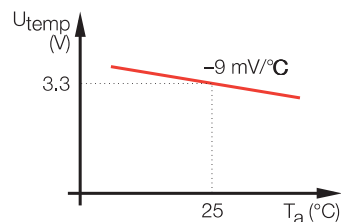
Voltage Output, 0 - 10V	BAW G06EE-UAF20B-EP03-K	BAW G06EF-UAC20B-S49G	BAW M08EI-UAD15B-BP05
Current Output, 0 - 20mA			
Current Output, 4 - 20mA			

Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	21.6...26.4 Vdc	15...30 Vdc	15...30 Vdc
Supply Voltage Ripple, max. 15% of U _e	≤ 2.4 Vdc @ 24 Vdc	≤ 2.4 Vdc @ 24 Vdc	≤ 3.60 Vdc @ 24 Vdc
No-load Supply Current I ₀ @ U _e	≤ 15.0 mA	≤ 10.0 mA	≤ 8.0 mA
Linear Span s _L ¹	1.25 mm	1.25 mm	1.00 mm
Midpoint of Linear Range s _e ²	1.25 ± 0.1 mm	1.25 ± 0.1 mm	1.00 ± 0.1 mm
Resolution Voltage Output	Infinite ³	Infinite ³	Infinite ³
Resolution Current Output	–	–	–
Non-linearity ⁴	≤ 0.0375 mm	≤ 0.0375 mm	≤ 0.03 mm
Repeatability ⁵	≤ 0.0375 mm	≤ 0.0375 mm	≤ 0.03 mm
Temperature Drift ⁶ (+15...55 °C)			0.00025 mm/°C
Ambient Temperature range T _a	+10...+60 °C	+10...+50 °C	-10...+70 °C
Cutoff Frequency (-3 dB output amplitude)	1000 Hz	1000 Hz	1000 Hz
Time delay before availability t _v	≤ 1.0 ms	≤ 1.0 ms	≤ 1.0 ms
Load Resistance R _L	≥ 5 kΩ	≥ 5 kΩ	≥ 2 kΩ
Rated Insulation Voltage U _i	250 Vdc	250 Vdc	250 Vac
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67
Housing Material	stainless steel	stainless steel	stainless steel
Sensing Face Material	PBTP	PBTP	PBTP
No. Wires x Gauge	4 x 26 AWG		3 x 26 AWG
Connection	cable	connector	cable
Linear range display (LED ON when out of range)	no	no	no
Short Circuit/Overload Protected	no	no	yes
Protected Against Polarity Reversal	no	no	yes
Recommended Connector (non-shielded)		C49 ANE-00-VY-050M	
Recommended Connector (shielded)		BKS S75-14-03	

Notes

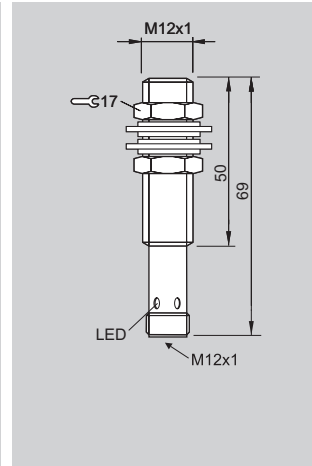
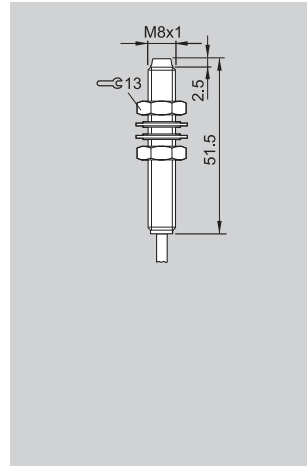
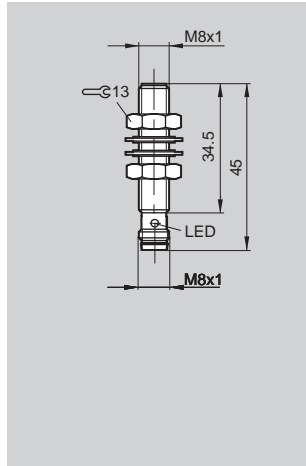
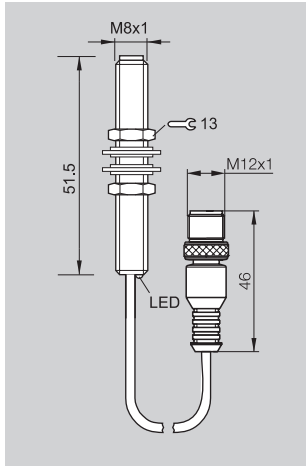
1. Size of the linear sensing window
2. Midpoint with tolerance, sensor to sensor
3. See resolution note page 1.158
4. Deviation over the linear span, 3% of full scale
5. Ability to repeat output level for a given target distance, 3% of full scale
6. Deviation relative to 25°C ambient temperature as a percent of full scale:
 - +15...55°C = 1%
 - +10...60°C = 2.5%
 - +10...70°C = 5%

***Temperature Output Signal**



Sensors with a temperature output indicate precisely the change in measured temperature.

M8x1	M8x1	M8x1	M12x1
flush	flush	non-flush	flush
0...10 V	0...10 V	0...10 V	0...10 V
0.5...1.5 mm	0.5...1.5 mm	0.5...2.5 mm	0.5...2 mm



BAW M08EI-UAD15B-BP00,2-GS04

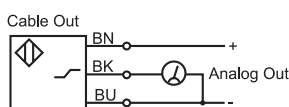
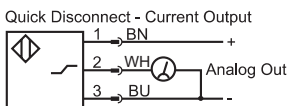
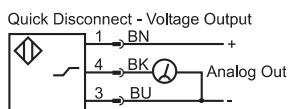
BAW M08F-UAC15B-S49G

BAW M08EI-UAD25F-BP03

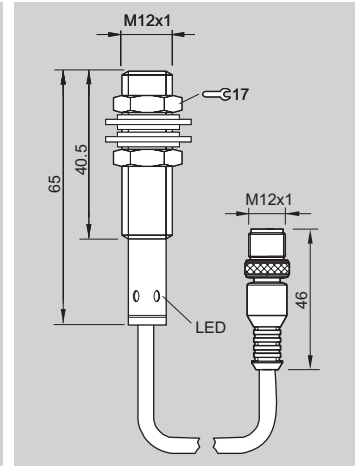
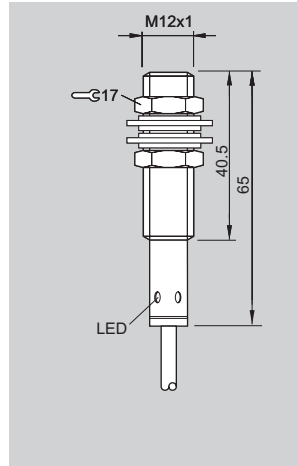
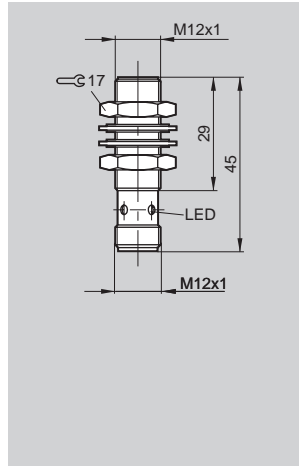
BAW M12MI-UAC20B-S04G

24 Vdc	24 Vdc	24 Vdc	24 Vdc
15...30 Vdc	15...30 Vdc	15...30 Vdc	15...30 Vdc
≤ 3.60 Vdc @ 24 Vdc	≤ 15%	≤ 15%	≤ 3.60 Vdc @ 24 Vdc
≤ 8.0 mA	≤ 8.0 mA	≤ 8.0 mA	≤ 10.0 mA
1.00 mm	1.00 mm	2.00 mm	1.50 mm
1.00 ± 0.1 mm	1.00 ± 0.1 mm	1.50 ± 0.1 mm	1.25 ± 0.125 mm
Infinite ³	Infinite ³	Infinite ³	Infinite ³
-	-	-	-
≤ 0.03 mm	≤ 0.03 mm	≤ 0.03 mm	≤ 0.045 mm
≤ 0.03 mm	≤ 0.03 mm	≤ 0.03 mm	≤ 0.045 mm
0.00025 mm/°C	0.00025 mm/°C	0.00025 mm/°C	0.000375 mm/°C
-10...+70 °C	-10...+70 °C	-10...+70 °C	-10...+70 °C
1000 Hz	1000 Hz	1000 Hz	500 Hz
≤ 1.0 ms	≤ 1.0 ms	≤ 1.0 ms	≤ 1.0 ms
≥ 2 kΩ	≥ 2 kΩ	≥ 2 kΩ	≥ 2 kΩ
250 Vac	250 Vac	250 Vac	250 Vac
IP 67	IP 67	IP 67	IP 67
stainless steel	stainless steel	stainless steel	nickel plated brass
PBTP	PBTP	PBTP	PA 12
cable with connector	connector	cable	connector
no	no	no	yes
yes	yes	yes	yes
yes	yes	yes	yes
C04 AEL-00-VY-050M	C49 ANE-00-VY-050M		C04 AEL-00-VY-050M
C04 ANL-00-PG-050M	BKS S75-14-03		C04 ANL-00-PG-050MS

Wiring Diagrams



Housing Size	M12x1	M12x1	M12x1
Mounting	flush	flush	flush
Output Signal	0...10 V	0...10 V, 0-20 mA	0...10 V, 0-20 mA
Linear Range s _L	0.5...2 mm	0.5...2 mm	0.5...2 mm

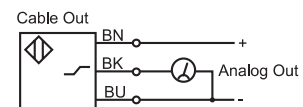
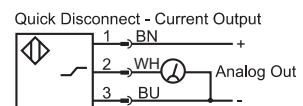
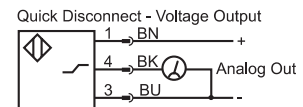


Voltage Output, 0 - 10V	BAW M12ME-UAC20B-S04G	BAW M12MG2-UAC20B-BP05	BAW M12MG2-UAC20B-BP00,2-GS04
Current Output, 0 - 20mA		BAW M12MG2-IAC20B-BP05	BAW M12MG2-IAC20B-BP00,2-GS04
Current Output, 4 - 20mA		BAW M12MG2-ICC20B-BP05	BAW M12MG2-ICC20B-BP00,2-GS04
Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	15...30 Vdc	15...30 Vdc	15...30 Vdc
Supply Voltage Ripple, max. 15% of U _e	≤ 15	≤ 3.60 Vdc @ 24 Vdc	≤ 3.60 Vdc @ 24 Vdc
No-load Supply Current I ₀ @ U _e	≤ 10.0 mA	≤ 10.0 mA	≤ 10.0 mA
Linear Span s _L ¹	1.50 mm	1.50 mm	1.50 mm
Midpoint of Linear Range s ₀ ²	1.25 ± 0.125 mm	1.25 ± 0.125 mm	1.25 ± 0.125 mm
Resolution Voltage Output	Infinite ³	Infinite ³	Infinite ³
Resolution Current Output	-	Infinite ³	Infinite ³
Non-linearity ⁴	≤ 0.045 mm	≤ 0.045 mm	≤ 0.045 mm
Repeatability ⁵	≤ 0.045 mm	≤ 0.045 mm	≤ 0.045 mm
Temperature Drift ⁶ (+15...55 °C)	0.000375 mm/°C	0.000375 mm/°C	0.000375 mm/°C
Ambient Temperature Range T _a	-10...+50 °C	-10...+70 °C	-10...+70 °C
Cutoff Frequency (-3 dB output amplitude)	500 Hz	500 Hz	500 Hz
Time delay before availability t _v	≤ 1.0 ms	≤ 1.0 ms	≤ 1.0 ms
Load Resistance R _L	≥ 2 kΩ	≥ 2 kΩ	≥ 2 kΩ
Rated Insulation Voltage U _i	250 Vac	250 Vac	250 Vac
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67
Housing Material	nickel plated brass	nickel plated brass	nickel plated brass
Sensing Face Material	PA 12	PA 12	PA 12
No. Wires x Gauge		3 x 22 AWG	
Connection	connector	cable	cable with connector
Linear range display (LED ON when out of range)	yes	yes	yes
Short Circuit/Overload Protected	yes	yes	yes
Protected Against Polarity Reversal	yes	yes	yes
Recommended Connector (non-shielded)	C04 AEL-00-VY-050M		C04 AEL-00-VY-050M
Recommended Connector (shielded)	C04 ANL-00-PG-050MS		C04 ANL-00-PG-050MS

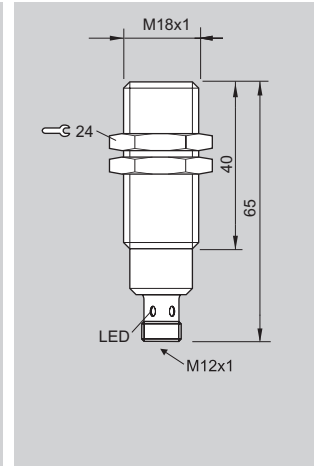
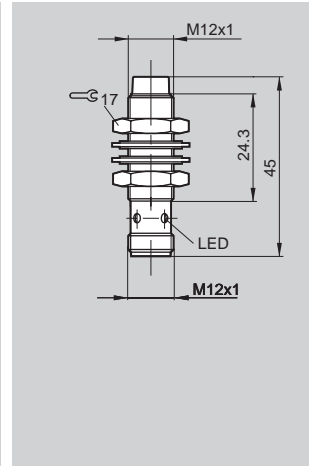
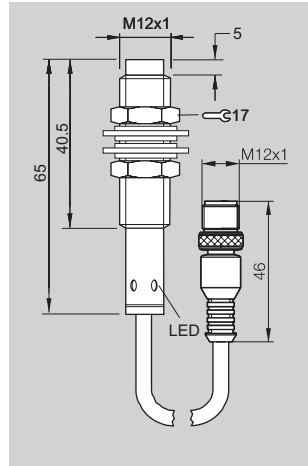
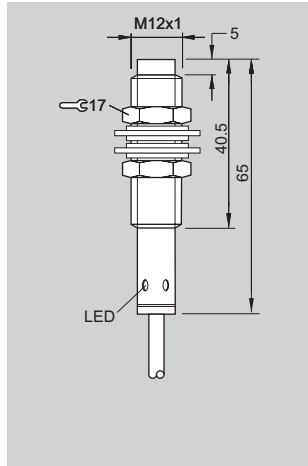
Notes

1. Size of the linear sensing window
2. Midpoint with tolerance, sensor to sensor
3. See resolution note page 1.158
4. Deviation over the linear span, 3% of full scale
5. Ability to repeat output level for a given target distance, 3% of full scale
6. Deviation relative to 25°C ambient temperature as a percent of full scale:
 - +15...55°C = 1%
 - +10...60°C = 2.5%
 - +10...70°C = 5%

Wiring Diagrams



M12x1	M12x1	M12x1	M18x1
non-flush	non-flush	non-flush	flush
0...10 V	0...10 V	0...10 V	0...10 V, 0-20 mA, 4-20 mA
1...4 mm	1...4 mm	1...4 mm	1...5 mm

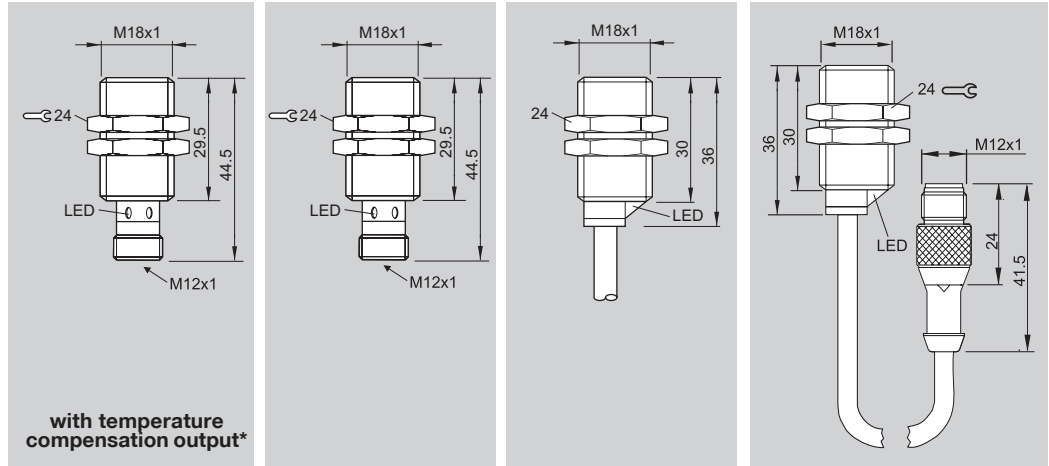


BAW M12MF2-UAC40F-BP05	BAW M12MF2-UAC40F-BP00,2-GS04	BAW M12MD-UAC40F-S04G	BAW M18MI-UAC50B-S04G
			BAW M18MI-IAC50B-S04G
			BAW M18MI-ICC50B-S04G

24 Vdc	24 Vdc	24 Vdc	24 Vdc
15...30 Vdc	15...30 Vdc	15...30 Vdc	15...30 Vdc
≤ 3.60 Vdc @ 24 Vdc	≤ 3.60 Vdc @ 24 Vdc	≤ 15%	≤ 3.60 Vdc @ 24 Vdc
≤ 10.0 mA	≤ 10.0 mA	≤ 10.0 mA	≤ 10.0 mA
3.00 mm	3.00 mm	3.00 mm	4.00 mm
1.25 ± 0.125 mm	1.25 ± 0.125 mm	1.25 ± 0.125 mm	3.00 ± 0.3 mm
Infinite ³	Infinite ³	Infinite ³	Infinite ³
-	-	-	Infinite ³
≤ 0.09 mm	≤ 0.09 mm	≤ 0.09 mm	≤ 0.12 mm
≤ 0.09 mm	≤ 0.09 mm	≤ 0.09 mm	≤ 0.12 mm
0.00075 mm/°C	0.00075 mm/°C	0.00075 mm/°C	0.001 mm/°C
-10...+70 °C	-10...+70 °C	-10...+70 °C	-10...+70 °C
500 Hz	500 Hz	500 Hz	500 Hz
≤ 1.0 ms	≤ 1.0 ms	≤ 1.0 ms	≤ 1.0 ms
≥ 2 kΩ	≥ 2 kΩ	≥ 2 kΩ	≥ 2 kΩ
250 Vac	250 Vac	250 Vac	75 Vdc
IP 67	IP 67	IP 67	IP 67
nickel plated brass	nickel plated brass	nickel plated brass	nickel plated brass
PBTP	PBTP	PBTP	PBTP
3 x 22 AWG			
cable	cable with connector	connector	connector
yes	yes	yes	yes
yes	yes	yes	yes
yes	yes	yes	yes
	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M
	C04 ANL-00-PG-050MS	C04 ANL-00-PG-050MS	C04 ANL-00-PG-050MS



Housing Size	M18x1	M18x1	M18x1	M18x1
Mounting	flush	flush	flush	flush
Output Signal	0...10 V	0...10 V	0...10 V	0...10 V
Linear Range s_L	1...5 mm	1...5 mm	1...5 mm	1...5 mm



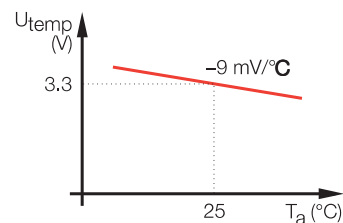
Voltage Output, 0 - 10V	BAW M18ME-UAE50B-S04G-K	BAW M18ME-UAC50B-S04G	BAW M18ME-UAC50B-BP05	BAW M18ME-UAC50B-BP00,2-GS04
Current Output, 0 - 20mA				
Current Output, 4 - 20mA				

Rated Operational Voltage U_o	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U_B	21.6...26.4 Vdc	15...30 Vdc	15...30 Vdc	15...30 Vdc
Supply Voltage Ripple, max. 15% of U_o	≤ 2.4 Vdc @ 24 Vdc	≤ 3.60 Vdc @ 24 Vdc	≤ 3.60 Vdc @ 24 Vdc	≤ 3.60 Vdc @ 24 Vdc
No-load Supply Current I_o @ U_o	≤ 10.0 mA	≤ 10.0 mA	≤ 10.0 mA	≤ 10.0 mA
Linear Span s_L ¹	4.00 mm	4.00 mm	4.00 mm	4.00 mm
Midpoint of Linear Range s_o ²	3.00 ± 0.3 mm	3.00 ± 0.3 mm	3.00 ± 0.3 mm	3.00 ± 0.3 mm
Resolution Voltage Output	Infinite ³	Infinite ³	Infinite ³	Infinite ³
Resolution Current Output	-	-	-	-
Non-linearity ⁴	≤ 0.09 mm	≤ 0.12 mm	≤ 0.12 mm	≤ 0.12 mm
Repeatability ⁵	≤ 0.09 mm	≤ 0.12 mm	≤ 0.12 mm	≤ 0.12 mm
Temperature Drift ⁶ (+15...55 °C)		0.001 mm/°C	0.001 mm/°C	0.001 mm/°C
Ambient Temperature Range T_a	+20...+50 °C	-10...+70 °C	-10...+70 °C	-10...+70 °C
Cutoff frequency (-3 dB output amplitude)	500 Hz	500 Hz	500 Hz	500 Hz
Time delay before availability t_v	≤ 1.0 ms	≤ 1.0 ms	≤ 1.0 ms	≤ 1.0 ms
Load Resistance R_L	≥ 2 k Ω	≥ 2 k Ω	≥ 2 k Ω	≥ 2 k Ω
Rated Insulation Voltage U_i	75 Vdc	250 Vac	75 Vdc	75 Vdc
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67	IP 67
Housing material	nickel plated brass	nickel plated brass	nickel plated brass	nickel plated brass
Sensing Face Material	PBTP	PBTP	PBTP	PBTP
Conductors (cable versions)			3 x 22 AWG	
Connection	connector	connector	cable	connector
Linear range display (LED ON when out of range)	yes	yes	yes	yes
Short Circuit/Overload Protected	yes	yes	yes	yes
Protected Against Polarity Reversal	yes	yes	yes	yes
Recommended connector (non-shielded)	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M		C04 AEL-00-VY-050M
Recommended Connector (shielded)	C04 ANL-00-PG-050MS	C04 ANL-00-PG-050MS		C04 ANL-00-PG-050MS

Notes

- Size of the linear sensing window
- Midpoint with tolerance, sensor to sensor
- See resolution note page 1.158
- Deviation over the linear span, 3% of full scale
- Ability to repeat output level for a given target distance, 3% of full scale
- Deviation relative to 25°C ambient temperature as a percent of full scale:
 - +15...55°C = 1%
 - +10...60°C = 2.5%
 - +10...70°C = 5%

***Temperature Output Signal**



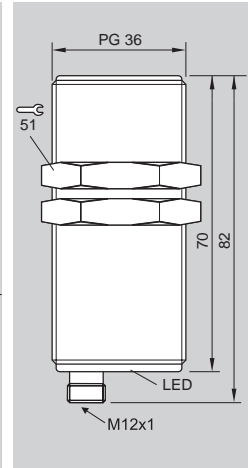
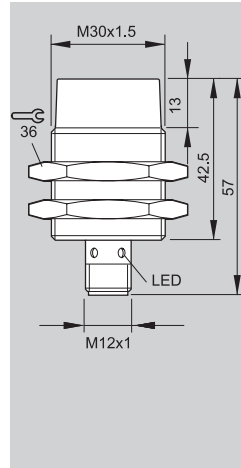
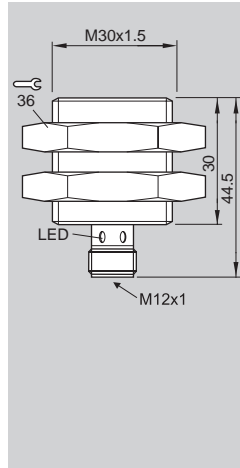
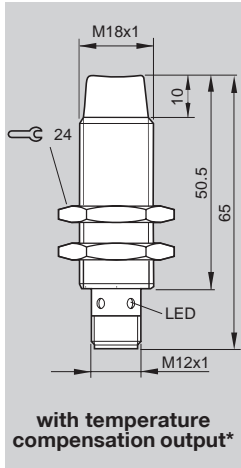
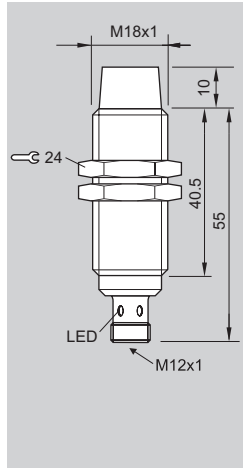
Sensors with a temperature output indicate precisely the change in measured temperature.

Analog

Inductive Sensors

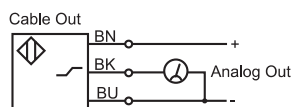
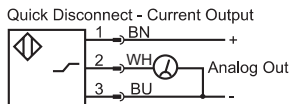
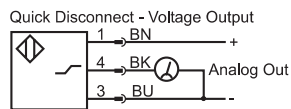
Analog Sensors
M18, M30, PG 36

M18x1	M18x1	M30x1.5	M30x1.5	PG 36
non-flush	non-flush	flush	non-flush	flush
0...10 V	0...10 V	0...10 V	0...10 V	0...10 V
2...8 mm	4...16 mm	2...10 mm	3...15 mm	0...20 mm (adj.)

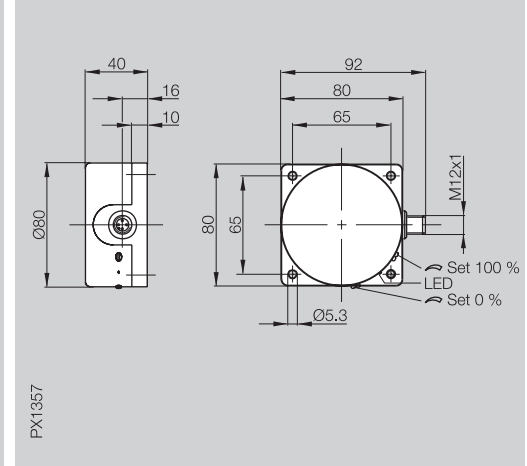
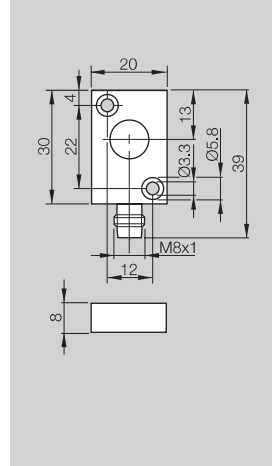
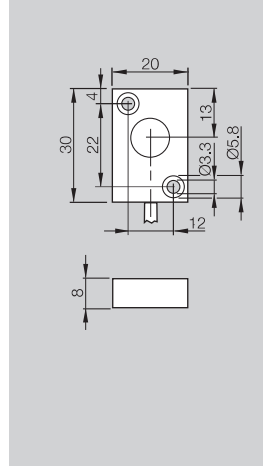


BAW M18MG-UAC80F-S04G	BAW M18MG-UAC16F-S04G-K	BAW M30ME-UAC10B-S04G	BAW M30ME-UAC15F-S04G	BAW MKZ-471.19-S4
24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc
15...30 Vdc	15...30 Vdc	15...30 Vdc	15...30 Vdc	20...30 Vdc
≤ 3.60 Vdc @ 24 Vdc	≤ 3.60 Vdc @ 24 Vdc	≤ 3.60 Vdc @ 24 Vdc	≤ 15%	≤ 3.60 Vdc @ 24 Vdc
≤ 10.0 mA	≤ 10.0 mA	≤ 10.0 mA	≤ 10.0 mA	≤ 12.0 mA
6.00 mm	12.00 mm	8.00 mm	12.00 mm	20.0 mm
5.00 ± 0.5 mm	10.00 ± 0.6 mm	6.00 ± 0.6 mm	6.00 ± 0.6 mm	10.0 ± 0.1 mm
Infinite ³	Infinite ³	Infinite ³	Infinite ³	Infinite ³
-	-	-	-	-
≤ 0.18 mm	≤ 0.36 mm	≤ 0.24 mm	≤ 0.24 mm	≤ 0.2 mm
≤ 0.18 mm	≤ 0.36 mm	≤ 0.24 mm	≤ 0.24 mm	≤ 0.2 mm
0.0015 mm/°C	0.002 mm/°C	0.002 mm/°C	0.002 mm/°C	0.005 mm/°C
-10...+70 °C	-10...+70 °C	-10...+70 °C	-10...+70 °C	-10...+70 °C
500 Hz	500 Hz	500 Hz	500 Hz	20 Hz
≤ 1.0 ms	≤ 3.0 ms	≤ 1.0 ms	≤ 1.0 ms	≤ 1.0 ms
≥ 2 kΩ	≥ 2 kΩ	≥ 2 kΩ	≥ 2 kΩ	≥ 10 kΩ
75 Vdc	250 Vac	250 Vac	250 Vac	250 V AC
IP 67	IP 67	IP 67	IP 67	IP 67
nickel plated brass	nickel plated brass	nickel plated brass	nickel plated brass	nickel plated brass
PBTP	PBTP	PBTP	PBTP	PBT
connector	connector	connector	connector	connector
yes	yes	yes	yes	no
yes	yes	yes	yes	yes
yes	yes	yes	yes	yes
C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M
C04 ANL-00-PG-050MS		C04 ANL-00-PG-050MS	C04 ANL-00-PG-050MS	C04 ANL-00-PG-050MS

Wiring Diagrams



Housing Size	20x30x8	20x30x8	80x80x40
Mounting	flush	flush	non-flush
Output Signal	0...10 V	0...10 V	0...10 V
Linear Range s _L	0.5...2 mm	0.5...2 mm	0...50 mm (adj.)



Voltage Output, 0 - 10V	BAW R06AC-UAF20B-EP03	BAW R06AC-UAF20B-S49G	BAW MKK-050.19-S4
Current Output, 0 - 20mA			
Current Output, 4 - 20mA			

Rated Operational Voltage U _e	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U _B	21.6...26.4 Vdc	20...30 Vdc	20...30 Vdc
Supply Voltage Ripple, max. 15% of U _e	≤ 10%	≤ 3.60 Vdc @ 24 Vdc	≤ 3.60 Vdc @ 24 Vdc
No-load Supply Current I ₀ @ U _e	≤ 12.0 mA	≤ 12.0 mA	≤ 12.0 mA
Linear Span s _L ¹	1.50 mm	1.50 mm	50.0 mm
Midpoint of Linear Range s _e ²	25.0 ± 1.0 mm	25.0 ± 1.0 mm	25.0 ± 1.0 mm
Resolution Voltage Output	Infinite ³	Infinite ³	Infinite ³
Resolution Current Output	-	-	-
Non-linearity ⁴	≤ 1.0 mm	≤ 1.0 mm	≤ 1.0 mm
Repeatability ⁵	≤ 1.0 mm	≤ 1.0 mm	≤ 1.0 mm
Temperature Drift ⁶ (+15...55 °C)	0.0125 mm/°C	0.0125 mm/°C	0.0125 mm/°C
Ambient Temperature Range T _a	-10...+70 °C	-10...+70 °C	-10...+70 °C
Cutoff Frequency (-3 dB output amplitude)	15 Hz	15 Hz	15 Hz
Time delay before availability t _v	≤ 1.0 ms	≤ 1.0 ms	≤ 1.0 ms
Load Resistance R _L	≥ 10 kΩ	≥ 10 kΩ	≥ 10 kΩ
Rated Insulation Voltage U _i	250 Vac	250 Vac	250 Vac
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67
Housing Material	aluminum	aluminum	PBT
Sensing Face Material	PBT	PBT	PBT
Conductors (cable versions)	3 x 26 AWG		
Connection	cable	connector	connector
Linear range display (LED ON when out of range)	no	no	no
Short Circuit/Overload Protected	yes	yes	yes
Protected Against Polarity Reversal	yes	yes	yes
Recommended Connector (non-shielded)		C49 ANE-00-VY-050M	C04 AEL-00-VY-050M
Recommended Connector (shielded)		BKS S75-14-03	C04 ANL-00-PG-050MS

Notes

1. Size of the linear sensing window
2. Midpoint with tolerance, sensor to sensor
3. See resolution note page 1.158
4. Deviation over the linear span, 3% of full scale
5. Ability to repeat output level for a given target distance, 3% of full scale
6. Deviation relative to 25°C ambient temperature as a percent of full scale:
 - +15...55°C = 1%
 - +10...60°C = 2.5%
 - +10...70°C = 5%

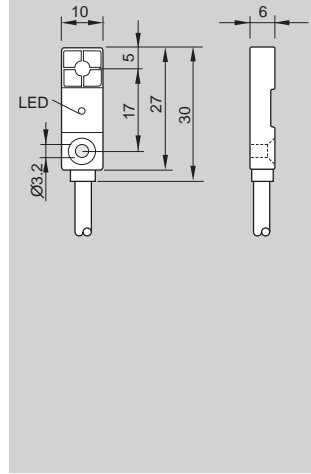
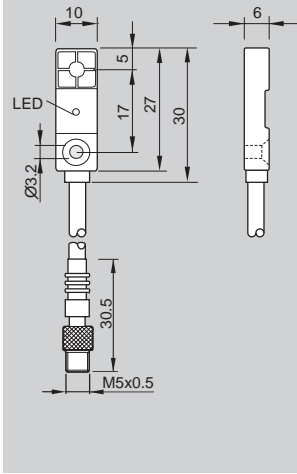
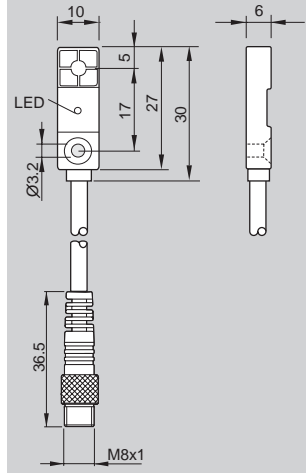


Analog

Inductive Sensors

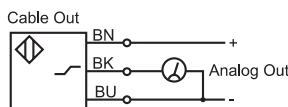
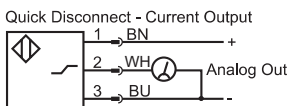
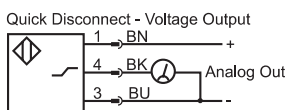
Analog Sensors
10x30x6

Housing Size	10x30x6	10x30x6	10x30x6
Mounting	flush	flush	flush
Output Signal	0...10 V	0...10 V	0...10 V
Linear Range s_L	1...4 mm	1...4 mm	1...4 mm



Voltage Output, 0 - 10V	BAW R03KC-UAE40B-BP00,3-GS49	BAW R03KC-UAE40B-BP00,3-GS26	BAW R03KC-UAE40B-BP03
Current Output, 0 - 20mA			
Current Output, 4 - 20mA			
Rated Operational Voltage U_e	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U_B	21.6...26.4 Vdc	21.6...26.4 Vdc	21.6...26.4 Vdc
Supply Voltage Ripple, max. 15% of U_e	≤ 3.60 Vdc @ 24 Vdc	≤ 3.60 Vdc @ 24 Vdc	≤ 3.60 Vdc @ 24 Vdc
No-load Supply Current I_0 @ U_e	≤ 15.0 mA	≤ 15.0 mA	≤ 15.0 mA
Linear Span s_L ¹	3.0 mm	3.0 mm	3.0 mm
Midpoint of Linear Range s_s ²	2.5 ± 0.3 mm	2.5 ± 0.3 mm	2.5 ± 0.3 mm
Resolution Voltage Output	Infinite ³	Infinite ³	Infinite ³
Resolution Current Output	-	-	-
Non-linearity ⁴	$\leq \pm 150$ mm	$\leq \pm 150$ mm	$\leq \pm 150$ mm
Repeatability ⁵	≤ 35 μ m	≤ 35 μ m	≤ 35 μ m
Temperature Drift ⁶ (+15...55 °C)	-	-	-
Ambient Temperature Range T_a	0...+70 °C	0...+70 °C	0...+70 °C
Cutoff Frequency (-3 dB output amplitude)	1000 Hz	1000 Hz	1000 Hz
Time delay before availability t_v	≤ 1.0 ms	≤ 1.0 ms	≤ 1.0 ms
Load Resistance R_L	≥ 5 k Ω	≥ 5 k Ω	≥ 5 k Ω
Rated Insulation Voltage U_i	75 Vdc	75 Vdc	75 Vdc
Degree of Protection per IEC 529	IP 67	IP 67	IP 67
Housing Material	PA6	PA6	PA6
Sensing Face Material	PA6	PA6	PA6
Conductors (cable versions)			3 x 26 AWG
Connection	cable w/connector	cable w/connector	cable
Short Circuit/Overload Protected	no	no	no
Protected Against Polarity Reversal	no	no	no
Recommended Connector (non-shielded)	C49 ANE-00-VY-050M	BKS-B 25-1-PU-03	
Recommended Connector (shielded)	BKS S75-14-03		

Wiring Diagrams



Inductive

1

- Contents
- Selection Charts
- Part Numbers
- Featured
 - GlobalProx®
 - DC 3-Wire
 - DC 2-Wire
 - SteelFace®
 - 2x
 - 3x
 - Fe/NFe
 - Welding
 - Factor 1
 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories

- 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
 - DC 2-Wire Block
- Specialty
 - SuperShorties™
 - Proxinox®
 - High Temp
 - Analog
 - Large Housing
 - Ring Sensor

6 Connectors

7 Accessories

o Product Overview

t Technical Reference

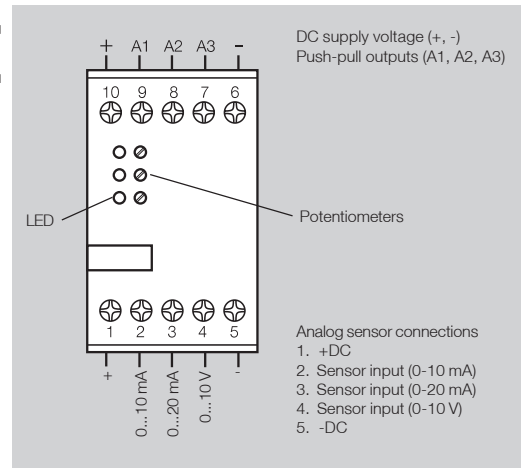
p Part Number Index

Analog Set Point Controller

The basic unit is powered with 24 Vdc (terminals 6 & 10). It provides the supply voltage for Balluff analog sensors (terminals 1-5) and is switched directly by their analog outputs. Based on these signals, three switch-points (A1...A3) are output through separate push-pull final stages (PNP/NPN). The switchpoints are individually set using the front-mounted potentiometers. The corresponding switching state is displayed using LED's. The effective direction (rising/falling) can be configured using wire jumpers inside the controller.

The signal inputs are protected against polarity reversal and the push-pull stages against short circuit (fuse protected internally).

Analog Set Point Controller
for analog current and voltage signals



Ordering Code	BES 516-611-A-1
Supply Voltage U_B	24 Vdc
Ripple	≤ 10%
Input circuit	
Current Input (terminal 2/terminal 3)	0...10 mA/0...20 mA
Input Resistance	308 Ω/154 Ω
Voltage Input (terminal 4)	0...10 V
Input Resistance	13 kΩ
Range of Adjustment	3...100 %
Hysteresis (with respect to the pre-set value)	3 %
Output circuit	
Voltage Drop PNP Transistor	≤ 3.5 V
Voltage Drop NPN Transistor	≤ 2.5 V
Operational Current per Push-pull Stage	≤ 200 mA
Housing Material	PC (fiberglass reinforced)
Housing Dimensions b × l × h	74 × 45 × 120 mm
Connection	screw terminals
Max. Cross Section for Connection	up to 2.5 mm ²
Mounting	snap-on rail mount
Ambient Temperature Range T_a	0...+50 °C
Degree of Protection per IEC 60529	terminals IP 20, housing IP 40



Analog

Analog Sensor with 3 Digital Outputs

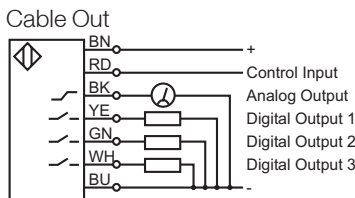
For the ultimate in flexibility, Balluff offers an analog sensor with three independently programmable, discrete setpoint outputs, along with an analog voltage output for reference. By holding a metal target in position and momentarily connecting the control line to the supply, the output is preset to change states whenever it reaches the programmed analog signal level. Setpoint programming can be accomplished using a PLC output, a pushbutton, or with an available hand-held teach unit. (Order separately BES-516-4, see section 7). A total of 3 digital outputs can be programmed.

Features

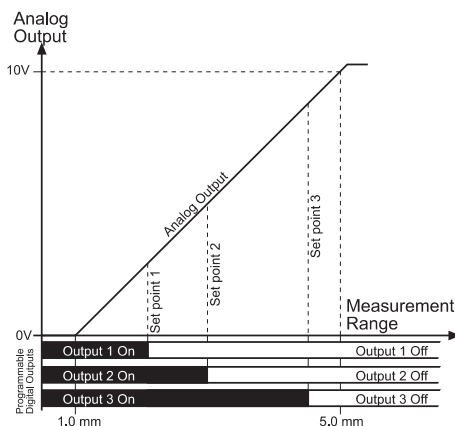
All the exceptional features from our standard analog family plus...

- Remotely programmable setpoints
- No need to physically adjust sensor position for a particular setpoint
- Status LED for each setpoint output, depending on model

Wiring Diagram



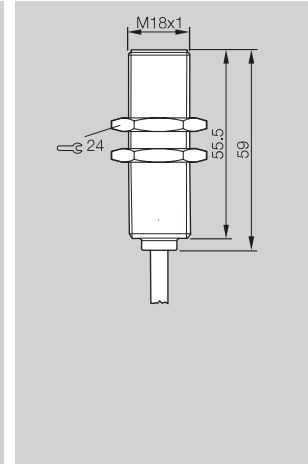
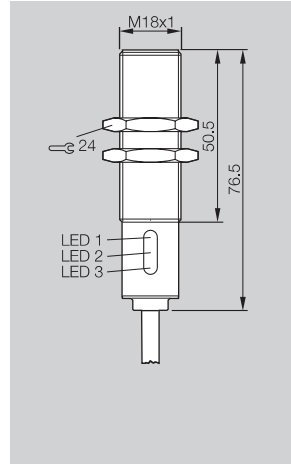
Characteristic Output



Inductive Sensors

M18
with 3 Programmable
Switching Outputs

Housing Size	M18x1	M18x1
Mounting	flush	flush
Output Signal	0...10 V	0...10 V
Linear Range s_1	1...5 mm	1...5 mm



Ordering Code	BAW M18MI2-UAC50B-BP05-002	BAW M18MM-UAZ50B-BP05-505
Rated Operational Voltage U_o	24 Vdc	24 Vdc
Supply Voltage U_B	15...30 Vdc	21.6...26.4 Vdc
Ripple	$\leq 15\% U_o$	$\leq 10\% U_o$
Rated Insulation Voltage U_i	250 Vac	250 Vac
Rated Sensing Distance S_o	3 mm	3 mm
Load Resistance R_L for Analog Output	$\leq 2 \text{ k}\Omega$	$\leq 2 \text{ k}\Omega$
No-load Supply Current I_o at U_o	20 mA	20 mA
Protected Against Polarity Reversal	yes	yes
Short Circuit Protected	yes	yes
Ambient Temperature Range T_a	-10...+70 °C	-10...+60 °C
Degree of Protection per IEC 60529	IP 67	IP 67
Housing Material	nickel plated brass	nickel plated brass
Material of Sensing Face	PBT	PBT
Connection	cable	cable
No. of Wires x Gauge	7 x 24 AWG	7 x 24 AWG
Approval	cULus	cULus
LED Indication for each Output	yes	no
Teach-in Function	yes	yes
Hysteresis	$\leq 0.3 \text{ mm}$	$\leq 0.3 \text{ mm}$
Repeat Accuracy R	$\leq 0.1 \text{ mm}$	$\leq 0.1 \text{ mm}$
Rated Operational Current I_o	20 mA	20 mA
For one Switching Output		
Voltage Drop U_d at I_o	$\leq 1.5 \text{ V}$	$\leq 1.5 \text{ V}$

Inductive

1

- Contents
- Selection Charts
- Part Numbers
- Featured
 - GlobalProx®
 - DC 3-Wire
 - DC 2-Wire
 - SteelFace®
 - 2x
 - 3x
 - Fe/NFe
 - Welding
 - Factor 1
 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories

- 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
 - DC 2-Wire Block

- Specialty
 - SuperShorties™
 - Proxinox®
 - High Temp
 - Analog
 - Large Housing
 - Ring Sensor

6 Connectors

7 Accessories

o Product Overview

t Technical Reference

p Part Number Index



In-Line Analog Set Point Controller with Integrated Switching Outputs

This device can be connected to any Balluff 0...10V analog sensor (Inductive, Photoelectric, BIL) and provide an analog output plus 3 integrated switching outputs.

Analog sensors provide a signal which is proportional to the target distance from the sensor face. However, many applications also require a switching signal at certain points along the full range.

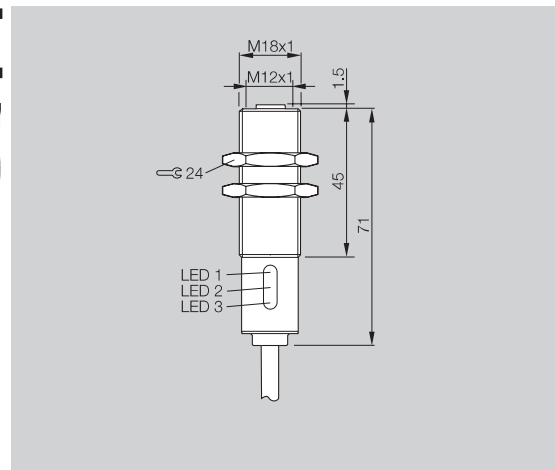
The 3 switching outputs are programmed using a teach-in procedure by holding a target in position and momentarily connecting the control line to the supply, the digital output is programmed for that point. A total of 3 outputs are programmable.

In addition to the 3 digital outputs, a 0-10 V analog signal is also provided.

An LED for each output indicates the switching state of that output.

Housing Size	M18x1
Output Signal	0...10 V

Housing Size	M18x1
Output Signal	0...10 V



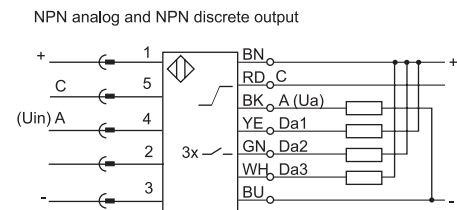
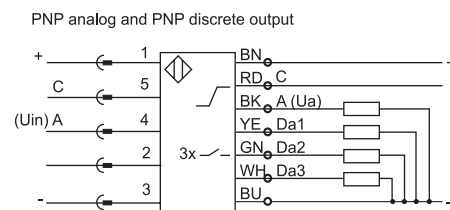
PNP	Normally-open
NPN	Normally-open

BES 516-615-PS-1-PU-05
BES 516-615-NS-1-PU-05

Rated Operational Voltage U_e	24 Vdc
Supply Voltage U_B	15...30 Vdc
Ripple	≤ 15%
Rated Insulation Voltage U_i	75 Vdc
Load Resistance R_L for Analog Output	4200 Ohm
No-load Supply Current I_0 at U_e	20 mA
Protected Against Polarity Reversal	yes
Ambient Temperature Range T_a	-10...+70 °C
Hysteresis	500mV
Operating Frequency f	2000
Degree of Protection per IEC 60529	IP 67
Housing Material	nickel plated brass
Connection	cable
No. of Wires x Gauge	7 x 24 AWG
Approvals	cULus
LED Indication for each Output	yes
Teach-in Function	yes
Rated Operational Current I_e for one Switching Output	100 mA
Voltage Drop U_d at I_e	≤ 1.5 V

Rated Operational Voltage U_e	24 Vdc
Supply Voltage U_B	15...30 Vdc
Ripple	≤ 15%
Rated Insulation Voltage U_i	75 Vdc
Load Resistance R_L for Analog Output	4200 Ohm
No-load Supply Current I_0 at U_e	20 mA
Protected Against Polarity Reversal	yes
Ambient Temperature Range T_a	-10...+70 °C
Hysteresis	500mV
Operating Frequency f	2000
Degree of Protection per IEC 60529	IP 67
Housing Material	nickel plated brass
Connection	cable
No. of Wires x Gauge	7 x 24 AWG
Approvals	cULus
LED Indication for each Output	yes
Teach-in Function	yes
Rated Operational Current I_e for one Switching Output	100 mA
Voltage Drop U_d at I_e	≤ 1.5 V

Wiring Diagrams



Large Housing

Extended switching distance

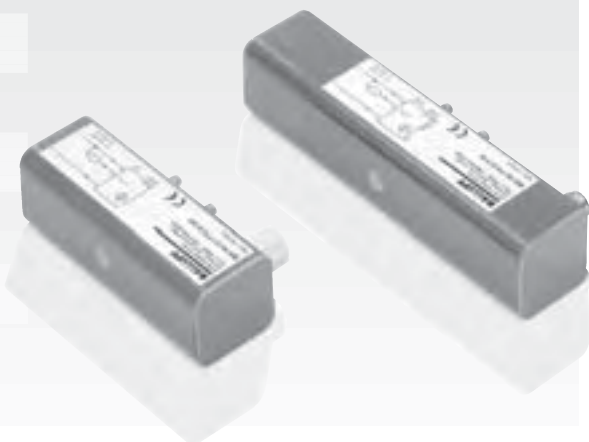
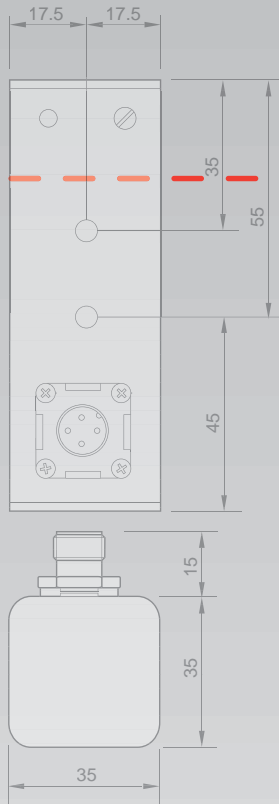
Inductive Sensors

Large Housing Contents

Large Housing Sensors

Certain inductive sensor applications call for exceptionally long sensing ranges. With their large-diameter sensing coils, Balluff's large housing inductive sensors meet these requirements. Available in round housing diameters from 80 mm to 163 mm and in rectangular housing dimensions of 100x35x35 mm or 200x35x35 mm, with sensing distances up to 100 mm in some models. A choice of AC or DC versions suit a wide range of control interface needs.

- 1.172** AC Long Range Pancake Style
- 1.173** DC Long Range Pancake Style
- 1.174** Bar Style

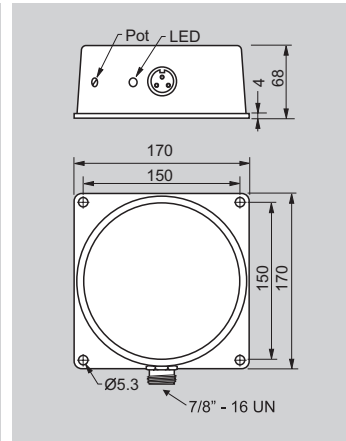
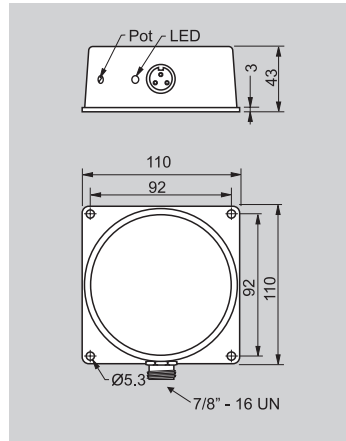


Inductive

1

- Contents
- Selection Charts
- Part Numbers
- Featured
 - GlobalProx®
 - DC 3-Wire
 - DC 2-Wire
 - SteelFace®
 - 2x
 - 3x
 - Fe/NFe
 - Welding
 - Factor 1
 - Weld Field Immune
 - SlagMaster®
 - Welding Accessories
- 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
 - DC 2-Wire Block
- Specialty
 - SuperShorties™
 - Proxinox®
 - High Temp Analog
 - Large Housing Ring Sensor**
- 6 Connectors
- 7 Accessories
- o Product Overview
- t Technical Reference
- p Part Number Index

Housing Size	Ø 100 mm	Ø 163 mm
Mounting	non-flush	non-flush
Rated Operating Distance S_n	35-105 mm	50-120 mm



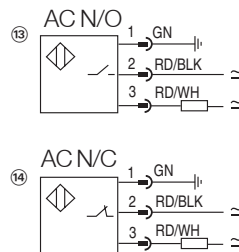
AC	Normally-open ¹³	BES IKN-S5-070-W-4-S	BES IKO-S5-100-W-4-S
AC	Normally-closed ¹⁴	BES IKN-S5-070-W-4-O	BES IKO-S5-100-W-4-O
Nominal Sensing Distance S_n	70mm	100mm	
Adjustable Range	35...105mm	50...120 mm	
Supply Voltage	15-350 Vdc, 20-260 Vac	85-140 Vac	
Supply Frequency	45-65 Hz	45-65 Hz	
Target	Steel, 1 mm thick	Steel, 1 mm thick	
Switching Hysteresis	≤ 15% of S_n	≤ 15% of S_n	
Repeatability	≤ 5% of S_n	≤ 5% of S_n	
Ambient Temperature Range	-25° C...+70° C	-25° C...+70° C	
Temperature Drift	≤ 5% of S_n	≤ 10% of S_n	
Function Display	LED	LED	
Current Consumption Minimum	5 mA	5 mA	
Current Consumption Maximum	300 mA	500 mA	
Short-time Load Current Maximum	1 A/100 msec	1 A/100 msec	
Short Circuit Protection	yes	yes	
Leakage Current	≤ 1.5 ma @ 110 Vac	≤ 1.5 ma @ 110 Vac	
Voltage Drop V_d	≤ 10 V at 5 mA load	≤ 10 V at 5 mA load	
Overload Protection	yes	yes	
Housing Material	Makrolon Polyester	Makrolon Polyester	
Mounting Type	Surface mounting - 4 mounting holes	Surface mounting - 4 mounting holes	
Protection Class per DIN 40050	IP 67, NEMA 4, 4X, 6, 12, 13	IP 67, NEMA 4, 4X, 6, 12, 13	
Recommended Connector	C05 AE1-00-VY-150F	C05 AE1-00-VY-150F	

These sensors are specifically designed for use in heavy industrial environments such as:

- Automotive Manufacturing
- Steel Mills
- Assembly and Fabrication Lines
- Pipe and Rod Mills
- Conveyors

Additional models may be available. Refer to company website for details

Wiring Diagrams



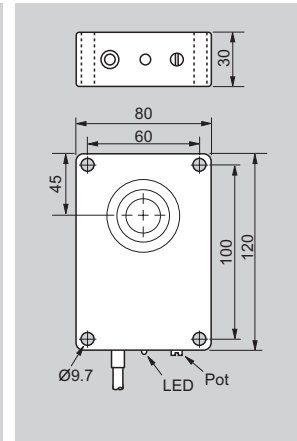
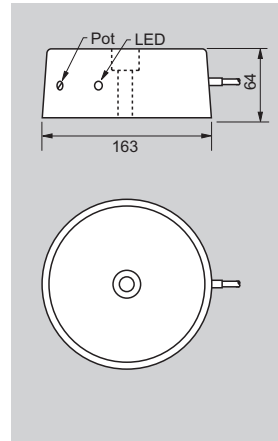
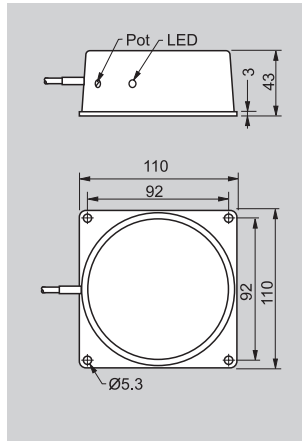
Large Housing

Extended switching distance

Inductive Sensors

DC Long Range
Pancake Style

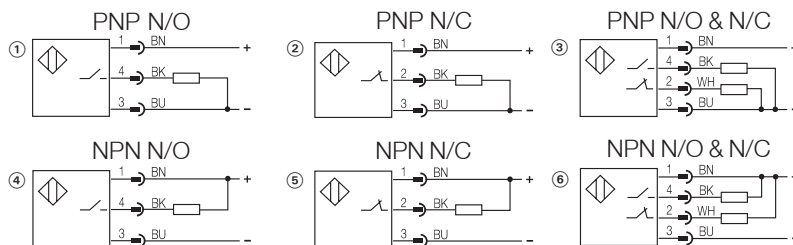
Housing Size	Ø 100 mm	Ø 163 mm	120 x 80 x 30
Mounting	non-flush	non-flush	non-flush
Rated Operating Distance s_n	70 mm	100 mm	50 mm



PNP	Normally-open ①	BES IKN-K-070-P-1-S	BES IKO-K-100-P-1-S	BES IKRD-K-050-P-1-S
	Normally-closed ②			BES IKRD-K-050-P-1-O
NPN	Normally-open ④		BES IKO-K-100-N-1-S	BES IKRD-K-050-N-1-S
Rated Operational Voltage U_e		24 Vdc	24 Vdc	24 Vdc
Supply Voltage U_B		10...30 Vdc	10...30 Vdc	10...30 Vdc
Voltage Drop U_d at I_e		≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
Rated Insulation Voltage U_i		75 Vdc	75 Vdc	75 Vdc
Load Current Capacity		≤ 400 mA	≤ 500 mA	≤ 200 mA
Current Consumption (closed/open)		≤ 25 mA / ≤ 12 mA	≤ 25 mA / ≤ 12 mA	≤ 25 mA / ≤ 12 mA
Protected Against Polarity Reversal		yes	yes	yes
Short Circuit Protected		yes	yes	yes
Load Capacitance		≤ 1 µF	≤ 1 µF	≤ 1 µF
Repeat Accuracy R		≤ 5%	≤ 5%	≤ 5%
Ambient Temperature Range T_a		-25...+70°C	-25...+70°C	-25...+70°C
Operating Frequency f		80 Hz	100 Hz	100 Hz
Function Indication		yes	yes	yes
Degree of Protection per IEC 60529		IP 67*	IP 67*	IP 67*
Housing Material		plastic PBT	plastic	plastic
Material of Sensing Face		plastic PBT	plastic	plastic
Connection		cable	cable	cable
No. of Wires x Gauge		3 x 22 AWG	3 x 22 AWG	3 x 22 AWG

* Meets IP67 when potentiometer cover screw is properly installed.

Wiring Diagrams



Inductive

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Contents
Selection Charts
Part Numbers

Featured

- GlobalProx®
- DC 3-Wire
- DC 2-Wire
- SteelFace®
- 2x
- 3x
- Fe/NFe
- Welding
- Factor 1
- Weld Field Immune
- SlagMaster®
- Welding Accessories

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
- DC 2-Wire Block

Specialty

- SuperShorties™
- Proxinox®
- High Temp
- Analog
- Large Housing Ring Sensor

6 Connectors

7 Accessories

o Product Overview

t Technical Reference

p Part Number Index

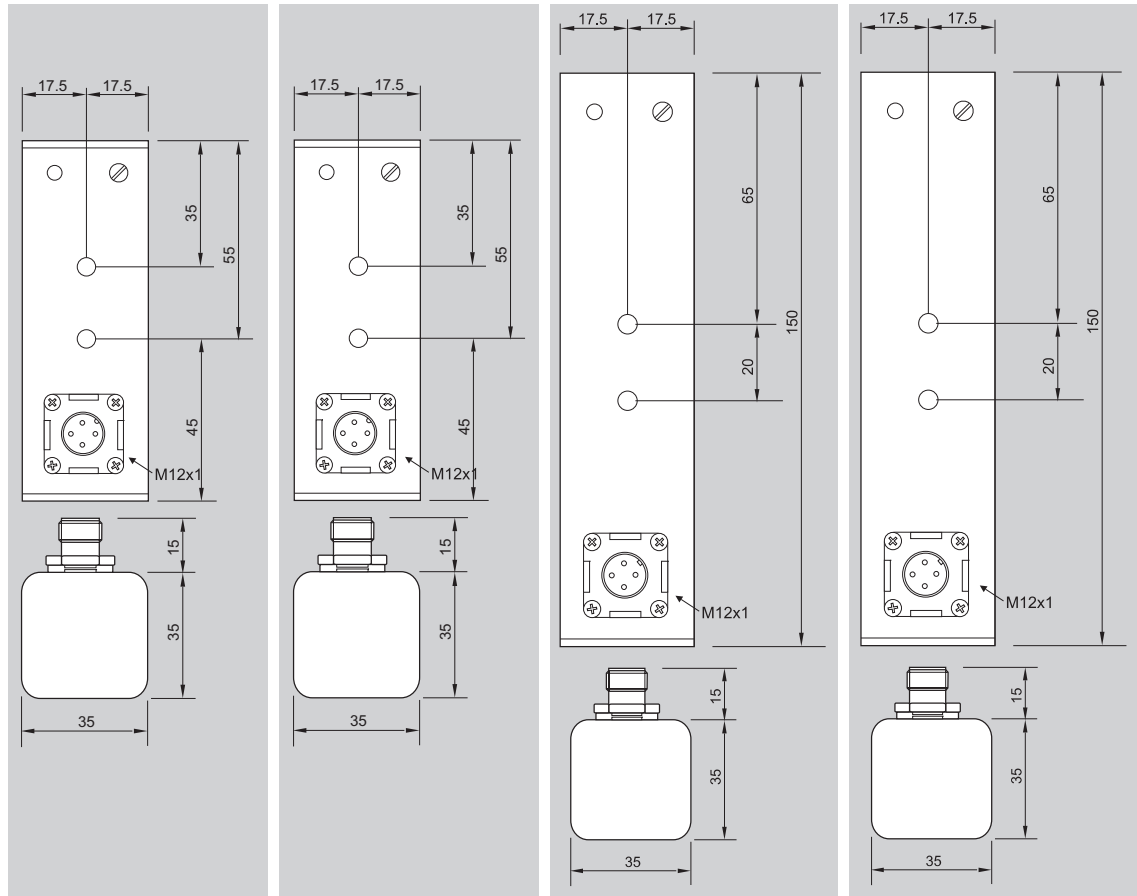
Inductive Sensors

3-Wire DC, 2-Wire AC
Long Range
Bar Style

Large Housing

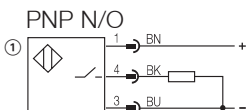
Extended switching distance

Housing Size	100 x 35 x 35	100 x 35 x 35	150 x 35 x 35	150 x 35 x 35
Mounting	non-flush	non-flush	non-flush	non-flush
Rated Operating Distance S_n	5...45 mm Adjustable	30 mm Factory Set	5...45 mm Adjustable	12 mm Factory Set



PNP	Normally-open ①	BES IKU-011-P-1-S-S4-SA1	BES IKU-011.23-G-S4-SA2	BES IKU-015-23-G-S4	BES IKU-015.23-G-S4-SA1
Rated Operational Voltage		24 Vdc	24 Vdc	24 Vdc	24 Vdc
Supply Voltage		10...30Vdc	10...30Vdc	10...30Vdc	10...30 Vdc
Voltage Drop at Output		≤ 2.0 V	≤ 2.0 V	≤ 2.0 V	≤ 2.0 V
Load Current Capacity		≤ 400 mA	≤ 400 mA	≤ 400 mA	≤ 400 mA
Reverse Polarity Protection		yes	yes	yes	yes
Short Circuit Protection		yes	yes	yes	yes
Ambient Temperature Range		-25...+70°C	-25...+70°C	-25...+70°C	-25...+70°C
Operating Frequency (max.)		50 Hz	50 Hz	50 Hz	50 Hz
Function Indication		yes	yes	yes	yes
Degree of Protection per IEC 60529		IP 65	IP 65	IP 65	IP 65
Housing Material		plastic	plastic	plastic	plastic
Sensing Face Material		plastic	plastic	plastic	plastic
Connection		connector	connector	connector	connector
Recommended Connector		C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M	C04 AEL-00-VY-050M

Wiring Diagrams



Ring Sensors

Inductive Sensors

Ring Sensors Contents

Ring Sensors

Balluff's ring sensors can detect small metal objects passing through their active window. They can be used in a variety of automated assembly applications including feed monitors for screws, nails, nuts, bolts, or many other small metal parts. The output of the unit is static, which means that it remains active as long as the metal part is present in the sensing zone.

1.176 DC 3-/4- Wire 80 x 45 mm

1.177 DC 3-/4- Wire 120 x 80 mm, 115 x 80 mm



Inductive

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Contents

Selection Charts

Part Numbers

Featured

GlobalProx®
– DC 3-Wire
– DC 2-Wire

SteelFace®
– 2x
– 3x
– Fe/NFe

Welding
– Factor 1
– Weld Field Immune
– SlagMaster®
– Welding Accessories

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

DC 2-Wire Block

Specialty

SuperShorties™
Proxinox®
High Temp
Analog
Large Housing
Ring Sensor

6 Connectors

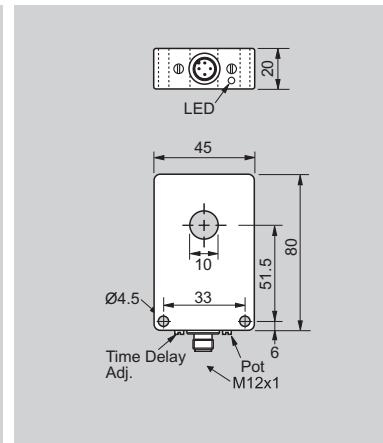
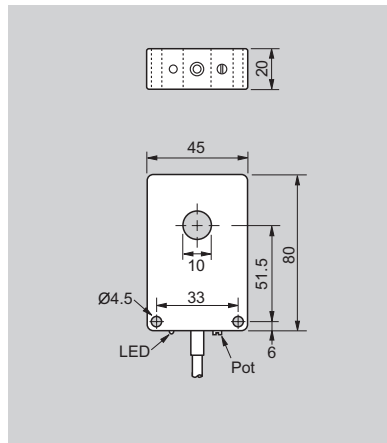
7 Accessories

O Product Overview

t Technical Reference

p Part Number Index

Housing Size	80 x 45 mm	80 x 45 mm
Mounting	flush**	flush
Rated Operating Distance s_n	\varnothing 10 mm	\varnothing 10 mm

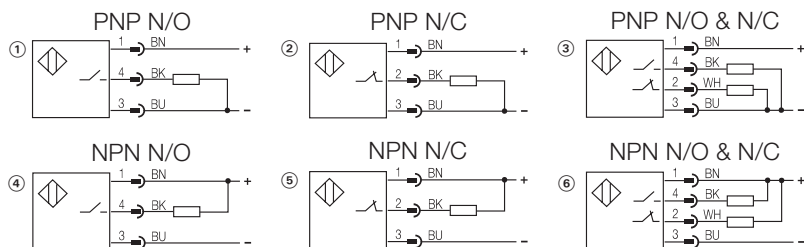


PNP	Normally-open ① Normally-closed ②	BES IKV-K-010-PS-1-Y BES IKV-K-010-PO-1-Y	BES IKV-S4-010-PS-1-Y
NPN	Normally-open ④ Normally-closed ⑤		BES IKV-S4-010-NS-1-Y-TD
Rated Operational Voltage U_e		24 Vdc	24 Vdc
Supply Voltage U_B		10...30 Vdc	10...30 Vdc
Voltage Drop U_d at I_e		≤ 3.5 Vdc	≤ 2.0 Vdc
Load Current Capacity		≤ 200 mA	≤ 200 mA
Current Consumption (closed/open)		≤ 12 mA	≤ 12 mA
Protected against Polarity Reversal		yes	yes
Short Circuit Protected		yes	yes
Repeat Accuracy R		$\leq 5\%$	$\leq 5\%$
Ambient Temperature Range T_a		-25... +70°C	-25... +70°C
Operating Frequency f		≤ 1000 Hz	4-400 Hz
Function Indication		yes	yes
Degree of Protection per IEC 60529		IP 65	IP 65
Housing Material		plastic	plastic
Material of Sensing Face		plastic	plastic
Connection		cable	connector
No. of Wires x Gauge		3 x 20 AWG	
Recommended Connector			C04 AEL-00-VY-050M

Standard cable length = 2 m PVC
Other cable lengths and jacket materials may be available. Additional models may also exist. Refer to company website for details.

** Flush mounting is possible when adjusted for minimum sensing distance.

Wiring Diagrams



Ring Sensors

Inductive Sensors

DC 3-/4- Wire Ring Sensors

80 x 45 mm non-flush Ø 25 mm	80 x 45 mm non-flush Ø 25 mm	120 x 80 mm non-flush Ø 45 mm	115 x 80 mm non-flush Ø 45 mm
BES IKV-K-025-PS-1-Y BES IKV-K-025-PO-1-Y	BES IKV-025.23-G-Z-S4	BES IKV-K-045-PS-1-Y BES IKV-K-045-PO-1-Y	BES IKV-045.23-G-Z-S4
BES IKV-K-025-NS-1-Y	BES IKV-S4-025-NS-1-Y-TD	BES IKV-K-045-NS-1-Y	
24 Vdc	24 Vdc	24 Vdc	24 Vdc
10...30 Vdc	10...30 Vdc	10...30 Vdc	18...30 Vdc
≤ 3.5 Vdc	≤ 2.0 Vdc	≤ 3.5 Vdc	≤ 20 Vdc
≤ 200 mA	≤ 200 mA	≤ 400 mA	≤ 200 mA
≤ 12 mA	≤ 12 mA	≤ 12 mA	≤ 12 mA
yes	yes	yes	yes
yes	yes	yes	yes
≤ 5%	≤ 5%	≤ 5%	≤ 5%
-25... +70°C	-25... +70°C	-25... +70°C	-25... +70°C
≤ 1000 Hz	4-400 Hz	≤ 100 Hz	
yes	yes	yes	yes
IP 65	IP 65	IP 65	IP 65
plastic	plastic	plastic	plastic
plastic	plastic	plastic	plastic
cable	connector	cable	connector
3 x 20 AWG		3 x 20 AWG	
	C04 AEL-00-VY-050M		C04 AEL-00-VY-050M



– For mating connectors see section 6.

