

Global Products

General-purpose sensors and accessories for industrial automation



Balluff North America



Florence, Kentucky USA

Balluff's Florence, Kentucky United States headquarters is located just south of Cincinnati, Ohio. Our customers are in industries such as automotive, machine tool, robotics, injection molding, packaging, material handling, and more.

In addition to sales, marketing, and logistic functions, this facility manufactures Micropulse® magnetostrictive linear position sensors and warehouses over 60,000 products.

The Balluff Global Network

Balluff spans the globe with representation in 49 countries.



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Service

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- Comprehensive product selection, cross reference, and application assistance.
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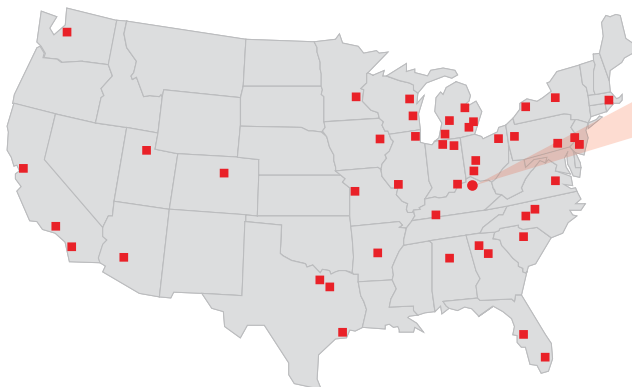
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Our premier distributor network can quickly assist with applications and order fulfillment.

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⚠ WARNING

- Read, understand, and follow warnings and manual. Failure to do so could result in serious injury or death.
- NEVER USE AS A SENSING DEVICE FOR PERSONNEL PROTECTION
- Does NOT include self-checking redundancy circuitry required for use in personnel safety applications
- Does NOT meet OSHA and ANSI standards for point-of-operation devices

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Performance and Value in Inductive Proximity Sensors

Balluff's economical line of inductive proximity sensors offers a broad range of top-quality, performance proven products. The family includes a wide array of tubular M8, M12, M18, and M30 sensors available in 3-wire DC and 2-wire DC models. Built to the same high standards as all Balluff inductive proximity sensors, these sensors are 100% tested to guarantee conformance to critical published specifications. This attention to quality and performance ensures all models provide years of worry-free, reliable operation which increases production run time and decreases maintenance costs.

Advances in integrated circuit technology and high volume production techniques enable Balluff to offer superior quality products at value pricing. These sensors also carry international approvals to meet the demands of a global customer base. All sensors are CE marked, cULus listed, and are backed by Balluff's standard lifetime warranty.

Product Family Improvements

- **3-wire DC PNP and NPN models provide more choice for control variations**
- **Metal porthole LED connector versions with robust connectors for rugged applications**
- **Extended range "shorty" 2-Wire DC normally-closed outputs for small spaces**

Features

- **Convenience – most models stocked for same day delivery**
- **Variety – 2 wire DC, 3 wire DC, flush/non-flush models, connectorized or cable out, M8 to M30 sizes**
- **Reliability – protected from short circuits, voltage surges, polarity reversal and current overload**
- **Quality – 100% tested, lifetime warranty**



Standard Specifications

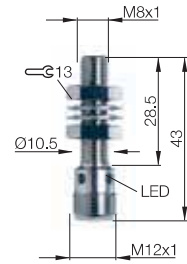
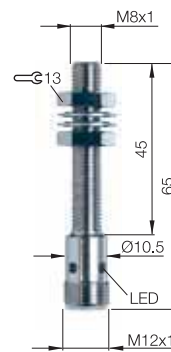
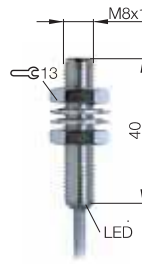
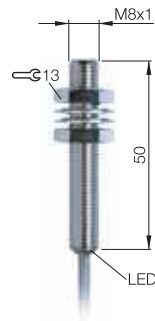
Rated supply voltage	24 V DC
Supply voltage range	10...30 V DC, 12...30 V DC, or 10...36 V DC
Max. load current	100 mA, 130 mA, or 200 mA
Short circuit protection	Yes
Current overload protection	Yes
Voltage surge protection	Yes
Polarity reversal protection	Yes
Degree of protection	IP67 or IP68
Temperature range	-25° C...+70° C
Approvals	CE and cULus

Cable lengths may vary per model.
Consult factory for all available models.

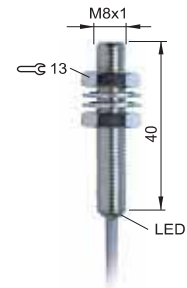
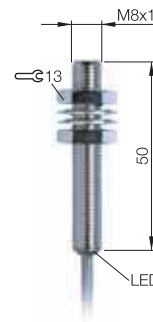
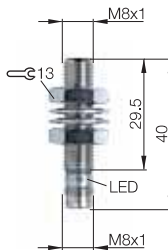


Balluff Global – Inductive

DC 3-wire – M8



Housing size	M8x1		M8x1	M8x1	M8x1
Mounting	Flush		Flush	Flush	Flush
Rated operating distance Sn	1.5 mm		1.5 mm	1.5 mm	1.5 mm
Assured operating distance Sa	0...1.2 mm		0...1.2 mm	0...1.2 mm	0...1.2 mm
Cable length and material	3m PVC	3m PUR	3m PUR		
PNP Normally open	BES0038	BES0035	BES00CU	BES0027	BES00CH
PNP Normally closed	BES0031	BES002Y	BES00CR	BES0026	BES00CA
NPN Normally open	BES002H	BES002A	BES00CN	BES0024	BES00C6
NPN Normally closed	BES03PJ		BES00CL	BES0023	BES00C2



Housing size	M8x1		M8x1	M8x1	M8x1
Mounting	Flush		Flush	Flush	Flush
Rated operating distance Sn	1.5 mm		1.5 mm	2 mm	2 mm
Assured operating distance Sa	0...1.2 mm		0...1.2 mm	0...1.6 mm	0...1.6 mm
Cable length and material				3m PVC	3m PUR
PNP Normally open	BES003C	BES00CJ	BES003L	BES003H	BES00CW
PNP Normally closed	BES03P6	BES00CC	BES03TH		BES00CT
NPN Normally open	BES002K	BES00C7	BES002R	BES002M	BES00CP
NPN Normally closed	BES03PK	BES00C3	BES03TF		BES00CM

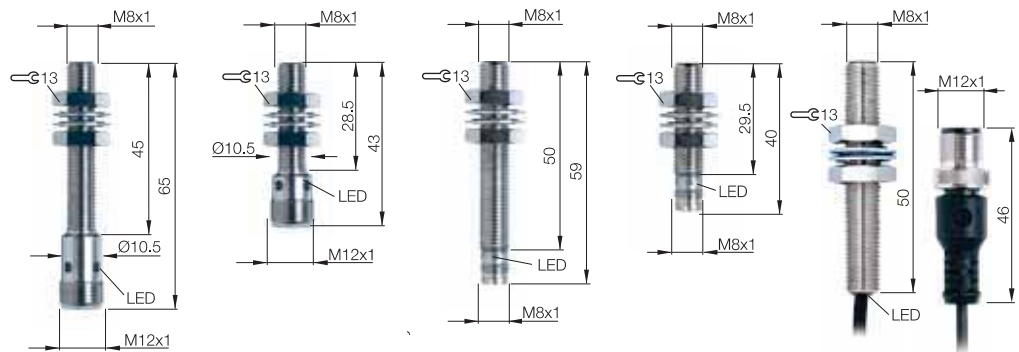
Sensing Distance

Sensing Distance

Refer to Balluff website for latest technical information.

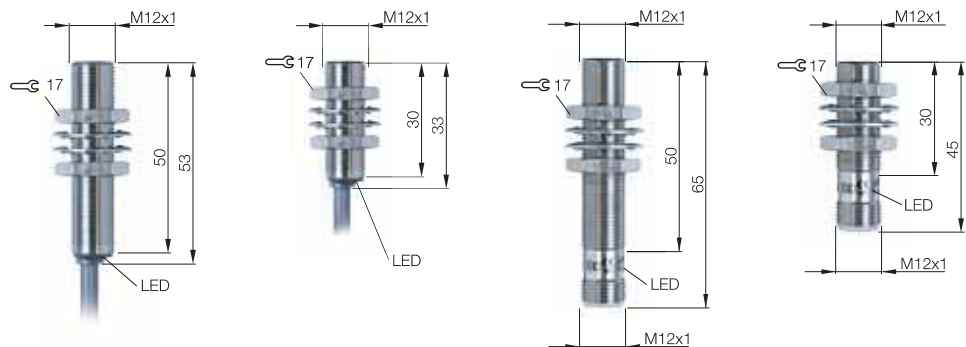
Balluff Global – Inductive

DC 3-wire – M8 and M12



Sensing Distance **Sensing Distance** **Sensing Distance** **Sensing Distance** **Sensing Distance**

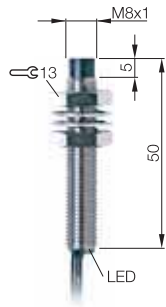
Housing size	M8x1	M8x1	M8x1	M8x1	M8x1	
Mounting	Flush	Flush	Flush	Flush	Flush	
Rated operating distance Sn	2 mm	2 mm	2 mm	2 mm	2 mm	
Assured operating distance Sa	0...1.6 mm	0...1.6 mm	0...1.6 mm	0...1.6 mm	0...1.6 mm	
Cable length and material					.2m PUR	
PNP Normally open	BES0028	BES00FC	BES003P	BES00CK	BES003E	
PNP Normally closed	BES03T5	BES00CE	BES0033	BES00CF		
NPN Normally open	BES0025	BES00C8	BES002U	BES00C9		
NPN Normally closed	BES03T6	BES00C4	BES03TJ	BES00C5		



Housing size	M12x1	M12x1	M12x1	M12x1	
Mounting	Flush	Flush	Flush	Flush	
Rated operating distance Sn	2 mm	2 mm	2 mm	2 mm	
Assured operating distance Sa	0...1.6 mm	0...1.6 mm	0...1.6 mm	0...1.6 mm	
Cable length and material	2m PVC	3m PUR	2m PUR		
PNP Normally open	BES005U	BES005R	BES00E4	BES0060	BES00EE
PNP Normally closed	BES00FP	BES005A	BES00E2	BES005F	BES00EA
NPN Normally open	BES00FL	BES0050	BES00E0	BES0054	BES00E8
NPN Normally closed	BES03PR		BES00CY	BES004Y	BES00E6

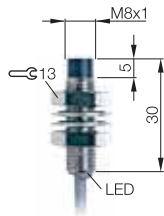
Balluff Global – Inductive

DC 3-wire – M8 and M12



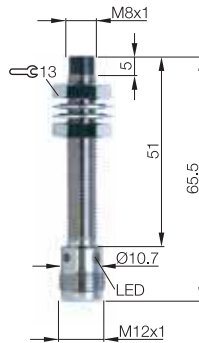
Sensing Distance

M8x1	
Non-flush	
4 mm	
0...3.2 mm	
2m PVC	2m PUR
BES0017	BES0016
BES0015	BES0014
BES0013	BES0012
BES0011	BES0010



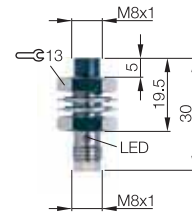
Sensing Distance

M8x1	
Non-flush	
4 mm	
0...3.2 mm	
2m PVC	2m PUR
BES000Z	BES000Y
BES000W	BES000U
BES000T	BES000R
BES000P	BES000N



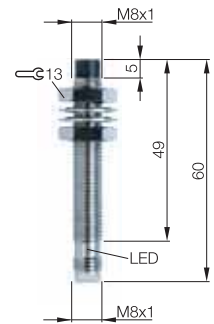
Sensing Distance

M8x1
Non-flush
4 mm
0...3.2 mm
BES001H
BES001E
BES001A
BES0018



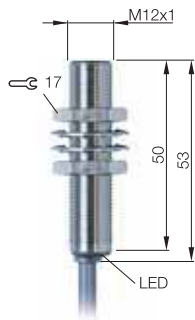
Sensing Distance

M8x1
Non-flush
4 mm
0...3.2 mm
BES000M
BES000L
BES000K
BES000J



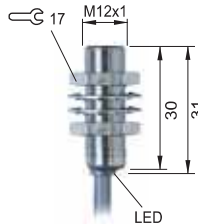
Sensing Distance

M8x1
Non-flush
4 mm
0...3.2 mm
BES001J
BES001F
BES001C
BES0019



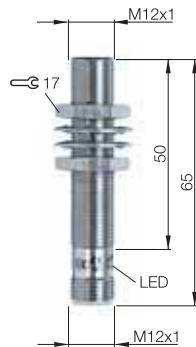
Sensing Distance

M12x1		
Flush		
4 mm		
0...3.2 mm		
2m PVC	3m PVC	3m PUR
	BES0001	BES0062
	BES005M	BES005J
	BES0057	
BES03PT		BES0055



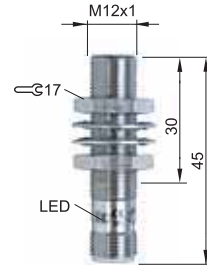
Sensing Distance

M12x1
Flush
4 mm
0...3.2 mm
2m PUR
BES0005
BES0003
BES0001
BES00CZ



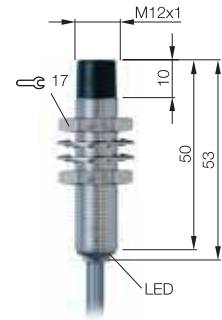
Sensing Distance

M12x1
Flush
4 mm
0...3.2 mm
BES0068
BES005N
BES0059
BES004Z



Sensing Distance

M12x1
Flush
4 mm
0...3.2 mm
BES000EF
BES000EC
BES000E9
BES000E7



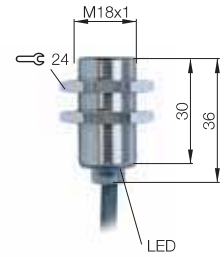
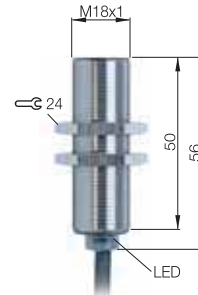
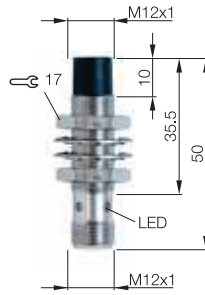
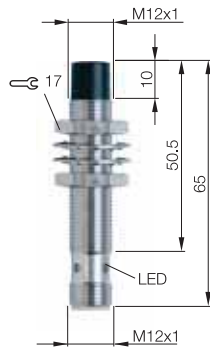
Sensing Distance

M12x1	
Non-flush	
8 mm	
0...6.5 mm	
2m PVC	2m PUR
BES004M	BES004L
BES004J	BES004H
BES004E	
BES0049	BES0048

Refer to Balluff website for latest technical information.

Balluff Global – Inductive

DC 3-wire – M12 and M18

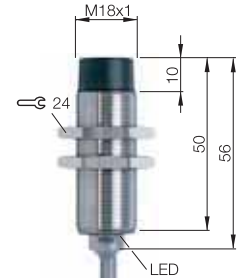
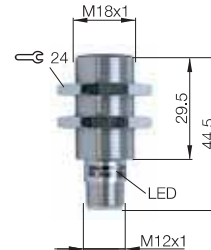
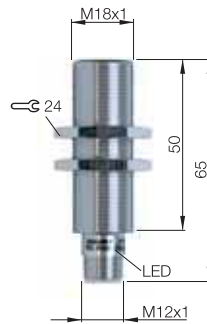
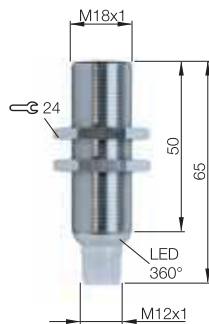


Sensing Distance



Sensing Distance

Housing size	M12x1	M12x1	M18x1	M18x1	
Mounting	Non-flush	Non-flush	Flush	Flush	
Rated operating distance Sn	8 mm	8 mm	5 mm	5 mm	
Assured operating distance Sa	0...6.5 mm	0...6.5 mm	0...4.1 mm	0...4.1 mm	
Cable length and material			3m PVC	3m PUR	2m PUR
PNP Normally open	BES004N	BES01PY	BES0083	BES0080	BES000EN
PNP Normally closed	BES004K	BES01PU	BES007T	BES007P	BES000EL
NPN Normally open	BES004F	BES01PT	BES007C	BES0078	BES000EJ
NPN Normally closed	BES004A	BES01PR	BES03RR		BES03T8



Sensing Distance



Sensing Distance



Sensing Distance

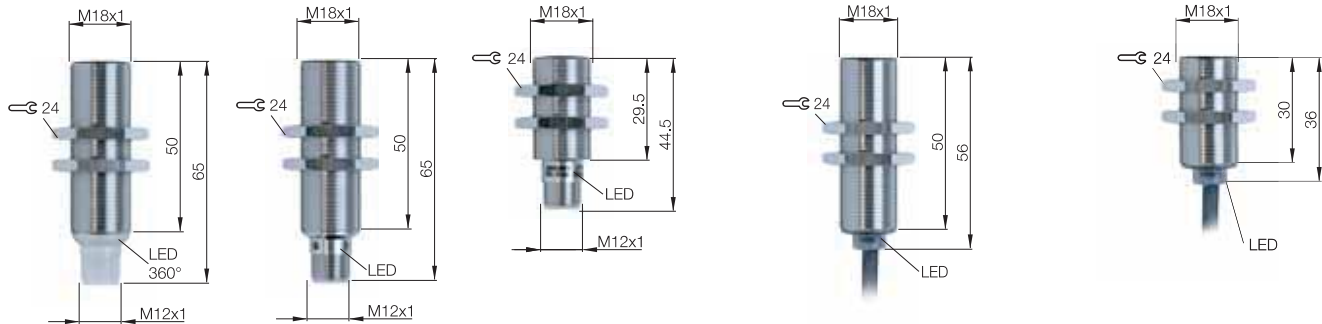


Sensing Distance

Housing size	M18x1	M18x1	M18x1	M18x1	
Mounting	Flush	Flush	Flush	Non-flush	
Rated operating distance Sn	8 mm	8 mm	8 mm	16 mm	
Assured operating distance Sa	0...6.5 mm	0...6.5 mm	0...6.5 mm	0...12.8 mm	
Cable length and material				2m PVC	2m PUR
PNP Normally open	BES008M	BES008L	BES000EZ	BES006Z	BES006Y
PNP Normally closed	BES007Y	BES03RP	BES000EW	BES006U	BES006T
NPN Normally open	BES007M	BES007L	BES000ET	BES006P	BES006N
NPN Normally closed	BES03T9	BES0077	BES03RN	BES006L	BES006K

Balluff Global – Inductive

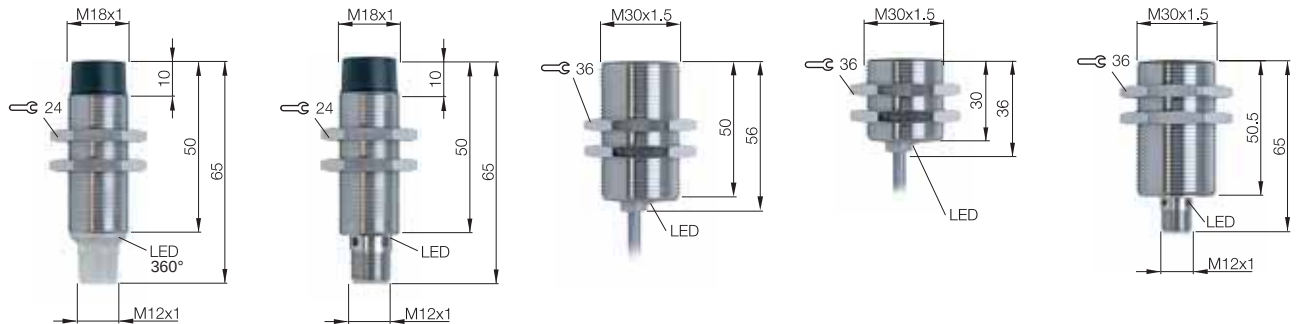
DC 3-wire – M18 and M30



Sensing Distance

Sensing Distance

M18x1	M18x1	M18x1	M18x1	M18x1	M18x1	M18x1	M18x1
Flush	Flush	Flush	Flush	Flush	Flush	Flush	Flush
5 mm	5 mm	5 mm	5 mm	8 mm	8 mm	8 mm	8 mm
0...4.1 mm	0...4.1 mm	0...4.1 mm	0...4.1 mm	0...6.5 mm	0...6.5 mm	0...6.5 mm	0...6.5 mm
				2m PVC	3m PVC	3m PUR	5m PUR
BES0087	BES0086	BES00EY	BES008F	BES0089	BES00EP	BES0089	BES00EP
BES007W		BES00EU	BES03PY		BES00EM	BES03PM	BES00EM
BES007F		BES00ER	BES007J	BES007H	BES00EK		BES00EK
BES0076		BES03T7	BES03T4				



Sensing Distance

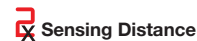
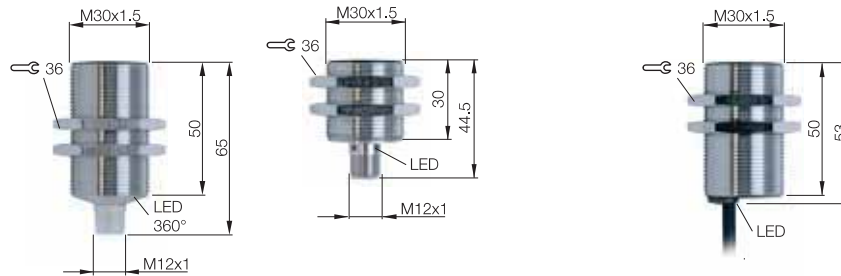
Sensing Distance

M18x1	M18x1	M30x1.5	M30x1.5	M30x1.5
Non-flush	Non-flush	Flush	Flush	Flush
16 mm	16 mm	10 mm	10 mm	10 mm
0...12.8 mm	0...12.8 mm	0...8.1 mm	0...8.1 mm	0...8.1 mm
		2m PVC	3m PUR	2m PUR
BES0070	BES03RM	BES00A0	BES009Y	BES00F3
BES006W	BES03RL	BES009M	BES009L	BES03TC
BES006R		BES009C	BES0099	BES00F0
BES006M		BES0096	BES0095	BES03TE
				BES00A3

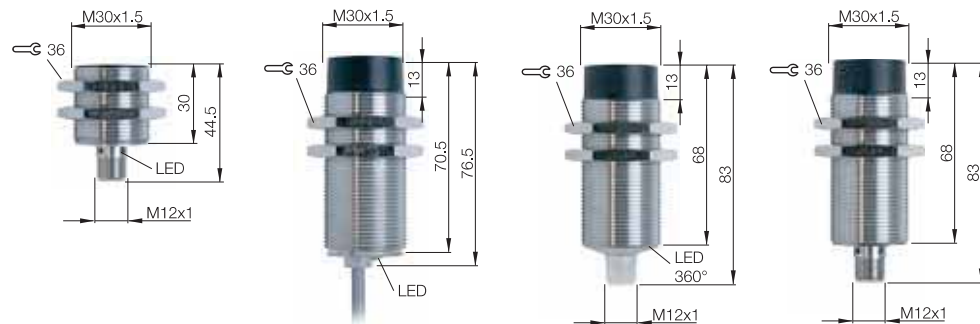
Refer to Balluff website for latest technical information.

Balluff Global – Inductive

DC 3-wire – M30



Housing size	M30x1.5	M30x1.5	M30x1.5			
Mounting	Flush	Flush	Flush			
Rated operating distance Sn	10 mm	10 mm	15 mm			
Assured operating distance Sa	0...8.1 mm	0...8.1 mm	0...12.2 mm			
Cable length and material				2m PVC	2m PUR	3m PUR
PNP Normally open	BES00A4	BES00F8	BES00AA			BES00A6
PNP Normally closed	BES009P	BES00F6	BES009T	BES009R		
NPN Normally open	BES009H	BES00F5	BES03RH			
NPN Normally closed	BES0097	BES03TA	BES03RJ			



Housing size	M30x1.5	M30x1.5	M30x1.5	M30x1.5
Mounting	Flush	Non-flush	Non-flush	Non-flush
Rated operating distance Sn	15 mm	30 mm	30 mm	30 mm
Assured operating distance Sa	0...12.0 mm	0...24.3 mm	0...24.3 mm	0...24.3 mm
Cable length and material		2m PVC	2m PUR	
PNP Normally open	BES00F9	BES00AY	BES00AW	BES00AZ
PNP Normally closed	BES00F7	BES00AT	BES00AR	BES00AU
NPN Normally open		BES00AN	BES00AM	BES00AP
NPN Normally closed		BES00AK	BES00AJ	BES00AL
				BES03RE
				BES03RC

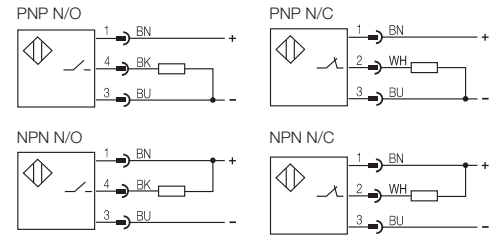
Balluff Global – Inductive

DC 3-wire – M30 and Wiring Diagrams



Wiring diagrams for 4-wire cordsets

(See page 31 for cordsets.)



Subject to change without notice. See Balluff website for latest technical specifications.

Correction factor

...gives the reduction in sensing distances for target materials which are not made of Fe 360 unless otherwise noted.

Material	Factor
steel	1.0
copper	0.25...0.45
brass	0.35...0.50
aluminum	0.30...0.45
stainless steel	0.60...1.00
nickel	0.65...0.75
cast iron	0.93...1.05

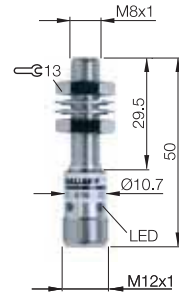
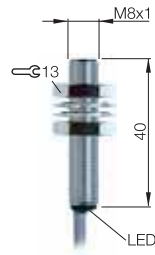
 Sensing Distance	 Sensing Distance	 Sensing Distance
M30x1.5	M30x1.5	M30x1.5
Flush	Flush	Flush
15 mm	15 mm	15 mm
0...12.0 mm	0...12.2 mm	0...12.2 mm
2m PUR		
BES00F4	BES00AF	BES00AH
BES00F2	BES03RK	BES009U
BES00F1		BES009J
BES03RF		BES0098



Refer to Balluff website for latest technical information.

Balluff Global – Inductive

DC 2-wire – M8, M18, and M30

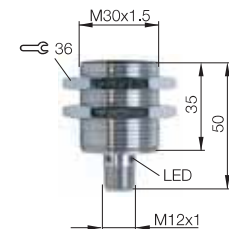
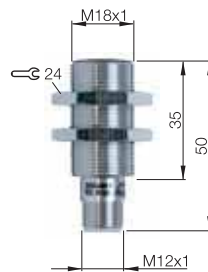


 Sensing Distance

 Sensing Distance

 Sensing Distance

Housing size	M8x1	M8x1	M8x1	
Mounting	Flush	Flush	Flush	
Rated operating distance Sn	2 mm	2 mm	2 mm	
Assured operating distance Sa	0...1.6 mm	0...1.6 mm	0...1.6 mm	
Cable length and material	2m PVC	2m PUR	.3m PUR	
Polarized	Normally open	BES001L	BES03HC	BES001Z
Polarized	Normally closed	BES024R	BES03H9	BES03H8
Non-polarized	Normally open	BES001T	BES03HJ	BES0022
Non-polarized	Normally closed	BES024T	BES03HE	BES024N
				BES001Y
				BES024P



 Sensing Distance

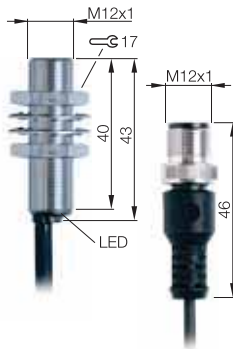
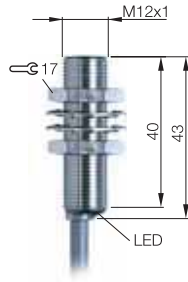
 Sensing Distance

 Sensing Distance

Housing size	M18x1	M18x1	M30x1.5	
Mounting	Flush	Flush	Flush	
Rated operating distance Sn	7 mm	7 mm	15 mm	
Assured operating distance Sa	0...5.7 mm	0...5.6 mm	0...12 mm	
Cable length and material				
Polarized	Normally open	BES0328	BES0069	BES008W
Polarized	Normally closed	BES02NL	BES02NM	BES027J
Non-polarized	Normally open	BES02NR	BES02NP	BES0094
Non-polarized	Normally closed	BES02NN	BES006A	BES027H

Balluff Global – Inductive

DC 2-wire – M12, M18, and M30



Sensing Distance

M12x1
Flush
3 mm
0...2.4 mm
2m PVC
3m PVC
BES0045
BES024L
BES024M

Sensing Distance

M12x1
Flush
3 mm
0...2.4 mm
.3m PUR
BES0042
BES03HK

Sensing Distance

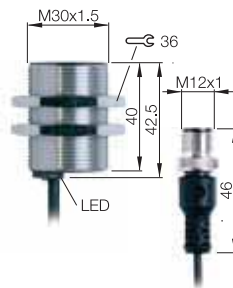
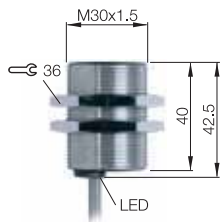
M12x1
Flush
3 mm
0...2.4 mm
BES003Z
BES024J
BES0041
BES024K

Sensing Distance

M18x1
Flush
7 mm
0...5.7 mm
2m PVC
2m PUR
BES00FA
BES02NT
BES0073
BES02NU

Sensing Distance

M18x1
Flush
7 mm
0...5.7 mm
.3m PUR
BES006C
BES039L



Sensing Distance

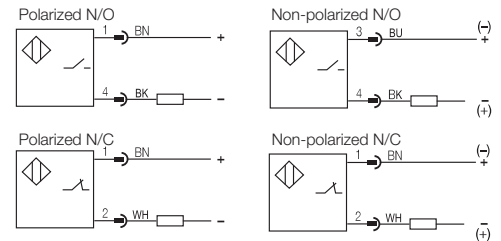
M30x1.5
Flush
15 mm
0...12.2 mm
2m PVC
2m PUR
BES008R
BES0279
BES0091
BES027A

Sensing Distance

M30x1.5
Flush
15 mm
0...12.2 mm
.3m PUR
BES03FW
BES008Y
BES03FY
BES03FZ
BES03H0

Wiring diagrams for 4-wire cordsets

(See page 31 for cordsets.)



Subject to change without notice. See Balluff website for latest technical specifications.

Correction factor

...gives the reduction in sensing distances for target materials which are not made of Fe 360 unless otherwise noted.

Material	Factor
steel	1.0
copper	0.25...0.45
brass	0.35...0.50
aluminum	0.30...0.45
stainless steel	0.60...1.00
nickel	0.65...0.75
cast iron	0.93...1.05

Refer to Balluff website for latest technical information.

Capacitive proximity sensors – object and level detection sensors that are competitively priced with above-average features

Balluff's economical line of capacitive sensors offers a broad range of products to reliably solve object and level detection applications. The family includes a wide array of tubular M12, M18 and M30 sensors available with either M12 connectors or pre-wired cables. Built to Balluff's high standards, all of the sensors offer reverse polarity and short circuit protection with enhanced EMC protection. Balluff's attention to quality, superior sensor design, and performance means better reliability, less down time, and higher productivity.

Features

- **Stainless steel or plastic (PBT) housings**
- **PNP and NPN versions with normally open or normally closed outputs**
- **Large Green power on LED**
- **Large Yellow output function LED**
- **High EMC noise immunity**

Standard Specifications

Rated supply voltage	24 V DC
Supply voltage range	10...30 V DC,
Max. load current	100 mA,
Short circuit protection	Yes
Polarity reversal protection	Yes
Switching frequency	100 Hz
Power indicator	Green LED
Output function indicator	Yellow LED
Degree of protection	IP67
Temperature range	-25° C...+70° C
Approvals	CE and CULus
Cable length and material	2m PUR

Object Detection

- **Flush switching characteristics**
- **Extended switching distances**
- **Recognition of plastic parts**



Flush-mount capacitive sensors employ a concentrated electrical field to detect objects up to 15mm away, regardless of color, texture or material.

Level Detection

- **Improved adhesion compensation through non-flush switching characteristic**
- **User adjustable sensitivity**



Non-flush mount versions of the sensor line are ideal for level detection of bulk material or liquids either directly or through a plastic or glass container wall. Non-flush sensors make use of a spherical electrical field that compensates for material adhesion with sensing distances up to 25mm.



Balluff Global – Capacitive M12

Object Detection



Housing size	M12x1	M12x1	M12x1	M12x1
Mounting	Flush	Flush	Flush	Flush
Rated switching distance Sn	1...4 mm	1...4 mm	1...4 mm	1...4 mm
Housing/Sensing face material	Stainless Steel/PBT	Stainless Steel/PBT	PBT/PBT	PBT/PBT
PNP Normally open	BCS00P0	BCS00R4	BCS00PJ	BCS00PU
PNP Normally closed	BCS00P1	BCS00P8	BCS00PK	BCS00PW
NPN Normally open	BCS00P2	BCS00P9	BCS00PL	BCS00PY
NPN Normally closed	BCS00P3	BCS00PA	BCS00PM	BCS00PZ

Level Detection

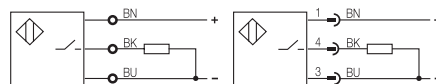


Housing size	M12x1	M12x1	M12x1	M12x1
Mounting	Non-flush	Non-flush	Non-flush	Non-flush
Rated switching distance Sn	1...8 mm	1...8 mm	1...8 mm	1...8 mm
Housing/Sensing face material	Stainless Steel/PBT	Stainless Steel/PBT	PBT/PBT	PBT/PBT
PNP Normally open	BCS00P4	BCS00PC	BCS00PN	BCS00R0
PNP Normally closed	BCS00P5	BCS00PE	BCS00PP	BCS00R1
NPN Normally open	BCS00P6	BCS00PF	BCS00PR	BCS00R2
NPN Normally closed	BCS00P7	BCS00PH	BCS00PT	BCS00R3

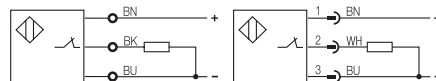
Wiring diagrams (See page 31 for cordsets.)

PNP (+) sourcing

Normally open

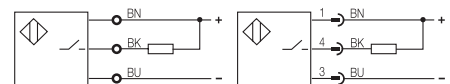


Normally closed

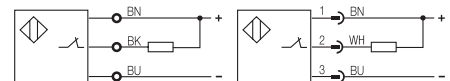


NPN (-) sinking

Normally open



Normally closed



Subject to change without notice. See Balluff website for latest technical specifications.

Refer to Balluff website for latest technical information.

Balluff Global – Capacitive

M18

Object
Detection



Housing size	M18x1	M18x1	M18x1	M18x1
Mounting	Flush	Flush	Flush	Flush
Rated switching distance Sn	2...8 mm	2...8 mm	2...8 mm	2...8 mm
Housing/Sensing face material	Stainless Steel/PBT	Stainless Steel/PBT	PBT/PBT	PBT/PBT
PNP Normally open	BCS00MF	BCS00LK	BCS00M8	BCS00NZ
PNP Normally closed	BCS00M4	BCS00LR	BCS00MH	BCS00M1
NPN Normally open	BCS00M5	BCS00LN	BCS00MJ	BCS00M2
NPN Normally closed	BCS00M6	BCS00LP	BCS00MK	BCS00M3

Level
Detection



Housing size	M18x1	M18x1	M18x1	M18x1
Mounting	Non-flush	Non-flush	Non-flush	Non-flush
Rated switching distance Sn	2...15 mm	2...15 mm	2...15 mm	2...15 mm
Housing/Sensing face material	Stainless Steel/PBT	Stainless Steel/PBT	PBT/PBT	PBT/PBT
PNP Normally open	BCS00ME	BCS00M7	BCS00LM	BCS00LL
PNP Normally closed	BCS00ML	BCS00M9	BCS00LT	BCS00LY
NPN Normally open	BCS00MM	BCS00MA	BCS00LU	BCS00LZ
NPN Normally closed	BCS00MN	BCS00MC	BCS00LW	BCS00M0

Balluff Global – Capacitive M30

Object Detection



Housing size	M30x1.5	M30x1.5	M30x1.5	M30x1.5
Mounting	Flush	Flush	Flush	Flush
Rated switching distance Sn	2...15 mm	2...15 mm	2...15 mm	2...15 mm
Housing/Sensing face material	Stainless Steel/PBT	Stainless Steel/PBT	PBT/PBT	PBT/PBT
PNP Normally open	BCS00MR	BCS00N2	BCS00NA	BCS00NM
PNP Normally closed	BCS00MT	BCS00N3	BCS00NC	BCS00NN
NPN Normally open	BCS00MU	BCS00N4	BCS00NE	BCS00NP
NPN Normally closed	BCS00MW	BCS00N5	BCS00NF	BCS00NR

Level Detection

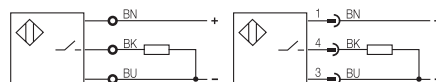


Housing size	M30x1.5	M30x1.5	M30x1.5	M30x1.5
Mounting	Non-flush	Non-flush	Non-flush	Non-flush
Rated switching distance Sn	1...25 mm	1...25 mm	1...25 mm	1...25 mm
Housing/Sensing face material	Stainless Steel/PBT	Stainless Steel/PBT	PBT/PBT	PBT/PBT
PNP Normally open	BCS00MY	BCS00N6	BCS00NH	BCS00NT
PNP Normally closed	BCS00MZ	BCS00N7	BCS00NJ	BCS00NU
NPN Normally open	BCS00N0	BCS00N8	BCS00NK	BCS00NW
NPN Normally closed	BCS00N1	BCS00N9	BCS00NL	BCS00NY

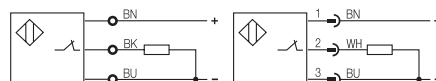
Wiring diagrams (See page 31 for cordsets.)

PNP (+) sourcing

Normally open

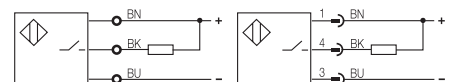


Normally closed

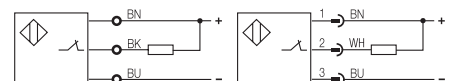


NPN (-) sinking

Normally open



Normally closed

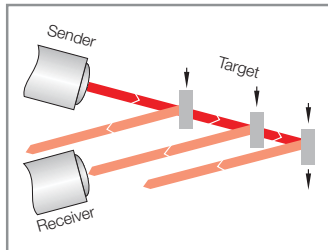


Subject to change without notice. See Balluff website for latest technical specifications.

Refer to Balluff website for latest technical information.

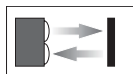
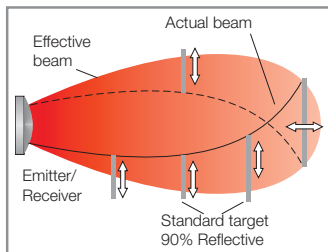
The best choice for everyday sensing needs

Simple to use, easy to install, economically priced – these characteristics describe this line of photoelectric sensors from Balluff. Featuring complete families of background suppression, diffuse, retroreflective, and thru-beam technologies, and several body styles to choose from, there is a solution waiting for your application. For standard specifications, refer to page 34.



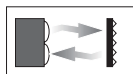
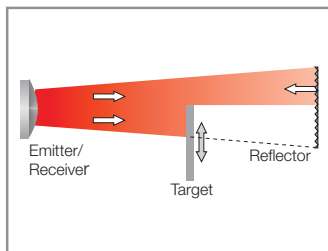
Background Suppression – page 19

An advanced sensing technology, Background Suppression sensors are able to sense targets and ignore objects behind them. This is made possible through either a mechanical or electronic adjustment on the receiving element that looks for the light reflected off of the target. These single-piece sensors feature an adjustable or fixed sensing range that lets you sense your target at a specific point within the sensor's range.



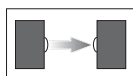
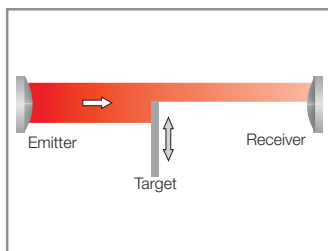
Diffuse – page 20

This standard sensing mode relies on the target to reflect light back to the receiver to turn on its output. Featuring a single piece design, these sensors are less expensive than Background Suppression sensors since they do not have the advanced technology necessary to ignore objects behind the desired target. Diffuse sensors also have an adjustment potentiometer or teach pushbutton that allows you to set the desired sensing range of the target.



Retroreflective – page 24

In Retroreflective sensing, a self-contained sensor with both an emitter and receiver emits light towards a reflector mounted within its rated sensing range. The output of the sensor is actuated when a target is passed into the effective beam of the sensor and it blocks the return of light to the receiver. The primary advantage of Retroreflective sensors over Diffuse or Background Suppression sensors is longer sensing range.



Thru-beam – page 26

The most reliable form of photoelectric sensing, Thru-beam sensors include a separate emitter and receiver that are aligned such that the maximum amount of light from the emitter hits the receiver. The output of the receiver is actuated when a target passes between the sensors and blocks the light to the receiver. Thru-beam sensors also feature the longest sensing range of these modes since all of the light from the emitter is directed at the receiver.

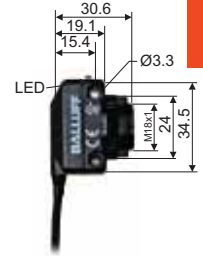
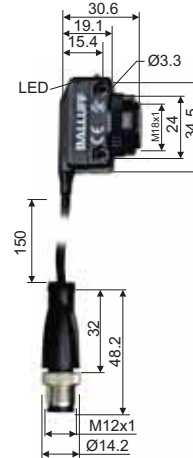
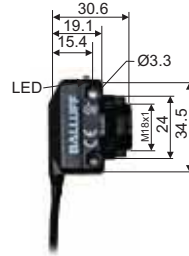
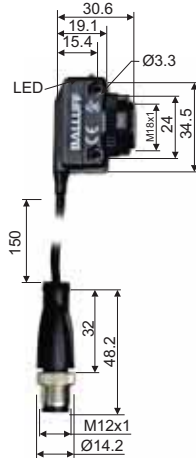
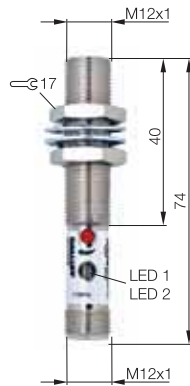
Body style		
Type		
Sensing range		
Light source		
Cable length and material		
PNP	NC/NO : Light-on/Dark-on	⑥
NPN	NC/NO : Light-on/Dark-on	⑦
PNP	NO/NC : Dark-on/Light-on	⑥
NPN	NO/NC : Dark-on/Light-on	⑦
PNP	NC/NO : Light-on/Dark-on	⑩

① = number indicates wiring diagram on page 34

Body style		
Type		
Sensing range		
Light source		
Cable length and material		
PNP	NO/NC : Light-on/Dark-on	⑥
NPN	NO/NC : Light-on/Dark-on	⑦
PNP	NO Light-on	①
NPN	NO Light-on	③
PNP	NC Dark-on	②
NPN	NC Dark-on	④

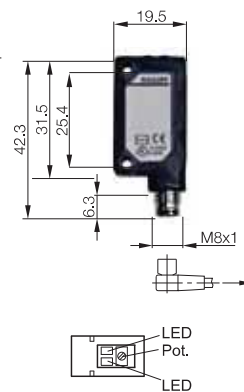
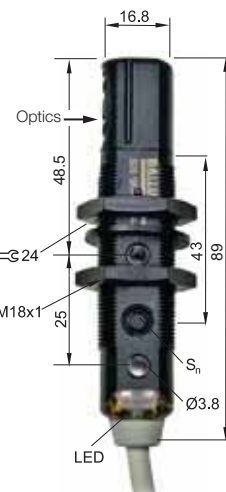
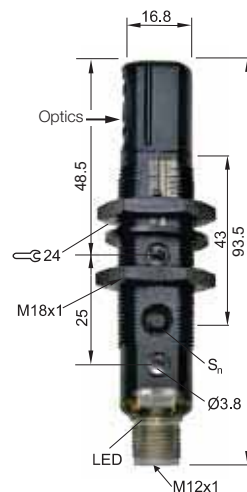
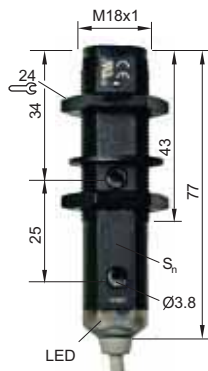
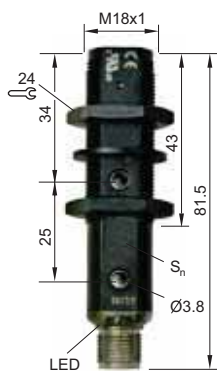
① = number indicates wiring diagram on page 34

Balluff Global – Photoelectric Background Suppression



12 mm threaded	Combination 18 mm threaded	Combination 18 mm threaded	Combination 18 mm threaded	Combination 18 mm threaded
Straight optics	90° optics	90° optics	90° optics	90° optics
60 mm	50 mm	50 mm	100 mm	100 mm
Visible red LED	Visible red	Visible red	Visible red	Visible red
	.15m PVC	2m PVC	.15m PVC	2m PVC
	BOS014R*	BOS014P*		BOS019A*
	BOS014U*	BOS014T*	BOS019C*	BOS019E*
				BOS019F*
BOS007T				

* Sensors cannot be adjusted, install sensors so that background cannot be detected.

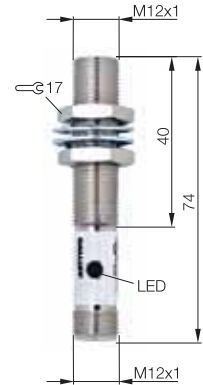
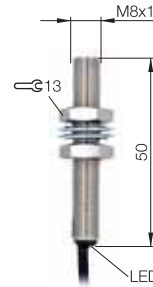


Combination 18 mm threaded	Combination 18 mm threaded	Combination 18 mm threaded	Combination 18 mm threaded	Small block	Small block
Straight optics	Straight optics	90° optics	90° optics	90° optics	90° optics
100 mm	100 mm	100 mm	100 mm	200 mm	200 mm
Visible red	Visible red	Visible red	Visible red	Visible red	Visible red
	2m PVC		2m PVC		2m PVC
BOS00JM	BOS00JL	BOS00LH	BOS00LF		
BOS00HR	BOS00HP	BOS00KY		BOS012A	BOS0129
				BOS011F	BOS011E
				BOS011Z	BOS011Y
				BOS0112	BOS0111

Refer to Balluff website for latest technical information.

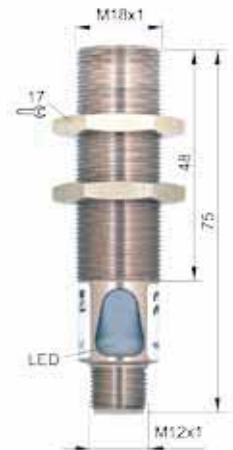
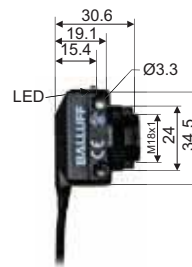
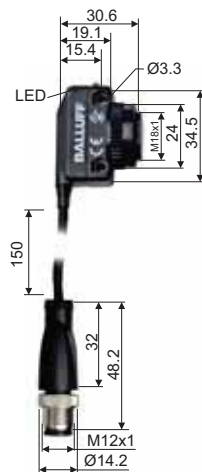
Balluff Global – Photoelectric

Diffuse Sensor 



Body style	8 mm threaded	8 mm threaded	12 mm threaded	
Type	Straight optics	Straight optics	Straight optics	
Sensing range	55 mm	55 mm	23 mm Fixed Focus	
Light source	Visible red	Visible red	Visible red	
Cable length and material		2m PUR		
PNP NO Light-on ①	BOS0006	BOS0005	BOS007R	
NPN NO Light-on ③	BOS0002	BOS014N		
PNP NC Dark-on ②	BOS0004	BOS0003		
PNP NC Dark-on ⑧				
NPN NC Dark-on ④		BOS014M		
NPN NC Dark-on ⑫	BOS0001			

① = number indicates wiring diagram on page 34



Body style	Combination 18 mm threaded	Combination 18 mm threaded	18 mm threaded	18 mm threaded	
Type	90° optics	90° optics	Straight optics	Straight optics	
Sensing range	450 mm	450 mm	400 mm	600 mm	
Light source	Infrared	Infrared	Visible red	Infrared	
Cable length and material	.15m PVC	2m PVC			
PNP NO Light-on ①			BOS01FA	BOS01HL	
PNP NC Dark-on ②			BOS01FC		
PNP NC/NO : Light-on/Dark-on ⑥	BOS012P	BOS012R			
NPN NC/NO : Light-on/Dark-on ⑦	BOS012F	BOS012H			

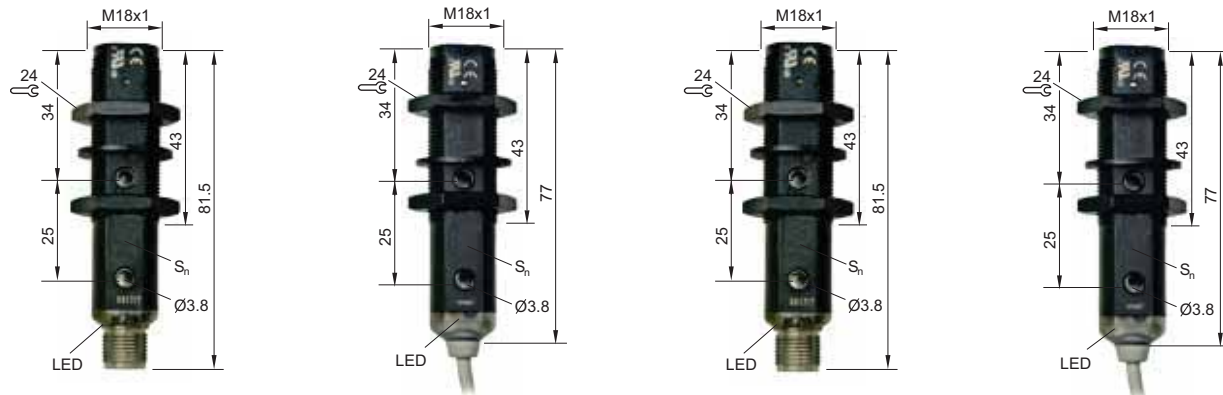
① = number indicates wiring diagram on page 34

Balluff Global - Photoelectric

Diffuse Sensor



12 mm threaded	12 mm threaded	12 mm threaded	12 mm threaded	12 mm threaded	12 mm threaded
Straight optics	Straight optics	Straight optics	Straight optics	Straight optics	Straight optics
100 mm	100 mm	200 mm	200 mm	400 mm	400 mm
Visible red	Visible red	Visible red	Visible red	Infrared	Infrared
	3m PVC		3m PVC		3m PVC
BOS0012	BOS0010	BOS0043	BOS0013	BOS0045	BOS000Y
BOS000H		BOS000K	BOS000J	BOS000E	BOS000C
BOS000P		BOS000T		BOS0044	
			BOS000R		BOS000L
BOS0042		BOS000A		BOS0007	

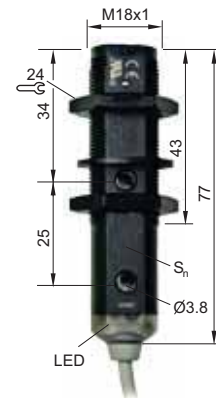
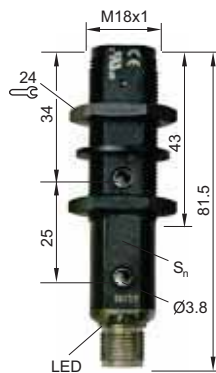


Combination 18 mm threaded	Combination 18 mm threaded	Combination 18 mm threaded	Combination 18 mm threaded
Straight optics	Straight optics	Straight optics	Straight optics
350 mm	350 mm	400 mm	400 mm
Class 1 red laser	Class 1 red laser	Infrared	Infrared
	2m PVC		2m PVC
BOS00JP	BOS00JN	BOS00JZ	BOS00JY
BOS00HU	BOS00HT	BOS00J3	BOS00J1

Refer to Balluff website for latest technical information.

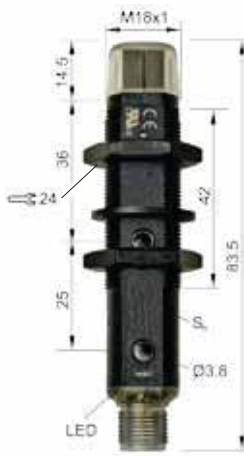
Balluff Global – Photoelectric

Diffuse Sensor 



Body style	Combination 18 mm threaded	Combination 18 mm threaded	
Type	Straight optics	Straight optics	
Sensing range	700 mm	700 mm	
Light source	Infrared	Infrared	
Cable length and material		2m PVC	
PNP NO/NC : Light-on/Dark-on ⑥	BOS00K1	BOS00K0	
NPN NO/NC : Light-on/Dark-on ⑦	BOS00J5	BOS00J4	

① = number indicates wiring diagram on page 34

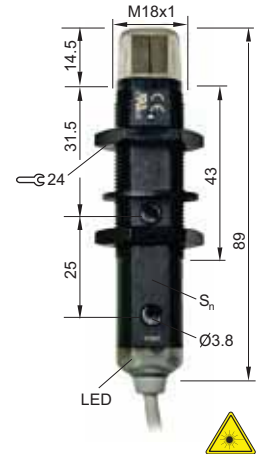
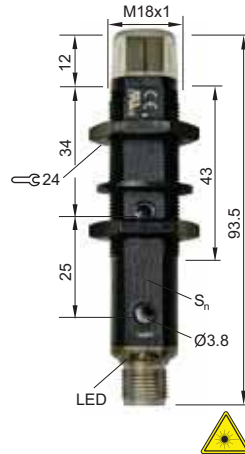
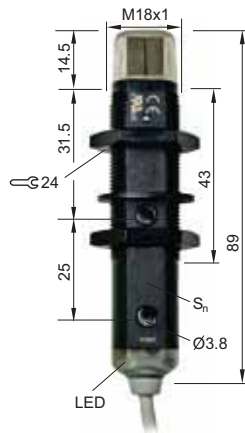
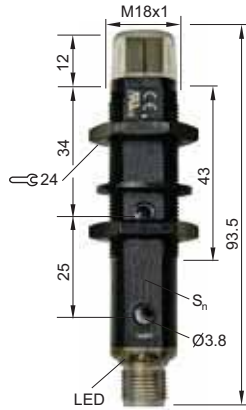


Body style	Combination 18 mm threaded	Combination 18 mm threaded	
Type	90° optics	90° optics	
Sensing range	80 mm	80 mm	
Light source	Infrared	Infrared	
Cable length and material		2m PVC	
PNP NO Light-on ①			
NPN NO Light-on ③			
PNP NC Dark-on ②			
PNP NC Dark-on ⑧			
NPN NC Dark-on ④			
PNP NO/NC : Light-on/Dark-on ⑥	BOS00M1	BOS00M0	
NPN NO/NC : Light-on/Dark-on ⑦	BOS00LE		

① = number indicates wiring diagram on page 34

Balluff Global – Photoelectric

Diffuse Sensor



Combination 18 mm
threaded
90° optics
400 mm
Infrared

BOS00LT
BOS00L6

Combination 18 mm
threaded
90° optics
400 mm
Infrared
2m PVC

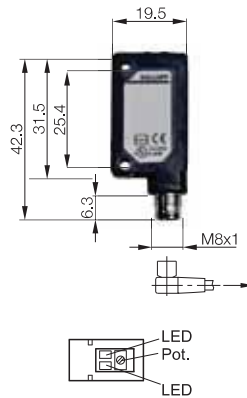
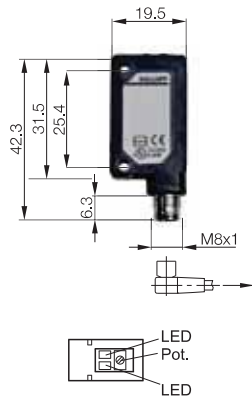
BOS00LR
BOS00L5

Combination 18 mm
threaded
90° optics
250 mm
Class 1 red laser

BOS00LK
BOS00L0

Combination 18 mm
threaded
90° optics
250 mm
Class 1 red laser
2m PVC

BOS00LJ
BOS00KZ



Small block
90° optics
200 mm
Visible red

BOS0128
BOS011C
BOS011W

BOS0110

Small block
90° optics
200 mm
Visible red
2m PVC

BOS0127
BOS011A

BOS011U
BOS010Z

Small block
90° optics
900 mm
Infrared

BOS0124
BOS0117

Small block
90° optics
900 mm
Infrared
2m PVC

BOS0123
BOS0116

BOS011K
BOS010P

Refer to Balluff website for latest technical information.

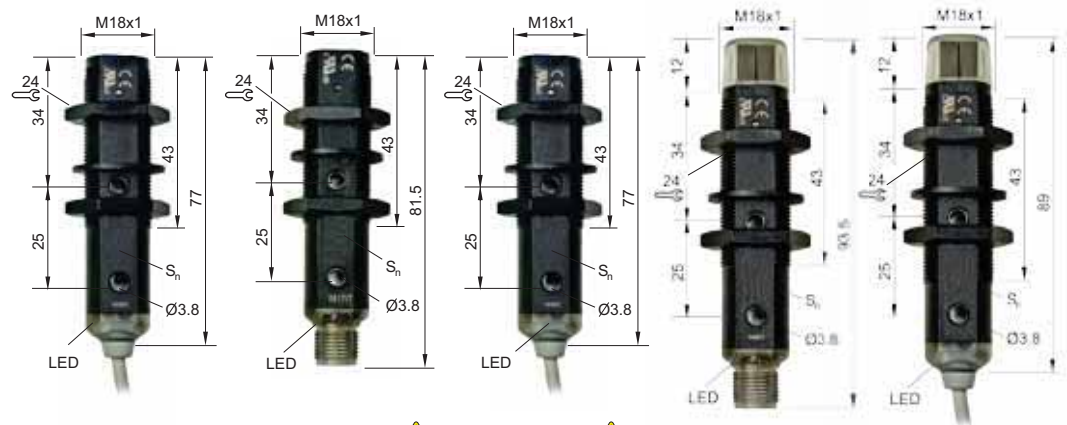
Balluff Global – Photoelectric

Retroreflective Sensor



Body style	8 mm threaded	8 mm threaded	12 mm threaded	12 mm threaded	18 mm threaded	
Type	Straight optics	Straight optics	Straight optics	Straight optics	Straight optics	
Sensing range	550 mm (polarized)	550 mm (polarized)	1.5 m (polarized)	1.5 m (polarized)	4 m (polarized)	
Light source	Visible red	Visible red	Visible red	Visible red	Visible red	
Cable length and material		2m PUR		3m PVC		
PNP NO/NC : Dark-on/Light-on ⑥						
NPN NO/NC : Dark-on/Light-on ⑦						
PNP NO Dark-on ①	BOS00RC	BOS00RA	BOS00RE	BOS00RK	BOS01F8	
NPN NO Dark-on ③	BOS00R7	BOS014Z	BOS00RF			
PNP NC Dark-on ②	BOS00R9		BOS00RJ		BOS01F9	
PNP NC Dark-on ⑧		BOS00R8		BOS00RH		
NPN NC Light-on ④	BOS00R6	BOS014Y				

① = number indicates wiring diagram on page 34

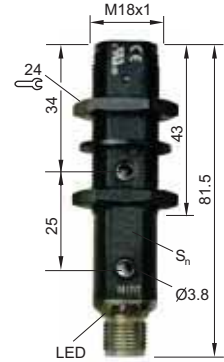
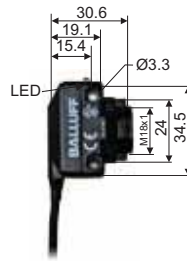
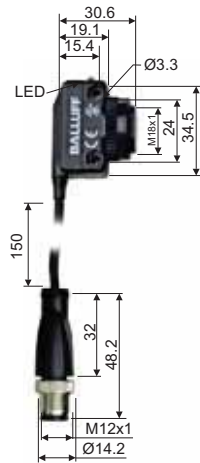
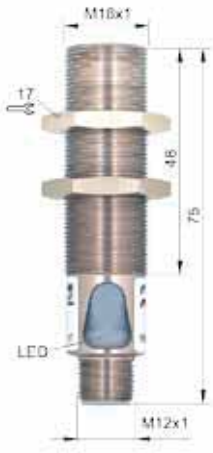


Body style	Combination 18 mm threaded	Combination 18 mm threaded	Combination 18 mm threaded	Combination 18 mm threaded	Combination 18 mm threaded	
Type	Straight optics	Straight optics	Straight optics	90° optics	90° optics	
Sensing range	4.5 m (polarized)	16 m (polarized)	16 m (polarized)	3 m (polarized)	3 m (polarized)	
Light source	Visible red	Class 1 red laser	Class 1 red laser	Visible red	Visible red	
Cable length and material	2m PVC		2m PVC		2m PVC	
PNP NO Dark-on ①						
NPN NO Dark-on ③						
PNP NC Light-on ②						
PNP NC Light-on ⑧						
NPN NC Light-on ④						
PNP NO/NC : Dark-on/Light-on ⑥	BOS00K2	BOS00JT	BOS00JR	BOS00LW	BOS00LU	
NPN NO/NC : Dark-on/Light-on ⑦	BOS00J6	BOS00HY	BOS00HW	BOS00L8	BOS00L7	

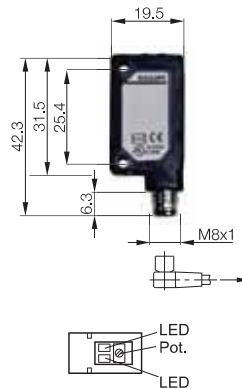
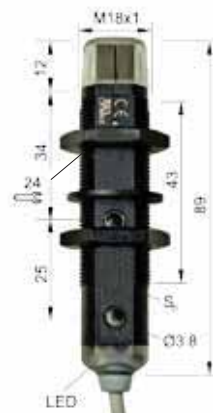
① = number indicates wiring diagram on page 34

Balluff Global – Photoelectric

Retroreflective Sensor

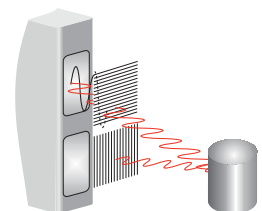


18 mm threaded	Combination 18 mm threaded	Combination 18 mm threaded	Combination 18 mm threaded	Combination 18 mm threaded	Combination 18 mm threaded
Straight optics	90° optics	90° optics	90° optics	90° optics	Straight optics
6 m	3.5 m (polarized)	3.5 m (polarized)	3.5 m (polarized)	6.5 m (polarized)	4.5 m (polarized)
Infrared	Visible red	Visible red	Visible red	Visible red	Visible red
	.15m PVC	2m PVC	2m PVC	2m PVC	
	BOS012W	BOS012Y	BOS012Z	BOS012K3	
	BOS012L	BOS012M	BOS012N	BOS00J7	
BOS01HK					



Polarized Retroreflective Sensors

In the illustration, light emitted by the sensor is filtered to take the vertical component out of the waveform. The light is then reflected off of a corner-cube reflector, which changes its orientation by 90 degrees. An additional filter is placed on the receiver lens to stop any light with the wrong orientation from getting through to the receiver, including ambient light or light reflecting from a shiny surface (like a mirror). This method of filtering allows Polarized Retroreflective sensors to see all kinds of targets.

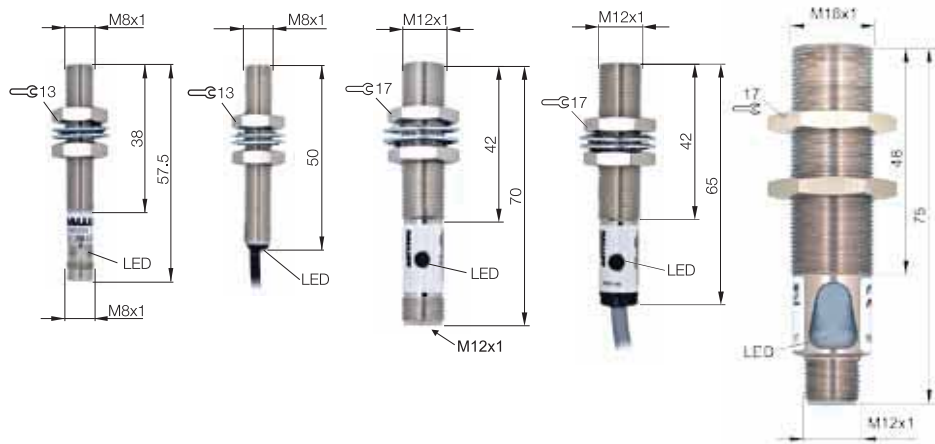


Combination 18 mm threaded	Combination 18 mm threaded	Small block	Small block
90° optics	90° optics	90° optics	90° optics
9 m (polarized)	9 m (polarized)	4 m (polarized)	4 m (polarized)
Class 1 red laser	Class 1 red laser	Visible red	Visible red
	2m PVC		2m PVC
		BOS012E	BOS012C
		BOS011J	BOS011H
		BOS0122	
			BOS0120
		BOS0115	BOS0113
BOS00LM	BOS00LL		
BOS00L2	BOS00L1		

Refer to Balluff website for latest technical information.

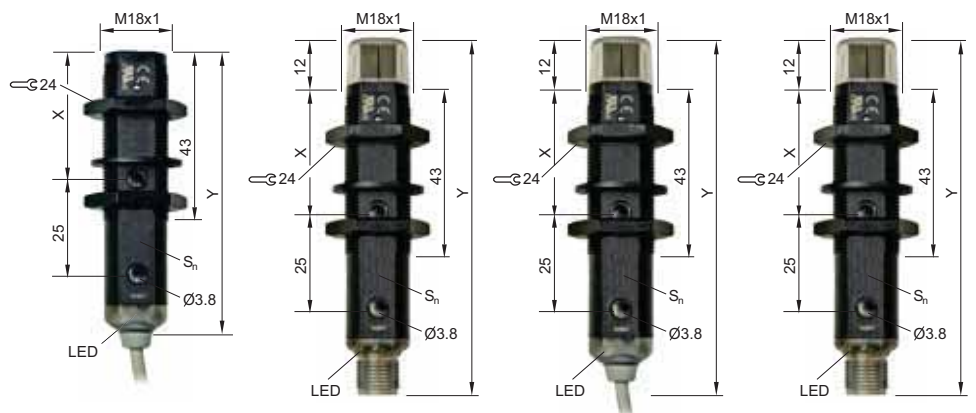
Balluff Global – Photoelectric

Thru-beam Sensor



Body style		8 mm threaded	8 mm threaded	12 mm threaded	12 mm threaded	18 mm threaded	
Type		Straight optics	Straight optics	Straight optics	Straight optics	Straight optics	
Sensing range		1.1 m	1.1 m	5 m	5 m	20 m	
Light source		Visible red	Visible red	Visible red	Visible red	Visible red	
Cable length and material			2m PUR		3m PVC		
Receiver	PNP NO Dark-on	① BOS00W9	BOS018F			BOS01FE	
Receiver	NPN NO Dark-on	③ BOS0154	BOS018C				
Receiver	PNP NC Light-on	② BOS0153				BOS01FF	
Receiver	PNP NC Light-on	⑧	BOS018E				
Receiver	NPN NC Light-on	④ BOS0152	BOS018A				
Receiver	PNP NO/NC : Dark-on/Light on	⑥		BOS00UE	BOS00UC		
Receiver	NPN NO/NC : Dark-on/Light on	⑦		BOS00UA			
Emitter		⑤ BOS0151	BOS018H	BOS00W2	BOS00UW	BOS01FH	
Emitter		⑨					

① = number indicates wiring diagram on page 34



Receiver: X = 34, Y = 77
Emitter: X = 24, Y = 67



Receiver: X = 34, Y = 93.5
Emitter: X = 24, Y = 83.5

Receiver: X = 34, Y = 89
Emitter: X = 24, Y = 79

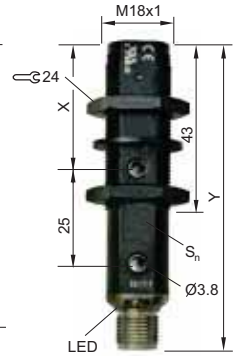
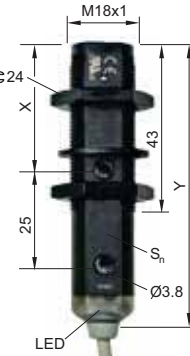
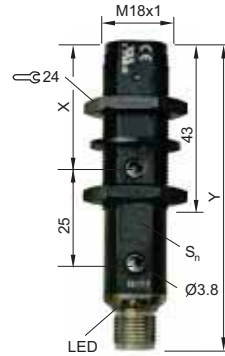
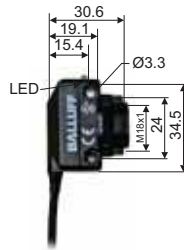
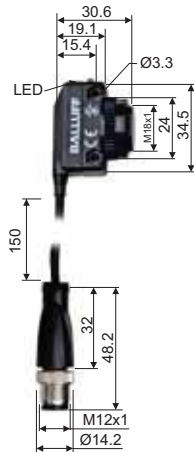
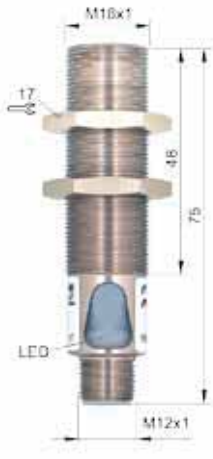
Receiver: X = 34, Y = 93.5
Emitter: X = 24, Y = 83.5



Body style		Combination 18 mm threaded	Combination 18 mm threaded	Combination 18 mm threaded	Combination 18 mm threaded	
Type		Straight optics	90° optics	90° optics	90° optics	
Sensing range		60 m	15 m	15 m	50 m	
Light source		Class 1 red laser	Infrared	Infrared	Class 1 red laser	
Cable length and material		2m PVC		2m PVC		
Receiver	PNP NO/NC : Dark-on/Light-on	⑥ BOS00CF	BOS00CW	BOS00CU	BOS00CT	
Receiver	NPN NO/NC : Dark-on/Light-on	⑦ BOS00C9	BOS00CP	BOS00CN	BOS00CM	
Emitter		⑨ BOS00EL	BOS00EW	BOS00EU	BOS00ET	

① = number indicates wiring diagram on page 34

Balluff Global – Photoelectric Thru-beam Sensor



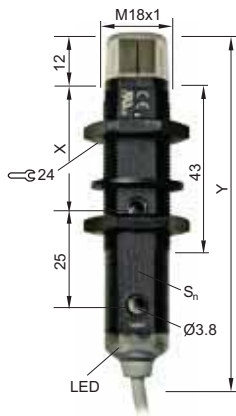
Receiver: X = 34, Y = 81.5
Emitter: X = 24, Y = 71.5

Receiver: X = 34, Y = 77
Emitter: X = 24, Y = 67

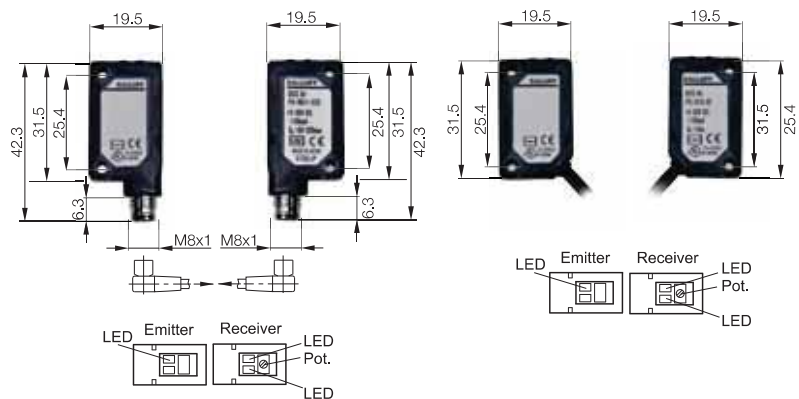
Receiver: X = 34, Y = 81.5
Emitter: X = 24, Y = 71.5



18 mm threaded	Combination 18 mm threaded	Combination 18 mm threaded	Combination 18 mm threaded	Combination 18 mm threaded	Combination 18 mm threaded	Combination 18 mm threaded
Straight optics	90° optics	90° optics	Straight optics	Straight optics	Straight optics	Straight optics
25 m	50 m	20 m	20 m	20 m	20 m	60 m
Infrared	Infrared	Infrared	Infrared	Infrared	Infrared	Class 1 red laser
	.15m PVC	2m PVC		2m PVC		
BOS01HP						
	BOS012T	BOS012U	BOS00CK	BOS00CJ	BOS00CH	
	BOS012J	BOS012K	BOS00CE	BOS00CC	BOS00CA	
BOS01HM	BOS0130	BOS0131				
			BOS00EP	BOS00EN	BOS00EM	



Receiver: X = 34, Y = 89
Emitter: X = 24, Y = 79



Combination 18 mm threaded	Small block	Small block
90° optics	90° optics	90° optics
50 m	10 m	10 m
Class 1 red laser	Infrared	Infrared
2m PVC		2m PVC
BOS00CL	PNP NO Dark-on (E-R set) ① ⑤ BOS0126*	BOS0125*
BOS00ER	NPN NO Dark-on (E-R set) ③ ⑤ BOS0119*	BOS0118*
	PNP NC Light-on (E-R set) ② ⑤ BOS011T*	
	PNP NC Light-on (E-R set) ⑧ ⑤	BOS011N*
	NPN NC Light-on (E-R set) ④ ⑤ BOS010Y*	
	NPN NC Light-on (E-R set) ⑧ ⑤	BOS010U*

*Emitter-Receiver set

Refer to Balluff website for latest technical information.

Balluff Global – Magnetic Field

204/214 C-slot, 235 T-slot

Sensors for pneumatic cylinders

Balluff's magnetic field cylinder sensors are based on non-contact, solid-state sensor technology that is compatible with both reed and Hall Effect magnetic pole orientations, making them the ideal replacement for standard magnetic switches. Electrically rugged, they feature short circuit protection, overload protection, and reverse polarity protection...all backed by Balluff's exclusive Lifetime Warranty. Improved sensor performance and better reliability results in less downtime and increased productivity. With Balluff's magnetic field sensors, you install and forget them.

Balluff's compact BMF sensors are designed to fit either C-slot or T-slot extrusions and require no additional brackets for mounting. These sensors fit flush into the slot, offering better sensor protection...nothing sticking out and nothing in the way. Flush mounting sensors make installation in space critical applications easier and less time consuming. In addition, cable clips are included for cleaner cable routing and better strain relief.

BMF Standard Specifications

Rated supply voltage	24 V DC
Supply voltage range	10...30 V DC,
Max. load current	100 mA,
Short circuit protection	Yes
Polarity reversal protection	Yes
Function indicator	Yes
Output function indicator	Yellow LED
Degree of protection	IP67
Temperature range	-25° C...+85° C
Approvals	CE and cULus
Cable material	PUR
Rated switching field	15 gauss
Assured switching field	25 gauss

BMF 204 and BMF 214 C-slot – Single Sensor

These magnetic field sensors are C-slot styles that are bracketless and provide rock-solid holding

Position detection with compact sensors for C-slots

BMF 204 – Designed for 3.8 mm slot

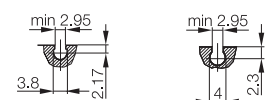
BMF 214 – Designed for 4 mm slot

- Slides into the C-slot from the end
- Superior holding strength
- Miniature design for short stroke cylinders and grippers
- Precise, accurate positioning



Series	BMF 204				BMF 214			
Cable length	.3 m	.3 m	.5 m	2 m	.3 m	.5 m	2 m	5 m
Connection type	M8 connector	M12 connector	M8 connector	PU cable	M8 connector	M8 connector	PU cable	PU cable
PNP No contact	BMF0002	BMF00A6	BMF0003	BMF0001	BMF00A2	BMF00A3	BMF00A1	BMF00E3

3.8 mm (BMF 204) 4 mm (BMF 214)



BMF 235 T-slot – Single Sensor

Position detection with compact sensors for T-slots

BMF 235 – The new standard for every T-slot

- Large, ultra-bright LED for easy diagnostics
- Installs from above into the T-slot – drop-in installation
- Installs with standard screwdriver or 1.5 mm Allen wrench
- Short, compact design with greater holding strength



Series	BMF 235				
Cable length	.3 m	.5 m	.3 m	.5 m	2 m
Dimensions (HxWxL)	5.5x5x23.5 mm	5.5x5x23.5 mm			5.5x5x23.5 mm
Connection type	M8 connector	M8 connector	M12 connector	M12 connector	PU cable
PNP NO	BMF00C4	BMF00CF	BMF00C5	BMF00CL	BMF00AR
PNP NC	BMF00C6				BMF00AT
NPN NO	BMF00C2				BMF00AU
NPN NC	BMF00C3				BMF00AW

Balluff Global – Magnetic Field

BMF - V-Twin

204/214 C-slot, 235 T-slot



V-Twin M8



V-Twin M12

Balluff's V-Twin® magnetic field sensors provide two sensors with a single connector in either an M8 or M12 configuration.

Substantial savings when using two sensors on one cylinder

- One, four-conductor cable versus two, three-conductor cables
- Less installation hardware
- Fewer wiring terminations
- Less installation time
- Lower initial costs compared to two separate sensors
- Double the number of sensors into a multiple interface block or sensor hub

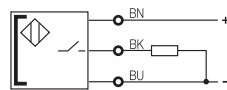
V-Twin

Series	204 C-slot		214 C-slot		235 T-slot	
Cable length	.3 m	.3 m	.3 m	.3 m	.3 m	.3 m
Connector	M8	M12	M8	M12	M8	M12
PNP	NO	NO	NO	NO	NO	NO
	BMF0006	BMF0005	BMF00A5	BMF00A4	BMF00CA	BMF00C9

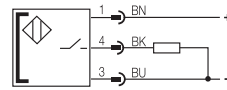
Wiring diagrams

NO

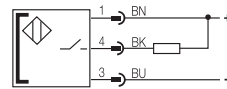
PNP/cable



PNP/connector

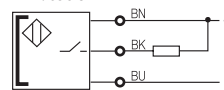


NPN/connector

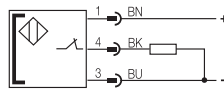


NC

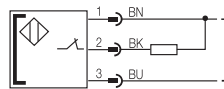
NPN/cable



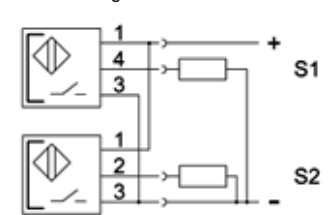
PNP/connector



NPN/connector



V-Twin Wiring



Subject to change without notice. See Balluff website for latest technical specifications.

Know your cylinder? Find your sensor.

Balluff's exclusive, easy-to-use online Pneumatic Cylinder Sensor Resource Center is designed to help you select the best solution for specific cylinder models.

The web-based interface will generate up to three sensor recommendations for each application. The Resource Center is designed to help you make a preliminary selection of products so you can download sensor datasheets and mounting bracket installation instructions.

The Resource Center will reduce your design time, aid you in component standardization, and ultimately provide you with a reference guide that will help reduce downtime when a replacement sensor is needed.

Pneumatic Cylinder Sensor Resource Center

Know your cylinder? Find your sensor.
Balluff's online Pneumatic Cylinder Sensor Resource Center is designed to help you select the best solution for specific cylinder models and will generate up to three recommendations. This selector is designed to help you make a preliminary selection of products. This tool will reduce your design time, aid you in product standardization, and ultimately provide you with a reference guide that will help reduce downtime.

Balluff Magnetic Field (BMF) sensors are based on robust, solid-state magneto-resistive technology. Available in metal or plastic housings, they have short circuit / overload / reverse polarity protection and come with an industry-leading LIFETIME warranty. Options include weld field immunity, application-specific brackets, and a variety of connection means including Balluff's exclusive V-Twin™ dual-sensor split connector system. The V-Twin will cut your hook up time and reduce your material costs by eliminating extra cordsets and Y-splitters when connecting to field I/O blocks.

Let us convince you that Balluff can be your #1 cylinder sensor supplier!

To access the BHF Center...
You need a BHF user name!

Don't have a BHF user name?
Signing up is easy.

[Sign up for BHF user name](#)

Already have a BHF user name?
Sign in here.

Email Address:

Password:

☐ Remember my ID and password?

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Visit:

www.balluff.us/bmfcenter

Refer to Balluff website for latest technical information.

DC – Power Supplies

For industrial automation power supply applications, the quality you expect from Balluff at a competitive price.

- 24 VDC output
- 0.75A to 40A output
- Single and three phase input
- DIN rail mount
- CE, UL, CUL, and TUV approvals
- Short circuit protected



Output Voltage	Output Current	Input Voltage	Housing	Class II Rating	Parallel Mode	Ready Output	Part Number	Order Code
Single-phase Input Power								
24 VDC	0.75 A	100...240 VAC	Plastic	Yes			BAE PS-XA-1W-24-007-001	BAE0001
24 VDC	1.25 A	100...240 VAC	Plastic	Yes		Yes	BAE PS-XA-1W-24-012-002	BAE0004
24 VDC	2.5 A	100...240 VAC	Plastic	Yes		Yes	BAE PS-XA-1W-24-025-002	BAE0005
24 VDC	3.8 A	115/230 VAC	Metal	Yes	Yes	Yes	BAE PS-XA-1W-24-038-003	BAE003J
24 VDC	5.0 A	115/230 VAC	Metal		Yes	Yes	BAE PS-XA-1W-24-050-003	BAE0006
24 VDC	10.0 A	115/230 VAC	Metal		Yes	Yes	BAE PS-XA-1W-24-100-004	BAE0002
24 VDC	20.0 A	115/230 VAC	Metal		Yes	Yes	BAE PS-XA-1W-24-200-005	BAE0003
Three-phase Input Power								
24 VDC	5.0 A	3x 340...575 VAC	Metal			Yes	BAE PS-XA-3Y-24-050-009	BAE0007
24 VDC	10.0 A	3x 340...575 VAC	Metal		Yes	Yes	BAE PS-XA-3Y-24-100-006	BAE0008
24 VDC	20.0 A	3x 340...575 VAC	Metal		Yes	Yes	BAE PS-XA-3Y-24-200-007	BAE0009
24 VDC	40.0 A	3x 340...575 VAC	Metal				BAE PS-XA-3Y-24-400-010	BAE003R

M8 Single-Ended

Type		M8 Female	M8 Female
Configuration		Straight	Right Angle
Voltage Rating		60 VAC/VDC (3wire), 30 VAC/VDC (4wire)	60 VAC/VDC (3wire) 30 VAC/VDC (4wire)
Amperage		4 A	4 A
3-wire	2m	BCC0CC0	BCC0CAY
	5m	BCC0AUM	BCC0AUP
	10m	BCC0AUN	BCC0AUR
4-wire	2m	BCC0CAZ	BCC0CAW
	5m	BCC0AUT	BCC0AUW
	10m	BCC0AUU	BCC0AUY



See our full line in the **Industrial Networking and Connectivity** catalog.

M12 Single-Ended

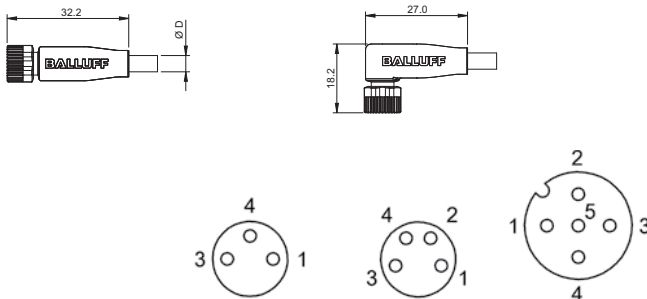
Type	M12 Female		M12 Female
Configuration	Straight		Right Angle
Voltage Rating	250 VAC/VDC		250 VAC/VDC
Amperage	4 A		4 A
4-wire	2m	BCC0CAU	BCC0CAT
	5m	BCC0AUZ	BCC0AW1
	10m	BCC0AW0	BCC0AW2

M8 and M12 Cable Specifications

Jacket Material	PVC	
Overmold material	Black TPU	
Cable jacket color	Yellow	
Conductor gauge	22AWG	
Temperature rating (moving)	-5...105°C	
Temperature rating (fixed)	-40...105°C	
Bending cycles	> 2 Million	
Number of conductors	3	4
Cable diameter	4.7 ± 0.15mm	5.0 ± 0.15mm

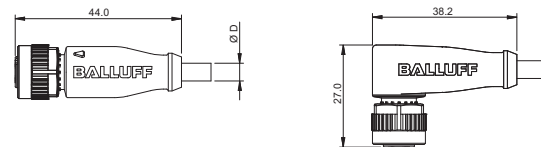
Technical data

M8 connectors – female straight and right-angle



Size	M8	M8	M12
Gender	Female	Female	Female
Poles	3-wire	4-wire	4-wire
Wire Code	DC	DC	DC
1	BR	BR	BR
2		WH	WH
3	BU	BU	BU
4	BK	BK	BK

M12 connectors – female straight and right-angle



3-Wire

Non-LED	Normally Open
Wiring code	001
1	_____
2	_____
3	_____
4	_____
5	_____

4-Wire

Non-LED	Normally Open/ Normally Closed
Wiring code	003
1	_____
2	_____
3	_____
4	_____
5	_____

Refer to Balluff website for latest technical information.

Balluff Global – Accessories

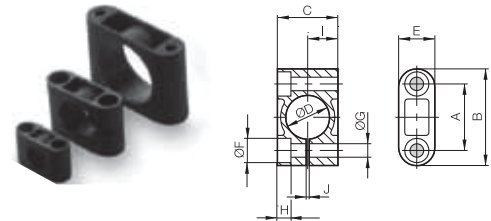
Inductive, capacitive, and photoelectric accessories

Clamping cuff

	A	B	C	ØD	E	F	G	H	I	J
BAM00A2	17	27	16	7.9	12	8	4.5	4.5	8	1
BAM00C4	22	32	20	11.9	12	8	4.5	4.5	10	1
BAM00F2	26	36	26	17.9	12	8	4.5	4.5	13	1
BAM00HN	42	55	38	30	18	10	5.5	5.5	19	1.5

Material: PA6

Note: All units are in mm

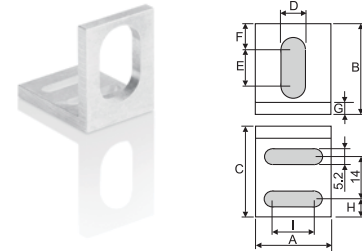


Slotted angle bracket (screws and washers included)

	A	B	C	D	E	F	G	H	I
BAM009U	25	30	30	8.1	12	7	4	6	14
BAM00C0	25	30	30	12.1	9	8.5	4	6	14
BAM00EY	30	40	40	18.1	11	12	5	10	18
BAM00HH	40	60	40	30.1	18	19	5	10	30

Material: Aluminum

Note: All units are in mm

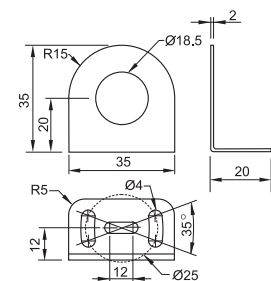
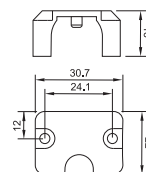
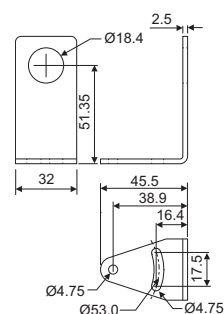


Photoelectric accessories

Type	Reflector Ø 84 mm	Reflector 51×62 mm	Small L bracket	Protective bracket
Mounting	One M5 screw	Two M4 screws	Two M3 screws	Two M3 screws
Ordering code	BAM00RH	BAM00WL	BAM00U5	BAM00U6
Material	PMMA	PMMA	Stainless steel	Stainless steel
Suitable product	All	All	BOS 5K	BOS 5K
Temperature range	0...+65 °C	0...+50 °C		
Reflectivity rating	85%	100 %		



Type	Small L bracket	Mounting adapter	Small L bracket
Mounting	Two M3 screws	Two M3 screws	Two M3 screws
Material	Stainless steel	Durethan	Aluminum
Suitable product	BOS 11K	BOS 18KF/KW	BOS 18KF/KW
Ordering code	BAM00PT	BAM00RW	BAM00RY

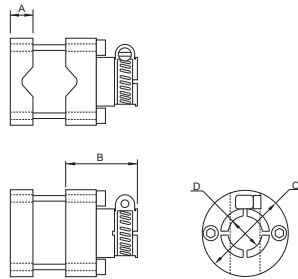


Capacitive accessories

Mounting Brackets

Fits	M12	M18	M30
Dimensions (mm)			
A	10.5	11.7	19.1
B	29.5	38.1	67.8
C	38.1	45.0	69.9
D	12.1	18.1	30.1
Tube diameter (mm)	9.4-20.6	9.4-20.6	25.4-44.5
Ordering code	BAM015E	BAM015F	BAM015H

Material: Plastic and Stainless Steel



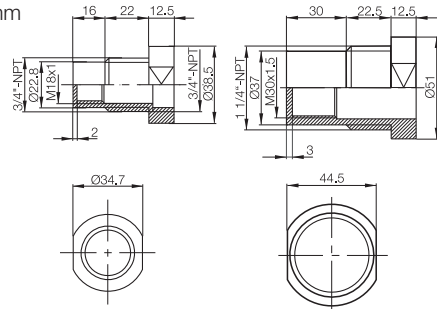
Accessories Deliver Faster Changeover Time

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.

Cover Nut

Fits	M18x1	M30x1.5
Ordering code	BAM00F1	BAM00H2

Note: All units are in mm



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

Please note. The nominal switching distance of capacitive switches is reduced by 2 mm when the cover nut is installed.

BMF accessories

Tie rod and round body cylinders – T-slot sensors with “stay put brackets” offer solutions for tie rod and round body cylinders.

BMF 235 – round body

T-slot bracket with tube cuff

Part number	Cylinder diameter (mm)
SET010H	7-11
SET010J	11-19
SET010K	18-29
SET010L	28-39
SET010M	38-49
SET010N	48-59
SET010P	58-69
SET010T	68-79
SET010R	78-89



Tie rod brackets for BMF 235



Part number	Cylinder profile
BAM01M9	Profile cylinder and tie bar up to 5...11 mm
BAM01MA	Profile cylinder and tie bar up to 9...15 mm
BAM01MC	Profile cylinder and tie bar 14...20 mm

Refer to Balluff website for latest technical information.

Balluff Global – Photoelectric

Specifications and Wiring Diagrams

Photoelectric Standard Specifications

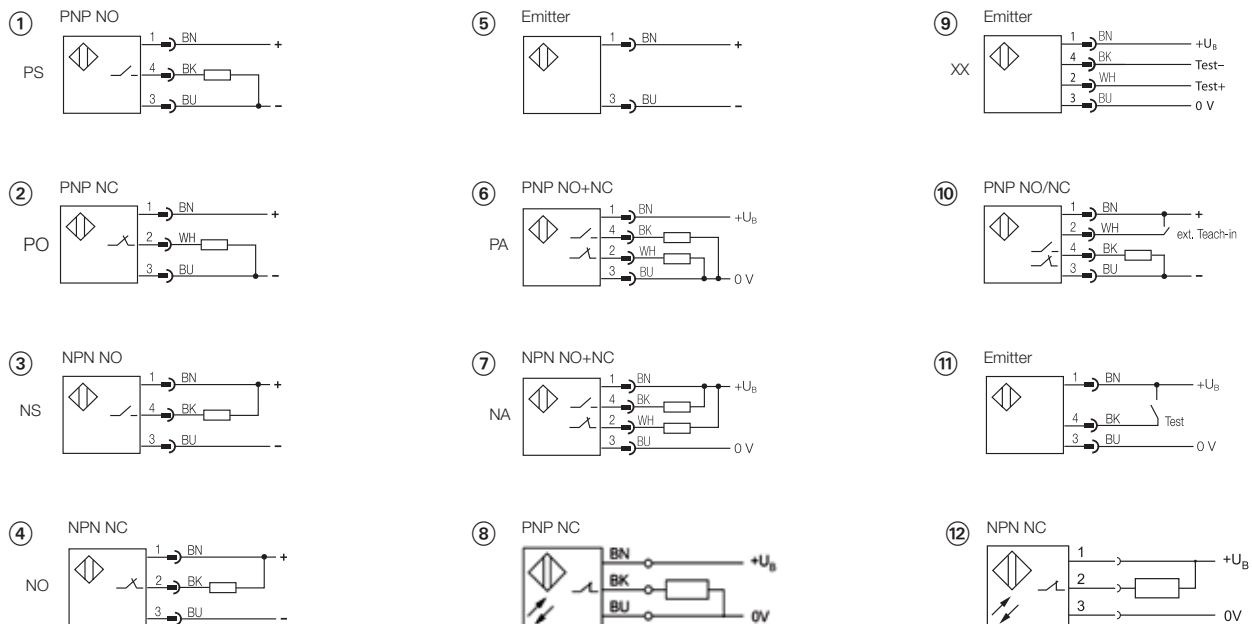
	BOS 5K	BOS 08M	BOS 11K	BOS 12M	BOS 18KF/KW	BOS 18M
Form Factor	Small block	8 mm threaded	Combination 18 mm threaded	12 mm threaded	Combination 18 mm threaded	18 mm threaded
Optics orientation	90°	Straight	90°	Straight	Straight (18KF), 90° (18KW)	Straight
Supply voltage	10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc	10...30 Vdc
Max. load current	100 mA	100 mA	100 mA	100 mA* 200 mA	100 mA	100 mA
Short circuit protection	Yes	Yes	Yes	Yes	Yes	Yes
Current overload protection	Yes	Yes	Yes	Yes	Yes	Yes
Polarity reversal protection	Yes	Yes	Yes	Yes	Yes	Yes
Degree of protection	IP67	IP67	IP67	IP67	IP67	IP67
Temperature range	-25 to +55° C	-10 to +60° C	-20 to +55° C	-20 to +60° C* -10 to +60° C	-25 to +55° C	-5 to +55° C
Approvals	CE	CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
Connection	M8 4-pin or 2 m cable	M8 3-pin or cable	M12 4-pin pigtail or 2 m cable	M12 4-pin or cable	M12 4-pin or 2 m cable	M12

Consult Balluff website for latest technical specifications.

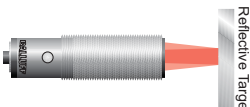
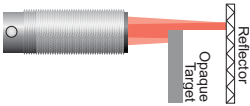
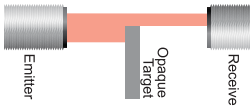
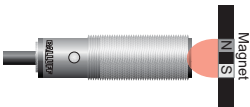
*Background suppression fixed focus.

Wiring Diagrams

Subject to change without notice. See Balluff website for latest technical specifications.



Sensor Technology Guide

	Description	Sensing Range (typ.)	Advantages	Disadvantages	Applications
Inductive 	Detects various metal targets using magnetic field	0 - 30 mm	Popular, very rugged, best in harsh environments, economical, simple use	Short range, detects only metal targets	General purpose, welding, metal cutting, RPM pickup
Photoelectric: Diffuse 	Detects any target capable of reflecting light	0 - 900 mm	Popular, good for small targets, handles many applications	Short range, affected by dirt, color dependent	General purpose, color mark, label detection
Photoelectric: Retroreflective 	Detects any target capable of blocking light	0 - 16 m	Best for conveyors or transparent targets, medium sensing range	Requires a reflector, affected by dirt build-up	Conveyors, large openings, bottle detection
Photoelectric: Thru-Beam 	Detects target capable of blocking light	0 - 60 m	Best for long range or to look through a translucent object, tolerant of dirt	Requires both an emitter and a receiver	Height verification, loop control, fill level
Capacitive: Object Detection 	Detects target based on change in density	0 - 25 mm	Best for detecting dense materials; adjustable, simple	Short range, affected by humidity changes	Detects objects regardless of color, texture, or material
Capacitive: Level Detection 	Detects target based on change in density	0 - 25 mm	Best for detecting bulk material or liquids directly or through plastic or glass container wall	Can be affected by material buildup	Detects objects regardless of color, texture, or material
Magnetic 	Detects a magnet	Magnet dependent	Best for pneumatic cylinders, detects through most objects (except steel)	Short range, requires magnet	Cylinder position detection



Object Detection

Inductive sensors, cylinder sensors, magnetic field sensors, capacitive sensors, ultrasonic sensors, photoelectric sensors, fiber optic devices, fiber optics, angle sensors, through-beam fork sensors, optical window sensors, light grids, contrast sensors, luminescence sensors, color sensors, mechanical and inductive single and multiple position switches



Linear Position and Measurement

Micropulse® transducers, magnetic linear encoder system, inductive displacement system, inductive distance sensors, magnetoinductive distance sensors, capacitive distance sensors, photoelectric distance sensors, ultrasonic sensors



Fluid Detection

Pressure sensors, capacitive sensors for level detection



Industrial Identification

Industrial RFID systems, vision sensors



Networking and Connectivity

Connectors and connection cables, valve connectors, passive splitter boxes, active splitter boxes, IO-Link, bus systems (Profibus, Profinet, CC-Link, DeviceNet, EtherNet), inductive couplers, power supplies, electrical devices



Accessories

Brackets and mountings, assembly system BMS

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