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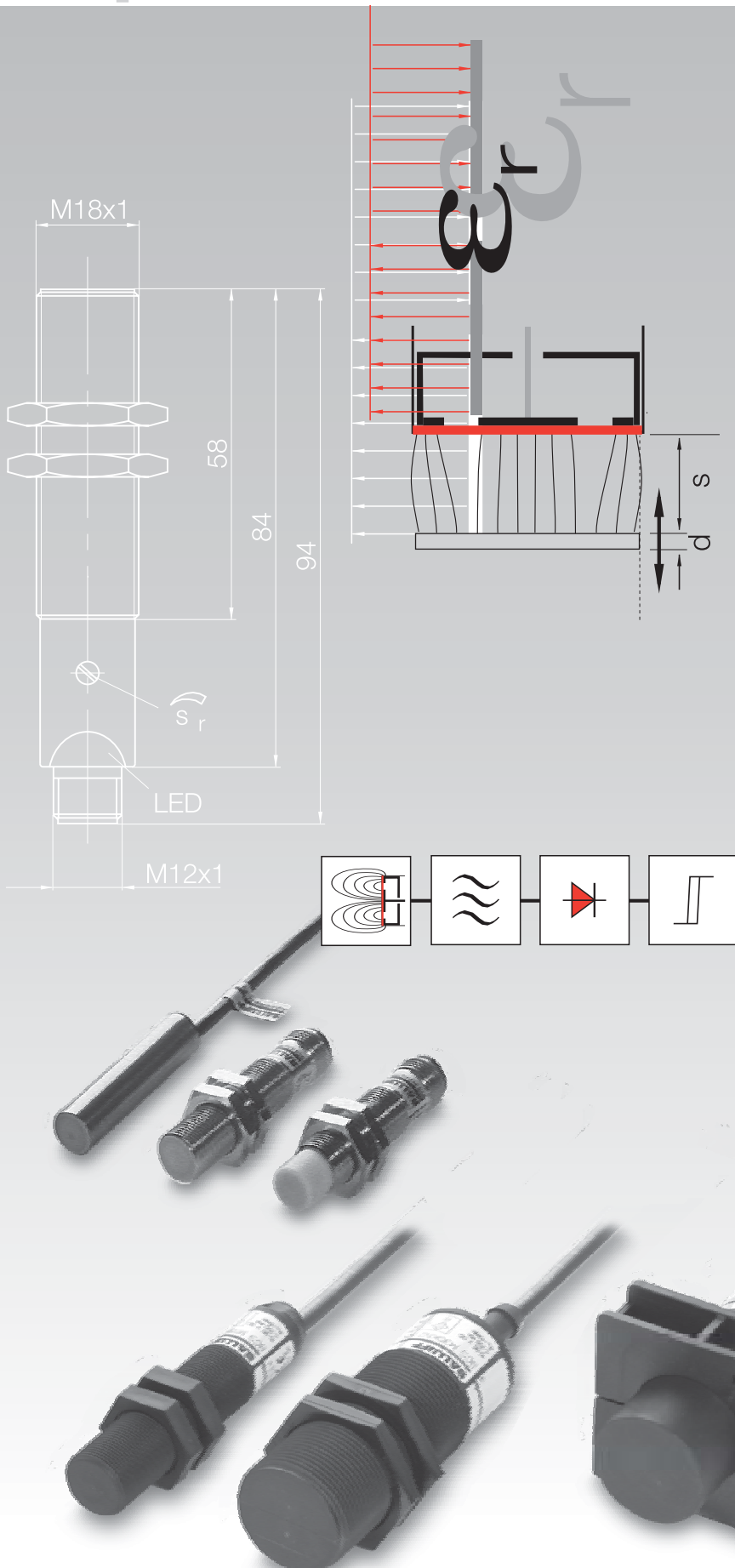
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### Capacitive Sensors

For non-contact detection of non-metallic and metallic materials at ranges generally under 50mm (2 inches), capacitive sensors detect a change in capacitance caused by the approach of objects into their electrostatic field. Capacitive sensors find broad use in detecting plastic granules, liquids, bulk food products, or very small metal parts, and are used extensively in applications involving plastic injection molding, packaging, and liquid level detection. Advantages of capacitive sensors include the ability to "tune out" non-metallic walls and barriers in order to detect liquids or bulk materials on the other side, and detection of very small metal parts that would be ignored by inductive proximity sensors.

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Housing Size	8 mm	10 mm	12 mm	18 mm	18 mm	
<b>Sensing Range</b>						
Flush	1.5 mm	4 mm	4 mm	8 mm	8 mm	
Non-flush	3 mm		8 mm	15 mm		
Self-adapting						
<b>Connection</b>						
Integral Connector	M8		M12	M12		
Pigtail Connector						
Prewired Cable		■	■	■	■	
<b>Outputs</b>						
PNP N.O. 3-Wire	11...30 V	12...35 V	12...35 V	10...36 V		
PNP N.C. 3-Wire	11...30 V	12...35 V	12...35 V	10...36 V		
NPN N.O. 3-Wire	11...30 V	12...35 V	12...35 V	10...36 V		
NPN N.C. 3-Wire	11...30 V	12...35 V	12...35 V	10...36 V		
PNP/NPN N.O./N.C. Selectable						
AC/DC 2-Wire					20...250 V	
<b>Housing Material</b>						
Plastic			PVC	PBT and PTFE	PBT	
Metal	SS	SS	CuZn			
<b>Sensing Face Material</b>	PTFE	PTFE	PTFE and PVC	PBT and PTFE	PBT	
<b>Attributes</b>						
Short Circuit Protection	■	■	■	■		
Reverse Polarity Protection	■	■	■	■		
Temperature Range Up to 60°C						
Temperature Range Up to 70°C	■	■	■	■		
Temperature Range Up to 80°C				■	■	
Protection	IP 65	IP 65	IP 65	IP 67	IP 67	
CE	■	■	■	■	■	
cULus				■	■	
<b>Pages</b>	<b>4.5</b>	<b>4.6</b>	<b>4.6</b>	<b>4.7</b>	<b>4.11</b>	

## PTFE Housing 18 & 30 mm Sensors

See pages 4.7 and 4.9.



Balluff capacitive sensors with PTFE housing are ideal for semiconductor and chemical processing applications. PTFE resists attack from aggressive solvents such as de-ionized water and concentrated sulfuric acid fumes.

# Selection Guide

## Capacitive Proximity Sensors

Selection Guide



	30 mm	30 mm	34 mm	34 mm	50 mm Flat Pack	34x16x8 mm Mini
	15 mm 30 mm	15 mm	20 mm	20 mm	25 mm	8 mm
						■
	M12				M8	■
	■	■	■	■	■	
	10...36 V		10...36 V			12...30 V
	10...36 V		10...36 V			12...30 V
	10...36 V		10...36 V			12...30 V
	10...36 V		10...36 V			12...30 V
					10...30 V	
		20...250 V		20...250 V		
	PBT and PTFE	PBT	PBT	PBT	POM	PP
	PBT and PTFE	PBT	PBT	PBT	POM	PP
	■		■		■	■
	■		■		■	■
	■	■	■	■		■
	IP65 & IP 67	IP 67	IP 65	IP 67	IP 67	IP 67
	■	■	■	■	■	■
	■	■	■	■		
	<b>4.8</b>	<b>4.11</b>	<b>4.9</b>	<b>4.11</b>	<b>4.10</b>	<b>4.10</b>

## Accessories

See page 4.12 for more details.



Protective PTFE switchwells are perfect for attaching capacitive sensors to containers for level detection.



Sight glass bracket for mounting sensors to tubing.

**Note:** Refer to the accessories section for a complete selection of standard clamps and mounting brackets.

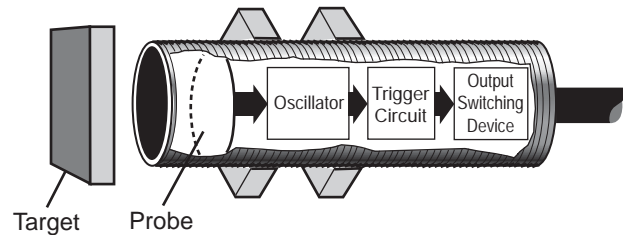
## Capacitive Sensors Improve Quality and Increase Flexibility

Today's world of complex processes requires solutions that are designed to give you maximum uptime and provide a wide range of uses. Capacitive sensors from Balluff are manufactured to furnish you the flexibility you need in the places you need it. With a variety of body styles, adjustable sensing ranges, and special features, Balluff's BCS family can solve applications that are not well suited to traditional inductive or photoelectric sensing technologies.

Capacitive sensors are able to...

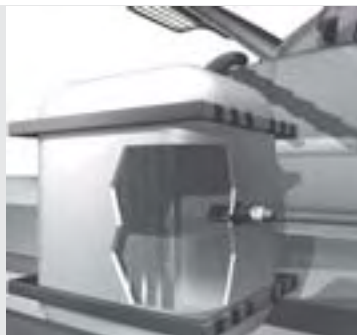
- Detect a target independent of color
- Detect metallic and non-metallic targets
- "Tune out" non-metallic container walls and mounting hardware to "see what's inside"
- Detect very small metal parts or thin-gauge wires

### How They Work



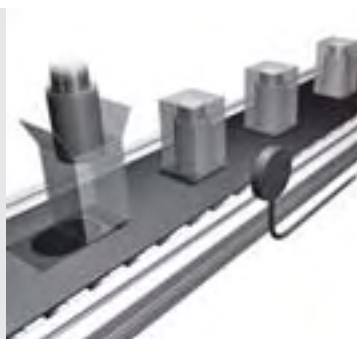
Capacitive sensors consist of a probe, an oscillator, a trigger circuit, and an output switching device. The sensor generates an electrostatic field and detects changes in this field as a target approaches the sensing face.

Refer to the Technical Reference section for additional information.



### Fluid Level Control with BCS Capacitive Sensors

Various fluids must be added to vehicles as part of the overall assembly process. Balluff BCS capacitive sensors are able to detect the level of virtually any material, making them the perfect choice to monitor fluid levels in non-metallic containers. An adjustable sensitivity potentiometer enables differentiation between materials, allowing BCS sensors to ignore the container, barriers, or mounting hardware to see the fluid inside.



### Package Content Detection with the BCS F50

A real workhorse on the packaging line, the BCS F50 detects conductive or non-conductive materials. This allows the sensor to tune out overwrap or packing containers in order to detect the product inside. Its target detection capability is unaffected by color variation, making it suitable for detecting a variety of products. Its "flat-pack" form factor is a must for production lines where space is at a premium.



### Accessories Deliver Faster Changeover Time

A common application, tank level control, is now simple with Balluff BCSA sight glass mounts. On and off levels can be easily adjusted on the external tube by moving the sensors up or down as desired. The ability to make these process changes quickly saves you money and satisfies the need for high-accuracy feedback.

# DC 3-Wire

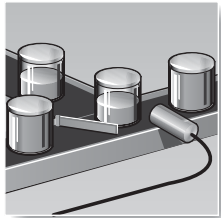
## Capacitive Proximity Sensors

DC 3-Wire  
M8  
s<sub>r</sub> 0.1...1.5 mm, 0.1...3 mm

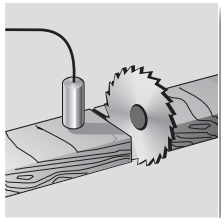
### More Applications



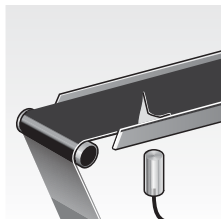
Following a metal thread in textiles.



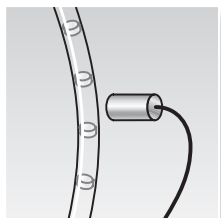
Confirmation of liquid level.



Sensing presence and thickness of lumber.



Inspecting paper or plastic strips. (Be sure no metal is behind target object.)



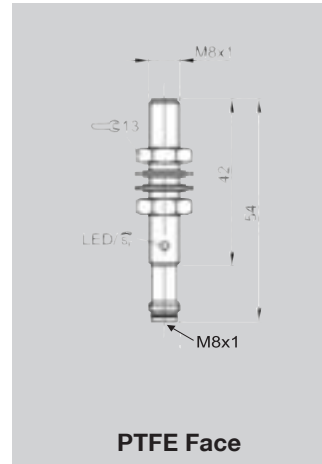
Detecting/counting plastic or metal parts moving through tubing.

Housing size	
Mounting	
Nominal Operating Distance s <sub>r</sub>	
Assured Operating Distance s <sub>a</sub>	

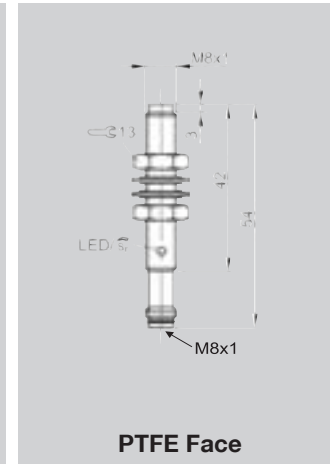


M8
flush
<b>0.1...1.5 mm</b>
0.1...1.2 mm

M8
non-flush*
<b>0.1...3 mm</b>
0.1...2.2 mm



PTFE Face



PTFE Face

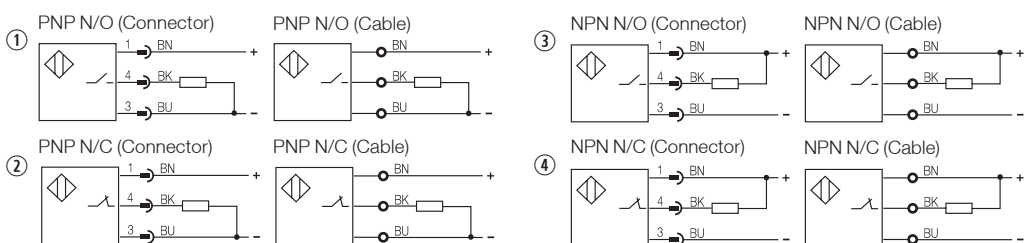
PNP	Normally-open ①	BCS M08EG1-PSC15C-S49G	BCS M08EG-PSC30G-S49G
	Normally-closed ②	BCS M08EG1-POC15C-S49G	BCS M08EG-POC30G-S49G

NPN	Normally-open ③	BCS M08EG1-NSC15C-S49G (1)	BCS M08EG-NSC30G-S49G (1)
	Normally-closed ④	BCS M08EG1-NOC15C-S49G (1)	BCS M08EG-NOC30G-S49G (1)

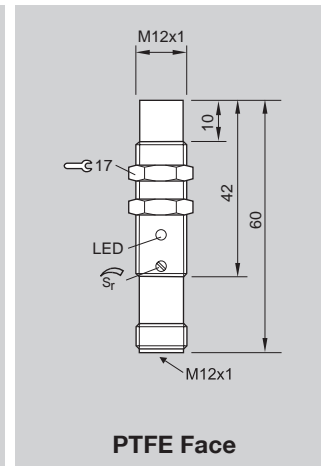
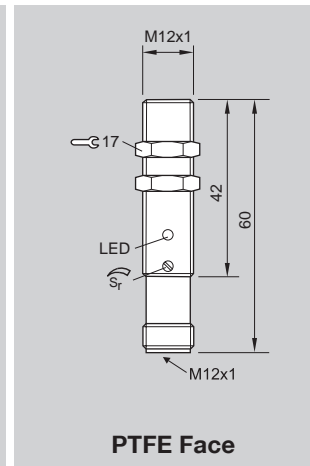
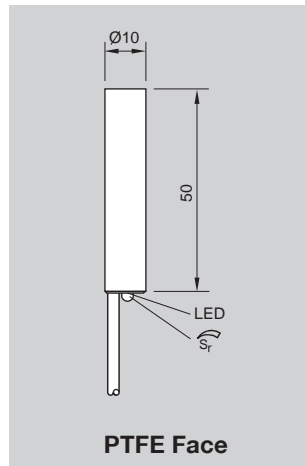
Rated Operational Voltage U <sub>e</sub>	24 Vdc	24 Vdc
Supply Voltage U <sub>B</sub>	11...30 Vdc	11...30 Vdc
Voltage Drop U <sub>d</sub> at I <sub>e</sub>	≤ 2.0 V	≤ 2.0 V
Insulation Rating U <sub>i</sub>	75 Vdc	75 Vdc
Rated Operational Current I <sub>e</sub>	50 mA	50 mA
No-Load Current Draw I <sub>o</sub>	≤ 10 mA	≤ 10 mA
Protected Against Short Circuit	yes	yes
Protected Against Reverse Polarity	yes	yes
Load Capacitance	≤ 1 µF	≤ 1 µF
Repeat Accuracy R	≤ 2%	≤ 2%
Ambient Temperature Range T <sub>a</sub>	-10...+70 °C	-10...+70 °C
Switching Frequency, max	100 Hz	100 Hz
Utilization Categories	DC 13	DC 13
LED Indicates	output on	output on
Degree of Protection per IEC 60529	IP 65	IP 65
Insulation Class	□	□
Housing Material	stainless steel	stainless steel
Sensing Face Material	PTFE	PTFE
Connection	M8 connector	M8 connector
No. of Wires × Gauge	N/A	N/A
Recommend Cable	C49 ANE-00-VY-050M	C49 ANE-00-VY-050M
Approvals	CE	CE

(1) Consult factory for availability. Subject to minimum order quantity.  
\* Flush mounting reduces the effective operating distance by 50%.

### Wiring Diagrams



Housing size	<b>Ø 10 mm</b>	<b>M12</b>	<b>M12</b>
Mounting	flush	flush	non-flush*
Nominal Operating Distance s <sub>r</sub>	<b>1...4 mm</b>	<b>1...4 mm</b>	<b>1...8 mm</b>
Assured Operating Distance s <sub>a</sub>	1...2.9 mm	1...2.9 mm	1...5.8 mm



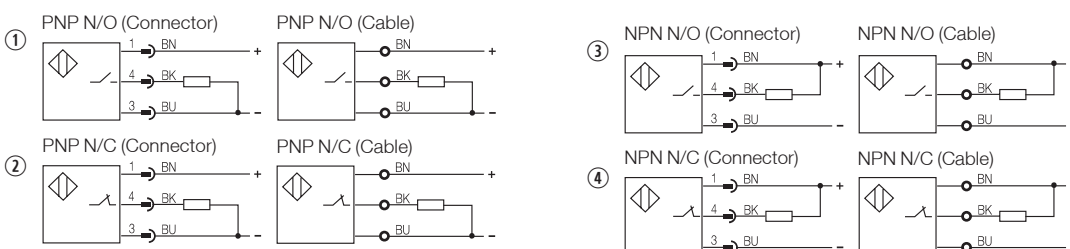
PNP	Normally-open ①	BCS 010-PSB-1-L-PU-02	BCS 012-PSB-1-L-S4	BCS 012-PS-1-L-S4
	Normally-closed ②	BCS 010-POB-1-L-PU-02	BCS 012-POB-1-L-S4	BCS 012-PO-1-L-S4

NPN	Normally-open ③	BCS 010-NSB-1-L-PU-02 (1)	BCS 012-NSB-1-L-S4 (1)	BCS 012-NS-1-L-S4 (1)
	Normally-closed ④	BCS 010-NOB-1-L-PU-02 (1)	BCS 012-NOB-1-L-S4 (1)	BCS 012-NO-1-L-S4 (1)

Rated Operational Voltage U <sub>e</sub>	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U <sub>B</sub>	12...35 Vdc	12...35 Vdc	12...35 Vdc
Voltage Drop U <sub>d</sub> at I <sub>e</sub>	≤ 1.0 V	≤ 1.0 V	≤ 1.0 V
Insulation Rating U <sub>i</sub>	75 Vdc	75 Vdc	75 Vdc
Rated Operational Current I <sub>e</sub>	200 mA	200 mA	200 mA
No-Load Current Draw I <sub>0</sub>	≤ 10 mA	≤ 10 mA	≤ 10 mA
Protected Against Short Circuit	yes	yes	yes
Protected Against Reverse Polarity	yes	yes	yes
Load Capacitance	≤ 1 µF	≤ 1 µF	≤ 1 µF
Repeat Accuracy R	≤ 5%	≤ 5%	≤ 5%
Ambient Temperature Range T <sub>a</sub>	-30...+70 °C	-30...+70 °C	-30...+70 °C
Switching Frequency, max	100 Hz	100 Hz	100 Hz
Utilization Categories	DC 13	DC 13	DC 13
LED Indicates	output on	output on	output on
Degree of Protection per IEC 60529	IP 65	IP 65	IP 65
Insulation Class	□	□	□
Housing Material	stainless steel	nickel plated brass	nickel plated brass
Sensing Face Material	PTFE	PTFE	PTFE
Connection	2m PUR cable	M12 connector	M12 connector
No. of Wires x Gauge	3 x 22 AWG (3 x 0.34mm <sup>2</sup> )	N/A	N/A
Recommend Cable	N/A	C04 AEL-00-TY-050M	C04 AEL-00-TY-050M
Approvals	CE	CE	CE

(1) Consult factory for availability. Subject to minimum order quantity.  
\* Flush mounting reduces the effective operating distance by 50%.

## Wiring Diagrams

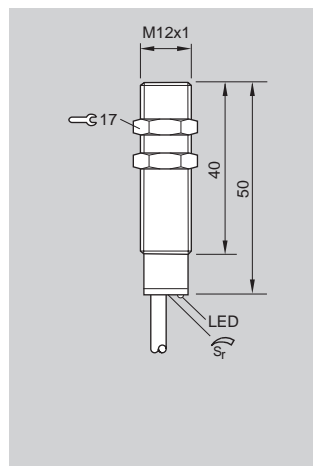


# DC 3-Wire

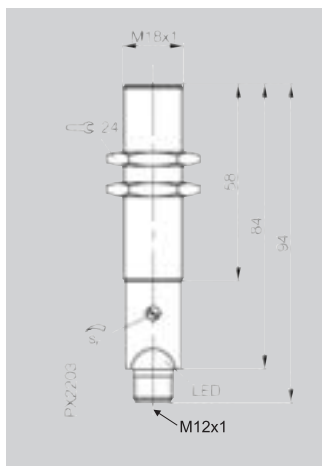
## Capacitive Proximity Sensors

DC 3-Wire  
M12, M18  
S<sub>r</sub> 1...4 mm, 1...8 mm,  
1...15 mm

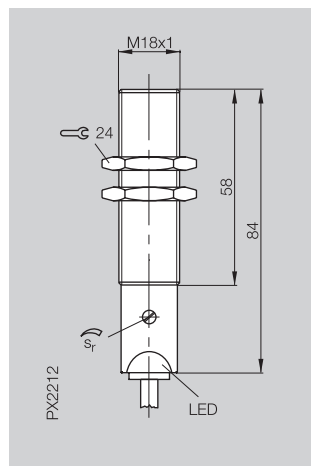
<b>M12</b>
flush
<b>1...4 mm</b>
1...3.2 mm



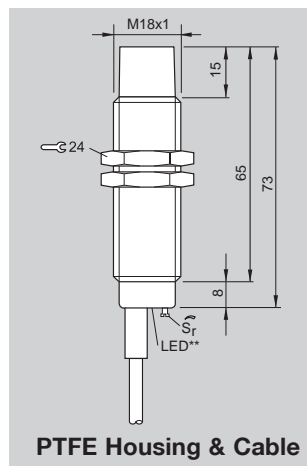
<b>M18</b>
flush
<b>1...8 mm</b>
0.7...6.5 mm



<b>M18</b>
flush
<b>1...8 mm</b>
0.7...6.5 mm



<b>M18</b>
non-flush*
<b>1...15 mm</b>
0.8...12 mm

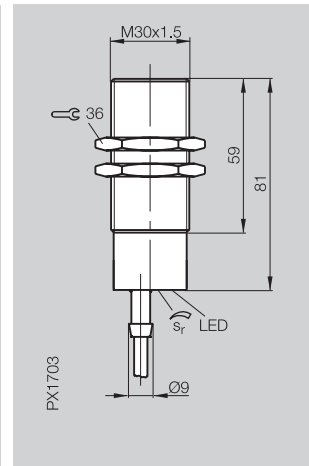
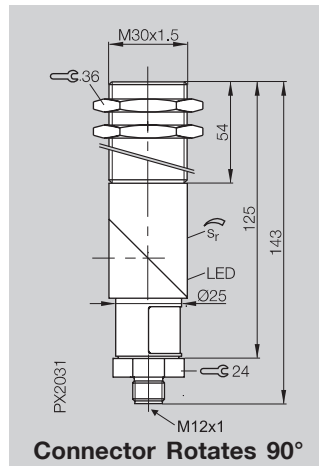


PTFE Housing & Cable

BCS 012-PS-1-Y-02 BCS 012-PO-1-Y-02	BCS M18KM3-PSC80G-S04G BCS M18KM3-POC80G-S04G-001	BCS M18KM3-PSC80G-BV02 BCS M18KM3-POC80G-BV02	BCS M18PI-PSC15F-BT02 BCS M18PI-POC15F-BT02
BCS 012-NS-1-Y-02 <sup>(1)</sup> BCS 012-NO-1-Y-02 <sup>(1)</sup>		BCS M18KM3-NSC80G-BV02 BCS M18KM3-NOC80G-BV02	BCS M18PI-NSC15F-BT02 BCS M18PI-NOC15F-BT02
24 Vdc	24 Vdc	24 Vdc	24 Vdc
12...35 Vdc	10...36 Vdc	10...36 Vdc	10...36 Vdc
≤ 1.0 V	≤ 2.5 V	≤ 2.5 V	≤ 1.5 V
75 Vdc	250 Vac	250 Vac	
200 mA	250 mA	250 mA	300 mA
≤ 10 mA	≤ 15 mA	≤ 15 mA	≤ 15 mA
yes	yes	yes	yes
yes	yes	yes	yes
≤ 1 μF	≤ 0.1 μF	≤ 0.1 μF	≤ 1 μF
≤ 5%	≤ 10%	≤ 10%	≤ 2%
-30...+70 °C	-25...+80 °C	-25...+80 °C	-30...+70 °C
100 Hz	50 Hz	50 Hz	100 Hz
DC 13	DC 13	DC 13	DC 13
output on	output on	output on	output on
IP 65	IP 67	IP 67	IP 67
□	□	□	□
PVC	PBT	PBT	PTFE
PVC	PBT	PBT	PTFE
2m PUR cable	M12 connector	2m PVC cable	2m PTFE jacketed cable
3 x 22 AWG (3 x 0.34mm <sup>2</sup> )	N/A	3 x 22 AWG (3 x 0.34mm <sup>2</sup> )	3 x 24 AWG (3 x 0.23mm <sup>2</sup> )
N/A	C04 AEL-00-TY-050M	N/A	N/A
CE	CE, cULus	CE, cULus	CE



Housing size	<b>M30</b>	<b>M30</b>
Mounting	flush	flush
Nominal Operating Distance s <sub>r</sub>	<b>2...15 mm</b>	<b>2...15 mm</b>
Assured Operating Distance s <sub>a</sub>	1.4...12.1 mm	1.4...10.8 mm



PNP	Normally-open ①		BCS M30KN2-PSC18G-AV02
	Normally-closed ②		BCS M30KN2-POC15G-AV02
	Selectable ⑤	BCS M30KM7-PPH15G-S04U	
NPN	Normally-open ③		BCS M30KN2-NSC18G-AV02
	Normally-closed ④		BCS M30KN2-NOC15G-AV02
Rated Operational Voltage U <sub>e</sub>		24 Vdc	24 Vdc
Supply Voltage U <sub>B</sub>		10...36 Vdc	10...36 Vdc
Voltage Drop U <sub>d</sub> at I <sub>e</sub>		≤ 2.5 V	≤ 2.5 V
Insulation Rating U <sub>i</sub>		250 Vac	250 Vac
Rated Operational Current I <sub>e</sub>		250 mA	250 mA
No-Load Current Draw I <sub>o</sub>		≤ 16 mA	≤ 15 mA
Protected Against Short Circuit		yes	yes
Protected Against Reverse Polarity		yes	yes
Load Capacitance		≤ 0.1 μF	≤ 0.1 μF
Repeat Accuracy R		≤ 10%	≤ 10%
Ambient Temperature Range T <sub>a</sub>		-25...+70 C	-25...+70 C
Switching Frequency, max		40 Hz	40 Hz
Utilization Categories		DC 13	DC 13
LED Indicates		output on	output on
Degree of Protection per IEC 60529		IP 65	IP 67
Insulation Class		□	□
Housing Material		PBT	PBT
Sensing Face Material		PBT	PBT
Connection		M12 connector	2m PVC cable
No. of Wires × Gauge		N/A	3 x 22 AWG (3 x 0.34mm²)
Recommend Cable		C04 AEL-00-TY-050M	N/A
Approvals		CE, cULus	CE, cULus

Connector portion of sensor body can be rotated 90°.

(1) Consult factory for availability. Subject to minimum order quantity.  
\* Flush mounting reduces the effective operating distance by 50%.

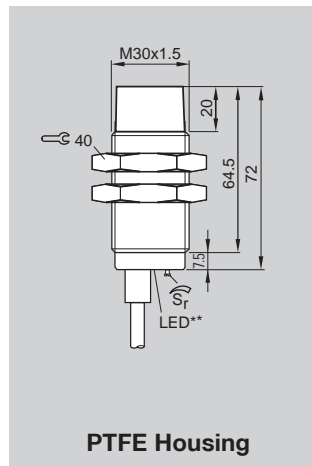


# DC 3-Wire

## Capacitive Proximity Sensors

DC 3-Wire  
M30, Ø 34 mm  
s<sub>r</sub> 0.5...30 mm, 3...20 mm

M30
non-flush*
<b>0.5...30 mm</b>
0.4...24 mm

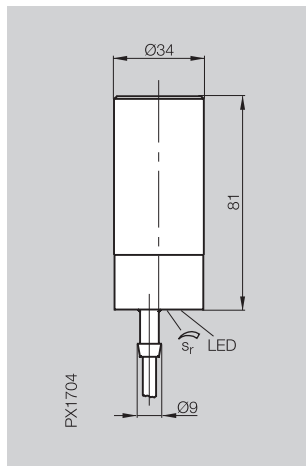


BCS M30PH1-PSC30F-BT02
BCS M30PH1-POC30F-BT02

BCS M30PH1-NSC30F-BT02
BCS M30PH1-NOC30F-BT02

24 Vdc
10...36 Vdc
≤ 2.5 V
250 Vac
250 mA
≤ 15 mA
yes
yes
≤ 0.1 µF
≤ 10%
-30...+70 °C
100 Hz
DC 13
output on
IP 67
□
PTFE
PTFE
2m PTFE jacketed cable
3 x 24 AWG (3 x 0.23mm²)
N/A
CE

Ø 34 mm
flush
<b>3...20 mm</b>
2.2...16.2 mm



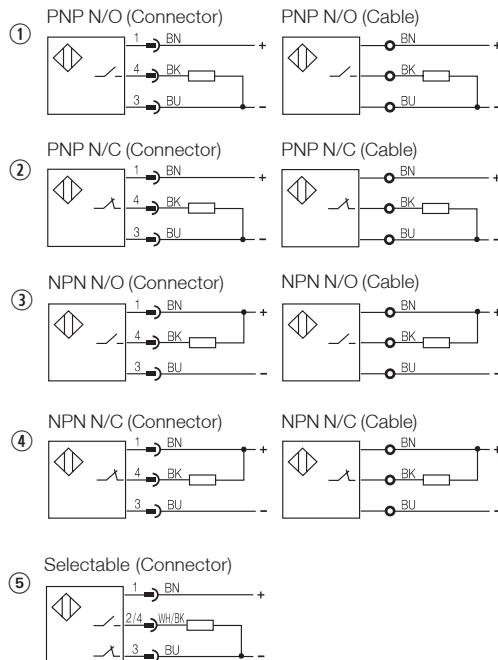
BCS G34KN2-PSC24G-AV02
BCS G34KN2-POC20G-AV02

BCS G34KN2-NSC24G-AV02
BCS G34KN2-NOC20G-AV02

24 Vdc
10...36 Vdc
≤ 2.5 V
250 Vac
250 mA
≤ 15 mA
yes
yes
≤ 0.1 µF
≤ 10%
-25...+70 °C
40 Hz
DC 13
output on
IP 65
□
PBT
PBT
2m PVC cable
3 x 22 AWG (3 x 0.34mm²)
N/A
CE, cULus

Mounting hardware included.

### Wiring Diagrams



The sensor comes factory set to normally-open. By cutting the jumper wire inside the back cover, the sensor will be set to normally-closed.

**Note:** This is a one-time operation. The sensor cannot be returned to normally-open operation.

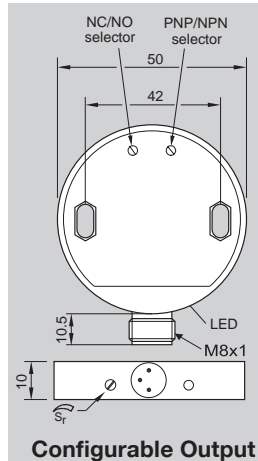
**Ideal for  
level control**



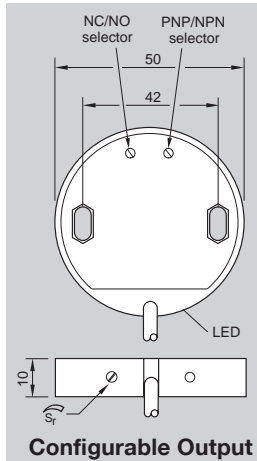
Housing size	Ø 50 mm flat style	Ø 50 mm flat style	34x16x8 mm Minisensor	34x16x8 mm Minisensor
Mounting	flush	flush	flush	flush
Nominal Operating Distance s <sub>r</sub>	2...25 mm	2...25 mm	1...8 mm	<b>Self-adapting</b>
Assured Operating Distance s <sub>a</sub>	1.6...20 mm	1.6...20 mm	0.8...6.4 mm	0.8...6.4 mm



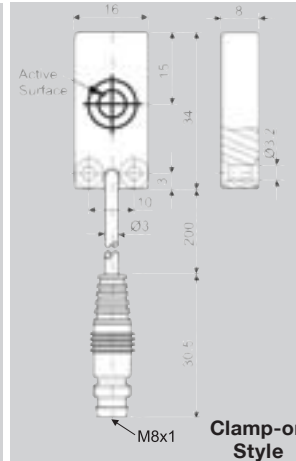
"Thin" form factor



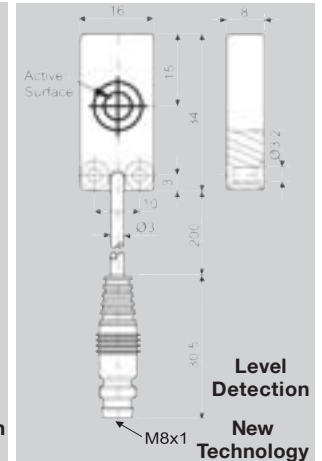
Configurable Output



Configurable Output



Clamp-on Style



Level Detection New Technology

PNP	Normally-open ①			BCS R08KE-PSC80C-EP00.2-GS49	BCS R08KE-PSCFAC-EP00.2-GS49
	Normally-closed ②			BCS R08KE-POC80C-EP00.2-GS49	BCS R08KE-POCFAC-EP00.2-GS49
	Selectable ⑥	BCS F50-GA-1-Y-S49	BCS F50-GA-1-Y-PU-02		

NPN	Normally-open ③			BCS R08KE-NSC80C-EP00.2-GS49 (1)	
	Normally-closed ④			BCS R08KE-NOC80C-EP00.2-GS49 (1)	
	Selectable ⑥	BCS F50-GA-1-Y-S49	BCS F50-GA-1-Y-PU-02		

Rated Operational Voltage U <sub>e</sub>	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Supply Voltage U <sub>B</sub>	10...30 Vdc	10...30 Vdc	12...30 Vdc	12...30 Vdc
Voltage Drop U <sub>d</sub> at I <sub>e</sub>	≤ 3.5 V	≤ 3.5 V	≤ 1.5 V	≤ 1.5 V
Insulation Rating U <sub>i</sub>	75 Vdc	75 Vdc	75 Vdc	75 Vdc
Rated Operational Current I <sub>e</sub>	150 mA	150 mA	50 mA	50 mA
No-Load Current Draw I <sub>o</sub>	≤ 15 mA	≤ 15 mA	≤ 10 mA	≤ 10 mA
Protected Against Short Circuit	yes	yes	yes	yes
Protected Against Reverse Polarity	yes	yes	yes	yes
Load Capacitance	≤ 1 µF	≤ 1 µF	≤ 1 µF	≤ 1 µF
Repeat Accuracy R	≤ 2%	≤ 2%	≤ 5%	≤ 5%
Ambient Temperature Range T <sub>a</sub>	-30...+60 °C	-30...+60 °C	-30...+70 °C	-30...+70 °C
Switching Frequency, max	50 Hz	50 Hz	100 Hz	2 Hz
Utilization Categories	DC 13	DC 13	DC 13	DC 13
LED Indicates	output on	output on	output on	output on
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67	IP 67
Insulation Class	□	□	□	□
Housing Material	POM	POM	PP	PP
Sensing Face Material	POM	POM	PP	PP
Connection	M8 connector	2m PUR cable	M8 pigtail connector	M8 pigtail connector
No. of Wires x Gauge	N/A	3 x 24 AWG (3 x 0.23 mm <sup>2</sup> )	N/A	N/A
Recommend Cable	C49A or C49B	N/A	C49 ANE-00-VY-050M	C49 ANE-00-VY-050M
Approvals	CE	CE	CE	CE

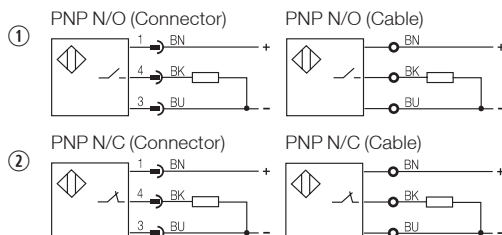
(1) Consult factory for availability. Subject to minimum order quantity.  
 \* Flush mounting reduces the effective operating distance by 50%.

Mounting hardware included.

Mounting hardware included.

## Wiring Diagrams

See page 4.11 for additional wiring diagrams ③-⑥.



BCS R08KE mounted to a tube with wire ties



The BCS self-adapting minisensor uses new technology to detect water based conductive liquid levels in non-metallic vessels. This sensor compensates for filming, material build-up, and foaming virtually without adjustment. The self-adapting sensor is not designed for leakage detection, small quantities of liquids, or level detection of non-conductive liquids or solids.

# AC/DC 2-Wire

## Capacitive Proximity Sensors

AC/DC 2-Wire  
M18, M30, Ø 34 mm  
S<sub>r</sub> 1...8 mm, 2...15 mm,  
3...20 mm

## Capacitive

## 4

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Selection Guide

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DC 3-Wire

AC/DC 2-Wire

Accessories

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Connectors

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Accessories

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Technical Reference

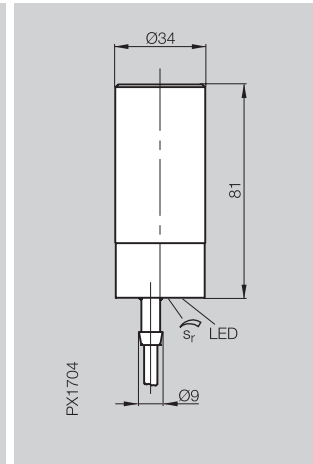
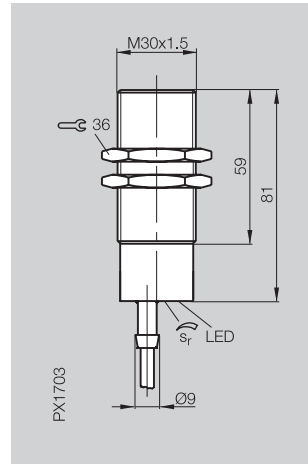
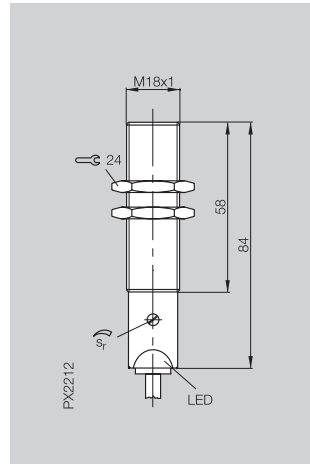
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Part Number Index

Housing size	<b>M18</b>
Mounting	flush
Nominal Operating Distance s <sub>r</sub>	<b>1...8 mm</b>
Assured Operating Distance s <sub>a</sub>	0.7...6.5 mm

Housing size	<b>M30</b>
Mounting	flush
Nominal Operating Distance s <sub>r</sub>	<b>2...15mm</b>
Assured Operating Distance s <sub>a</sub>	1.4... 12.1 mm

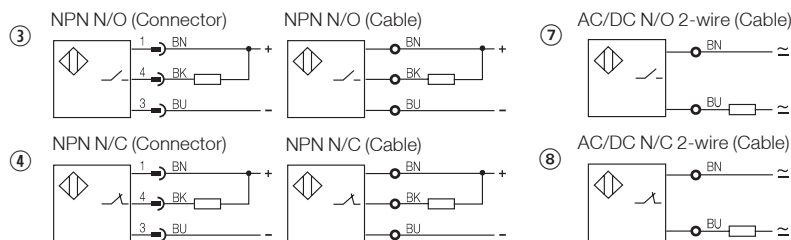
Housing size	<b>Ø 34 mm</b>
Mounting	flush
Nominal Operating Distance s <sub>r</sub>	<b>3...20 mm</b>
Assured Operating Distance s <sub>a</sub>	2.2...16 mm



Normally-open ⑦	BCS M18KM3-UST80G-BV02	BCS M30KN2-UST15G-AV02	BCS G34KN2-UST20G-AV02
Normally-closed ⑧	BCS M18KM3-UOT80G-BV02	BCS M30KN2-UOT15G-AV02	BCS G34KN2-UOT20G-AV02
Rated Operational Voltage U <sub>e</sub>	110 Vac	110 Vac	110 Vac
Supply Voltage U <sub>B</sub>	20...250 Vac/Vdc	20...250 Vac/Vdc	20...250 Vac/Vdc
Voltage Drop U <sub>d</sub> at I <sub>e</sub>	≤ 8 V	≤ 8 V	≤ 8 V
Insulation Rating U <sub>i</sub>	250 Vac	250 Vac	250 Vac
Rated Operational Current I <sub>e</sub>	250 mA AC/ 100 mA DC	250 mA AC/ 100 mA DC	250 mA AC/ 100 mA DC
No-Load Current Draw I <sub>o</sub>	≤ 4 mA	≤ 5 mA	≤ 5 mA
Protected Against Short Circuit	no	no	no
Protected Against Reverse Polarity	no	no	no
Load Capacitance	N/A	N/A	N/A
Repeat Accuracy R	≤ 15%	≤ 15%	≤ 15%
Ambient Temperature Range T <sub>a</sub>	-25...+80 C	-25...+70 C	-25...+70 C
Switching Frequency, max	25 Hz AC/50 Hz DC	25 Hz AC/50 Hz DC	25 Hz AC/50 Hz DC
Utilization Categories	AC 140/DC 13	AC 140/DC 13	AC 140/DC 13
LED Indicates	output on	output on	output on
Degree of Protection per IEC 60529	IP 67	IP 67	IP 67
Insulation Class	□	□	□
Housing Material	PBT	PBT	PBT
Sensing Face Material	PBT	PBT	PBT
Connection	2m PVC cable	2m PVC cable	2m PVC cable
No. of Wires x Gauge	3 x 22 AWG (3 x 0.34mm <sup>2</sup> )	3 x 22 AWG (3 x 0.34mm <sup>2</sup> )	3 x 22 AWG (3 x 0.34mm <sup>2</sup> )
Recommend Cable	N/A	N/A	N/A
Approvals	CE, cULus	CE, cULus	CE, cULus

Mounting hardware included.

### Wiring Diagrams



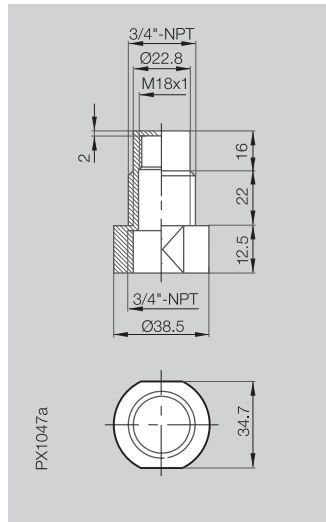
- ⑥ PNP/NPN NO/NC Selectable (Connector or Cable)  
The BCS F50-GA models come factory set for PNP N/O operation. Each sensor has selector switches that allow users to select wiring types ① through ④.

Fits
Mounting - switchwell
Mounting - sensor
Material

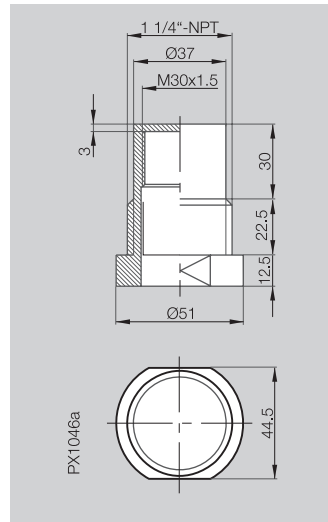
Protective switchwells available for bulk and liquid level detection applications. Mounting through the container wall means quick adjustment or replacement of the sensor without having to empty the tank.



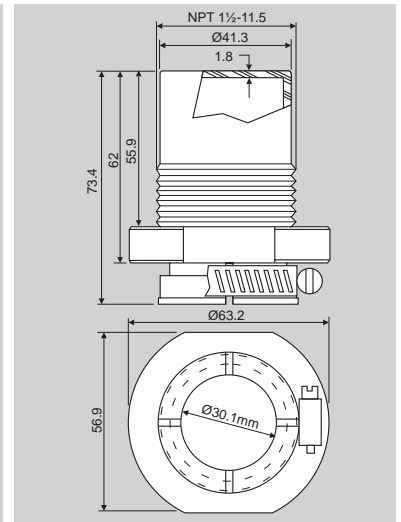
M18
3/4" NPT with wrench flats
M18 inside threaded
PTFE



M30
1-1/4" NPT with wrench flats
M30 inside threaded
PTFE

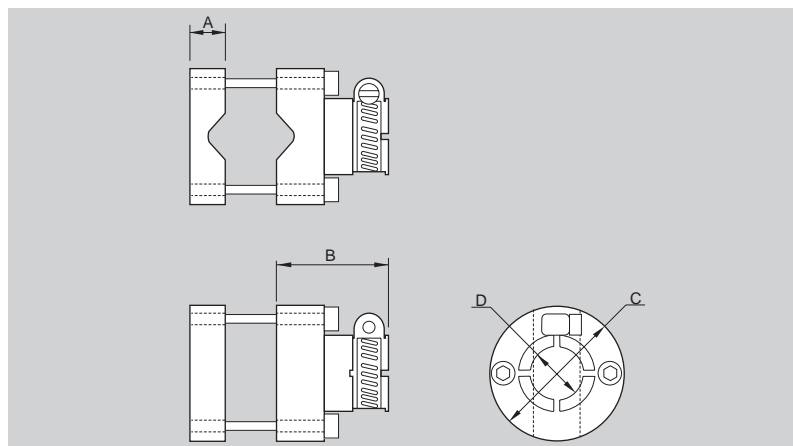


M30
1-1/2" NPT with wrench flats
Oversized M30, held with band clamp
Lexan



Ordering code	BES 18-SM-3	BES 30-SM-3	BES 30-SM-5
Sensing distance	Reduced by the thickness of the switchwell	Reduced by the thickness of the switchwell	Reduced by the thickness of the switchwell
Thickness in front of sensor	2.0 mm	3.0 mm	1.8 mm
Pressure rating	200 psi (13 bar)	200 psi (13 bar)	200 psi (13 bar)
Mounting through metal wall	Maintain 2xSr minimum from inside wall surface to face of sensor	Maintain 2xSr minimum from inside wall surface to face of sensor	Maintain 2xSr minimum from inside wall surface to face of sensor

Fits	M12	M18	M30	Ø 34 mm
Mounting - bracket	Split halves clamped with screws			
Mounting - sensor	Hose clamp			
Material	Plastic and stainless steel			



For mounting to sight glass or tubing for level detection.

**Note:** Refer to the accessories section for a complete selection of standard clamps and mounting brackets.

Ordering code	BCSA-SG-12-D	BCSA-SG-18-D	BCSA-SG-30-D	BCSA-SG-34-D
Dimensions (mm)				
A	10.5	11.7	19.1	19.1
B	29.5	38.1	67.8	67.8
C	38.1	45.0	69.9	69.9
D	12.1	18.1	30.1	34.1
Tube diameter (mm)	9.4-20.6	9.4-20.6	25.4-44.5	25.4-44.5
Tube diameter (inches)	0.37-0.81	0.37-0.81	1.0-1.75	1.0-1.75