

When there's no space for a photoelectric sensor, there is only one solution: user fiber optics!

If there are no particular demands for toughness and chemical resistance, then plastic fiber optics are the right choice.

A wide range of special base units with various performance and function features is available when using the fiber optics. From the simple version with potentiometer to the high-end unit with display.

**Applications**

- Small parts detection
- Suitable for tight mounting conditions
- Inspecting parts features
- Counting (e.g. counting drops)
- Precise parts positioning
- Assembly and handling
- Robotics

**BFB 75K...**



**BOS 6K...**



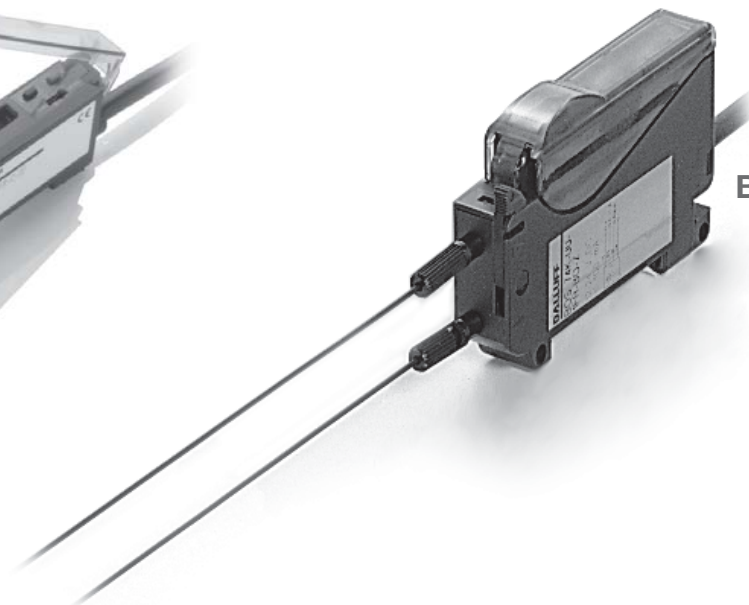
**BOS 18KF...**

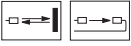


**BOS 73K...**



**BOS 74K...**



Type	Light type	Output				Output function		Switching frequency	U <sub>B</sub>		Connection			Special features		Page
		PNP-Transistor	NPN-Transistor	Analog output	Alarm output	Light-on	Dark-on		10...30 V DC	11...26 V DC	M8 connector, 3-pin	M8 connector, 4-pin	M12 connector, 4-pin	Cable	Teach-in	
 <b>Fiber optic base units</b>																
BFB 75K-001-P-S75	■	■				■	■	1.5 kHz	■			■			■	<b>2.2.5</b>
BFB 75K-001-N-S75	■		■			■	■	1.5 kHz	■			■			■	<b>2.2.5</b>
BFB 75K-001-P-02	■	■				■	■	1.5 kHz	■				■	■		<b>2.2.5</b>
BFB 75K-001-N-02	■		■			■	■	1.5 kHz	■				■	■		<b>2.2.5</b>
BFB 75K-002-P-S75	■	■				■	■	8 kHz	■			■			■	<b>2.2.7</b>
BFB 75K-002-N-S75	■		■			■	■	8 kHz	■			■			■	<b>2.2.7</b>
BFB 75K-003-P-02	■	■		■		■	■	8 kHz	■				■	■	■	<b>2.2.7</b>
BFB 75K-003-N-02	■		■	■		■	■	8 kHz	■				■	■	■	<b>2.2.7</b>
BOS 73K-PU-1FR-C-02	■		■		■	■	■	1 kHz		■		■			■	<b>2.2.9</b>
BOS 73K-PU-1FR-C-S75-00,1	■		■		■	■	■	1 kHz		■				■	■	<b>2.2.9</b>
BOS 74K-UU-1FR-B0-Z-S49-00,2	■	■	■			■	■	1 kHz	■		■					<b>2.2.11</b>
BOS 74K-UU-1FR-B0-Z-02	■	■	■		■	■	■	1 kHz	■				■			<b>2.2.11</b>
BOS 74K-UU-1FS-B0-Z-02	■	■	■		■	■	■	8 kHz	■				■			<b>2.2.11</b>
BOS 6K-PU-1FR-S75-C	■	■				■	■	1 kHz	■			■			■	<b>2.2.13</b>
BOS 6K-PU-1FR-C-02	■	■				■	■	1 kHz	■				■	■		<b>2.2.13</b>
BOS 6K-NU-1FR-S75-C	■		■			■	■	1 kHz	■			■			■	<b>2.2.13</b>
BOS 6K-NU-1FR-C-02	■		■			■	■	1 kHz	■				■	■		<b>2.2.13</b>
BOS 18KF-PA-1FR-S4-C	■	■				■	■	1 kHz	■			■				<b>2.2.15</b>
BOS 18KF-PA-1FR-C-02	■	■				■	■	1 kHz	■				■			<b>2.2.15</b>
BOS 18KF-NA-1FR-S4-C	■		■			■	■	1 kHz	■			■				<b>2.2.15</b>
BOS 18KF-NA-1FR-C-02	■		■			■	■	1 kHz	■				■			<b>2.2.15</b>

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Connectors ... page 5.2 ...

The **BFB 75K-001...** is considered the basic model of the new series of fiber optic base units **BFB 75K** for DIN rail mount. As an economical sensor it is ideally suited for standard applications. Ease of setting using a teach-in procedure on the sensor or via an external teach line make the sensor especially user-friendly.

**Features**

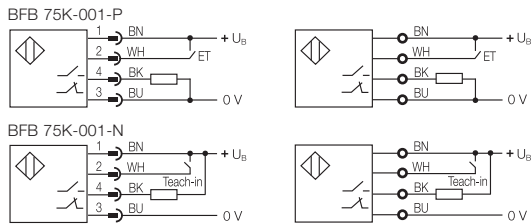
- Red light
- Teach-in
- Connector and cable versions



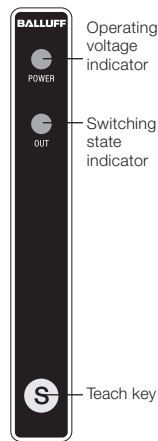
**Mounting notes for fiber optics**

The resistance of the sealing ring must be overcome when connecting the fiber optics to the base unit.

**Wiring diagrams**



**Control panel**

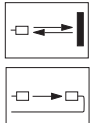
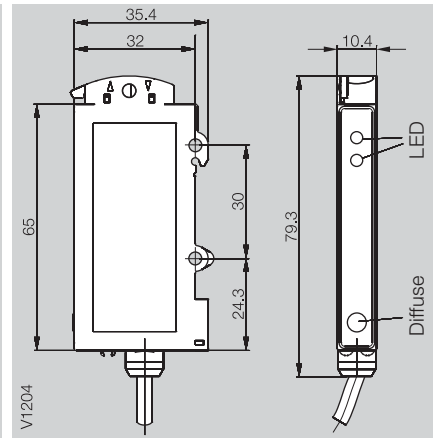
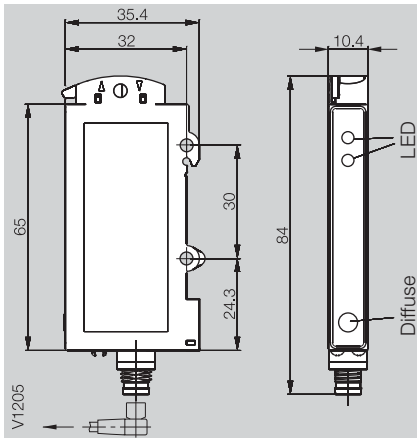


**Recommended accessories**  
please order separately



Connector  
BKS-S 74/BKS-S 75

Series	BFB 75K	BFB 75K
Plastic fiber optic base unit	for plastic fiber optics with outside diameter 2.2 mm	for plastic fiber optics with outside diameter 2.2 mm
Sensing distance/range	depends on fiber optic cable	depends on fiber optics



### Base unit

PNP	BFB 75K-001-P-S75	BFB 75K-001-P-02
NPN	BFB 75K-001-N-S75	BFB 75K-001-N-02
<b>Electrical data</b>		
Supply voltage $U_B$	10...30 V DC	10...30 V DC
Ripple	$\leq 10\%$	$\leq 10\%$
No-load supply current $I_0$ max.	$\leq 20$ mA	$\leq 20$ mA
Switching output	PNP- or NPN-Transistor	PNP- or NPN-Transistor
Switching type	Light-/dark-on (selectable)	Light-/dark-on (selectable)
Output current	100 mA	100 mA
Voltage drop $U_d$ at $I_0$	$\leq 1.5$ V	$\leq 1.5$ V
Settings	Teach-in	Teach-in
<b>Optical data</b>		
Emitter, light type	LED, red light	LED, red light
Wavelength	660 nm	660 nm
Light spot diameter	depends on fiber optics	depends on fiber optics
<b>Time data</b>		
Response time		
Switching frequency $f$	1.5 kHz	1.5 kHz
<b>Indicators</b>		
Power-on indicator	LED green	LED green
Switching state indicator	LED yellow	LED yellow
<b>Mechanical data</b>		
Connection	M8 connector, 4-pin	2 m cable, PVC
No. of wires $\times$ cross-section		4 $\times$ 0.14 mm <sup>2</sup>
Housing material	ABS	ABS
Optical surface	depends on fiber optic cable	depends on fiber optic cable
Weight	20 g	50 g
<b>Ambient data</b>		
Degree of protection per IEC 60529	IP 64	IP 64
Polarity reversal protected	yes	yes
Short circuit protected	yes	yes
Ambient temperature range $T_a$	-20...+60 °C	-20...+60 °C



Connector orientation

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The BFB **75K-002...** offers perfect performance as a high-end amplifier with 12-bit resolution, a 4-digit display and a switching frequency of up to 8 kHz. Various operating modes such as Fine or High Distance allows the sensor to be better adapted to the respective application. Configurable time functions, window programming and fine adjustment of a switching point round out the sensor.

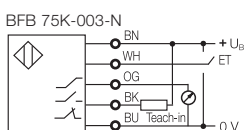
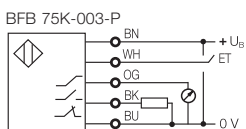
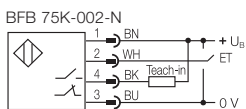
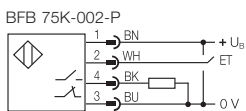
An additional analogue output makes the **BFB 75K-003...** version a great all-rounder. It provides an output signal proportional to remission or to the distance from the target. All functions of the BFB 75K-02 are also included.



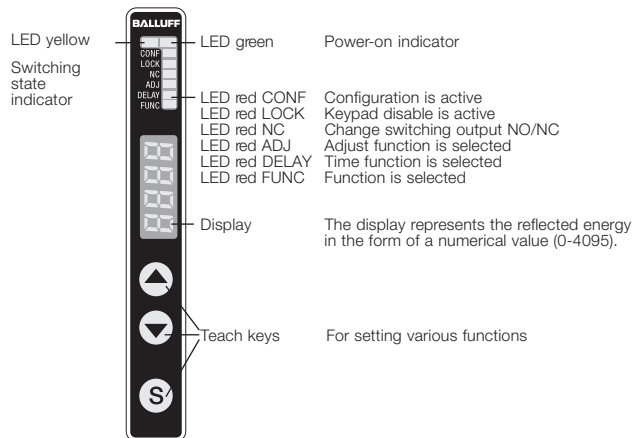
Operating mode	Standard	High Resolution	High switching frequency	Long range
Sensing distance*	150 mm	70 mm	70 mm	300 mm
Switching frequency	1 kHz	125 Hz	8 kHz	125 Hz

\*depending on fiber optics used

**Wiring diagrams**



**Control panel**

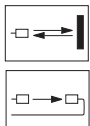
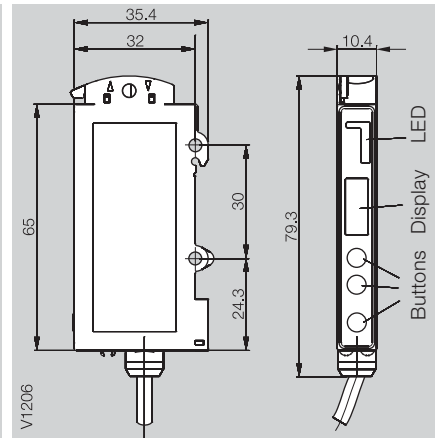
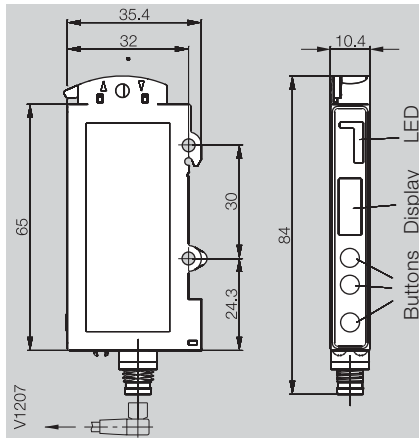


**Recommended accessories**  
please order separately



Connector  
BKS-S 74/BKS-S 75

Series	BFB 75K	BFB 75K
Plastic fiber optic base unit	for plastic fiber optics with outside diameter 2.2 mm	for plastic fiber optics with outside diameter 2.2 mm
Sensing distance/range	depends on fiber optics	depends on fiber optics



### Base unit

PNP	BFB 75K-002-P-S75	BFB 75K-003-P-02
NPN	BFB 75K-002-N-S75	BFB 75K-003-N-02
<b>Electrical data</b>		
Supply voltage $U_B$	10...30 V DC	10...30 V DC
Ripple	$\leq 10\%$	$\leq 10\%$
No-load supply current $I_0$ max.	$\leq 25$ mA	$\leq 25$ mA
Analog output		<b>0...10 V (max. 2 mA)</b>
Switching output	PNP- or NPN-Transistor	PNP- or NPN-Transistor
Switching type	Light-/dark-on (selectable)	Light-/dark-on (selectable)
Output current	100 mA	100 mA
Voltage drop $U_d$ at $I_0$	$\leq 2$ V	$\leq 2$ V
Settings	Teach-in	Teach-in
<b>Optical data</b>		
Emitter, light type	LED, red light	LED, red light
Wavelength	630 nm	630 nm
Light spot diameter	depends on fiber optics	depends on fiber optics
<b>Time data</b>		
Switching frequency $f$	Standard Fast Mode	Standard Fast Mode
	1 kHz 8 kHz	1 kHz 8 kHz
Time function	On- and/or off-delay 1...2000 ms adjustable	On- and/or off-delay 1...2000 ms adjustable
<b>Indicators</b>		
Power-on indicator	LED green	LED green
Switching state indicator	LED yellow	LED yellow
Status indicator	6x LED red	6x LED red
Display	4-digit	4-digit
<b>Mechanical data</b>		
Connection	M8 connector, 4-pin	2 m cable, PVC
No. of wires x cross-section		5x0.14 mm <sup>2</sup>
Housing material	ABS	ABS
Optical surface	depends on fiber optic cable	depends on fiber optic cable
Weight	20 g	50 g
<b>Ambient data</b>		
Degree of protection per IEC 60529	IP 64	IP 64
Polarity reversal protected	yes	yes
Short circuit protected	yes	yes
Ambient temperature range $T_a$	-20...+60 °C	-20...+60 °C

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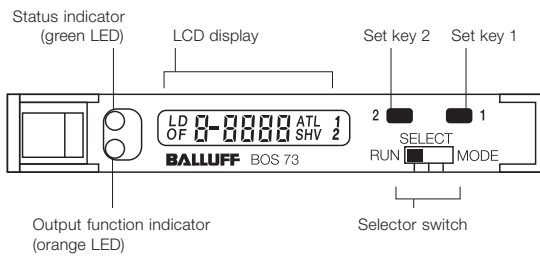
The **BOS 73K** with indicators simplifies operation of the sensor and gives an accurate overview of the settings. The display shows sensitivity, signal strength as well as ancillary functions. The switching point and hysteresis can be automatically acquired but also manually set. The powerful red light emitter permits very long sensing distances and ranges. A switching and alarm output is also provided, and time functions can also be set. Two transmission channels are provided for using multiple sensors without mutual interference.

**Features**

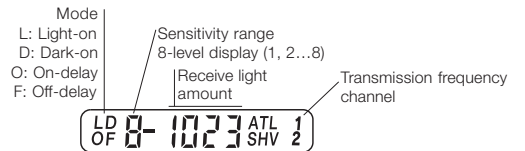
- LCD display with backlighting
- Teach-in calibration
- Powerful red light emitter for long ranges
- Contamination output
- All time functions can be set from 10...120 ms
- Two transmission channels



**Control panel**

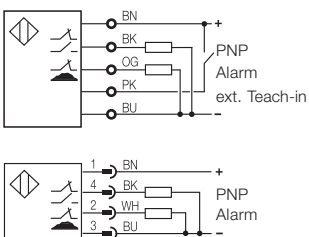


**Display**



Functions	
Sensor functions	Ancillary functions
A: Autodetect	S: Manual sensitivity setting/turn-on point
T: Teach	H: Manual hysteresis setting (turn-off point)
L: Lock	V: Display signal strength fluctuation and absolute value

**Wiring diagrams**



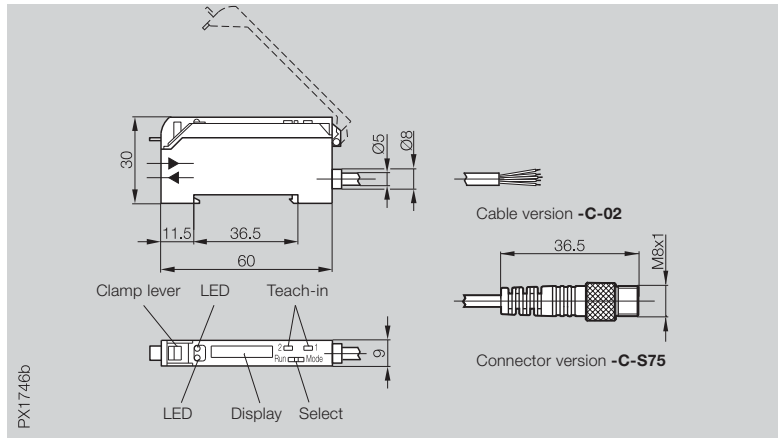
**Recommended accessories**

please order separately



Connector  
BKS-S 74/BKS-S 75

Series	BOS 73K
Plastic fiber optic base unit	for plastic fiber optics with outside diameter 2.2 mm
Sensing distance/range	depends on fiber optics



#### Base unit

PNP	BOS 73K-PU-1FR-C-02	BOS 73K-PU-1FR-C-S75-00,1
<b>Electrical data</b>		
Supply voltage $U_B$	11...26 V DC	
Ripple	≤ 10 %	
No-load supply current $I_0$ max.	≤ 50 mA	
Switching output	PNP-Transistor, open collector	
Switching type	Light-/dark-on (selectable)	
Output current	Switching output	100 mA
	Alarm output	50 mA
Voltage drop $U_d$ at $I_0$	≤ 2 V	
Settings	teach-in/manually using buttons	
<b>Optical data</b>		
Emitter, light type	LED, red light	
Wavelength	660 nm	
Light spot diameter	depends on fiber optics	
<b>Time data</b>		
Response time	Channel 1: 0.5 ms	Channel 2: 0.6 ms
Switching frequency $f$ (standard)	Channel 1: 1 kHz	Channel 2: 833 kHz
Time function	On- and/or off-delay 10...120 ms selectable	
<b>Indicators</b>		
Output function indicator	LED orange	
Stability indicator	LED green	
Display	Backlit LCD	
<b>Mechanical data</b>		
Connection	2 m cable, PVC	M8 connector, 4-pin
No. of wires × cross-section	5×0.2 mm <sup>2</sup>	
Housing material	PC	
Optical surface	depends on fiber optic cable	
Weight (incl. holder)	80 g	
<b>Ambient data</b>		
Degree of protection per IEC 60529	IP 54	
Polarity reversal protected	yes	
Short circuit protected	yes	
Ambient temperature range $T_a$	-25...+55 °C	
Ambient light rejection	Artificial light ≤ 10 kLux, sunlight ≤ 20 kLux	

Mounting materials included!

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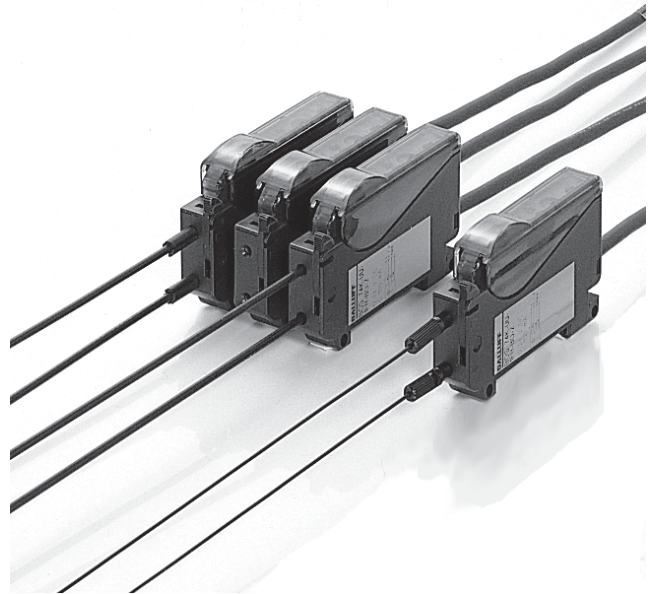
Connectors ... page 5.2 ...



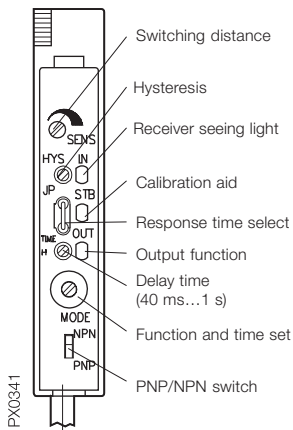
The **BOS 74K** offers maximum performance and adjusting flexibility (time functions, switching hysteresis) in various models for mastering even difficult applications.

**Features**

- Extended range
- 12-turn potentiometer for sensitivity setting
- Contamination indicator and alarm output
- Adjustable switching hysteresis
- Time functions (can be set from 40 ms...1 s)
- High-frequency version available (8 kHz)



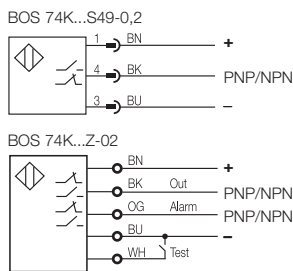
**Indicators and operating elements**



**BOS 74K function table**

Position	KV	EV	AV	WF	HS	DS	AE	AA	Function
0			■			■	■		KV: No delay
1				■					EV: On-delay
2	■						■	■	AV: Off-delay
3		■							WF: Wipe function
4			■		■				HS: Light-on
5				■	■		■		DS: Dark-on
6	■								AE: Alarm output NO
7		■			■				
8			■			■		■	AA: Alarm output normally closed
9				■					
A	■						■	■	■: Enabled
B		■							
C			■		■			■	
D				■	■			■	
E	■								
F		■							

**Wiring diagrams**



**Recommended accessories**

please order separately

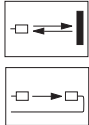
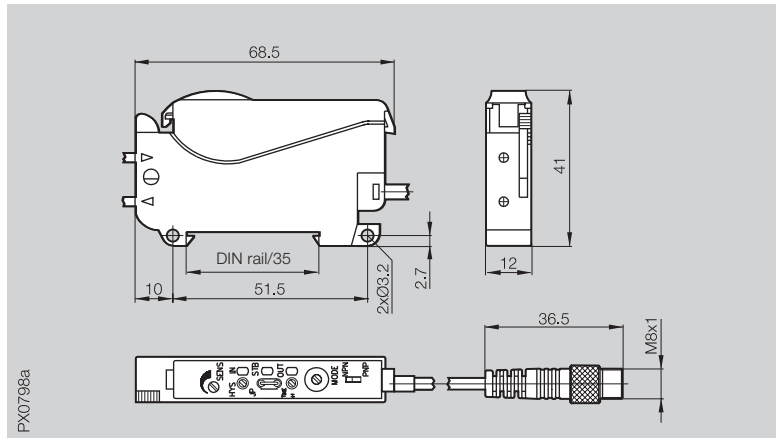


Mounting bracket  
BOS 74-HW-1



Connector  
BKS-\_48/BKS-\_49

Series	BOS 74K	BOS 74K	BOS 74K
Plastic fiber optic base unit	for plastic fiber optics with outside diameter 2.2 mm	for plastic fiber optics with outside diameter 2.2 mm	for plastic fiber optics with outside diameter 2.2 mm
Sensing distance/range	depends on fiber optic cable	depends on fiber optic cable	depends on fiber optic cable



### Base unit

PNP/NPN	BOS 74K-UU-1FR-B0-Z-S49-00,2	BOS 74K-UU-1FR-B0-Z-02	BOS 74K-UU-1FS-B0-Z-02
PNP/NPN			High-speed*
<b>Electrical data</b>			
Supply voltage $U_B$	10...30 V DC	10...30 V DC	10...30 V DC
Ripple	$\leq 10\%$	$\leq 10\%$	$\leq 10\%$
No-load supply current $I_0$ max.	$\leq 40$ mA	$\leq 40$ mA	$\leq 40$ mA
Switching output	PNP and NPN Transistor	PNP and NPN Transistor	PNP and NPN Transistor
Switching type	Light-/dark-on (selectable)	Light-/dark-on (selectable)	Light-/dark-on (selectable)
Output current	200 mA	200 mA	200 mA
	Switching output	50 mA	50 mA
	Alarm output	$\leq 2.5$ V	$\leq 2.5$ V
Voltage drop $U_d$ at $I_0$	$\leq 2.5$ V	$\leq 2.5$ V	$\leq 2.5$ V
Settings	12-turn potentiometer	12-turn potentiometer	12-turn potentiometer
Help functions		Test input	Test input
<b>Optical data</b>			
Emitter, light type	LED, red light	LED, red light	LED, red light
Wavelength	660 nm	660 nm	660 nm
Light spot diameter	depends on fiber optic cable	depends on fiber optic cable	depends on fiber optic cable
<b>Time data</b>			
Response time	$\leq 500$ $\mu$ s	$\leq 500$ $\mu$ s	$\leq 60$ $\mu$ s
Switching frequency $f$	1 kHz	1 kHz	8 kHz
Time functions	On-/off-delay selectable 40 ms...1 s	On-/off-delay selectable 40 ms...1 s	On-/off-delay selectable 40 ms...1 s
<b>Indicators</b>			
Output function indicator	LED red	LED red	LED red
Stability indicator	LED green	LED green	LED green
Receive indicator	LED yellow	LED yellow	LED yellow
<b>Mechanical data</b>			
Connection	0,2 m cable with M8 connector, 3-pin	2 m cable, PVC	2 m cable, PVC
No. of wires x cross-section		5x0.25 mm <sup>2</sup>	5x0.25 mm <sup>2</sup>
Housing material	PBT	PBT	PBT
Optical surface	depends on fiber optics	depends on fiber optics	depends on fiber optics
Weight	50 g	125 g	125 g
<b>Ambient data</b>			
Degree of protection per IEC 60529	IP 66	IP 66	IP 66
Polarity reversal protected	yes	yes	yes
Short circuit protected	yes	yes	yes
Ambient light rejection	10 kLux	10 kLux	10 kLux
Ambient temperature range $T_a$	-10...+60 °C	-10...+60 °C	-10...+60 °C

\*Range reduced by 30 %

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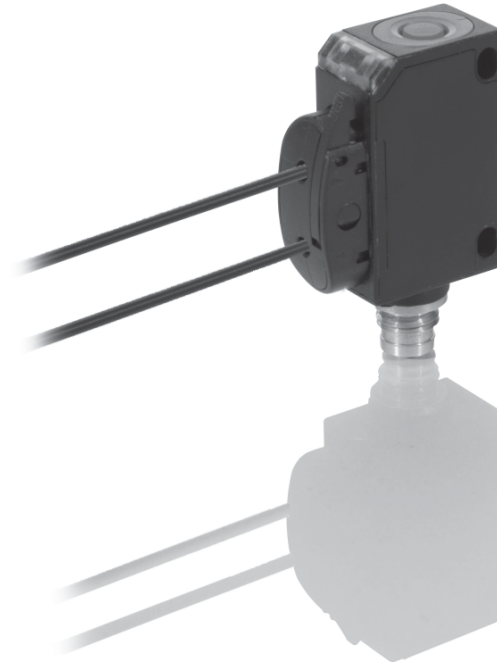
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Connectors ...  
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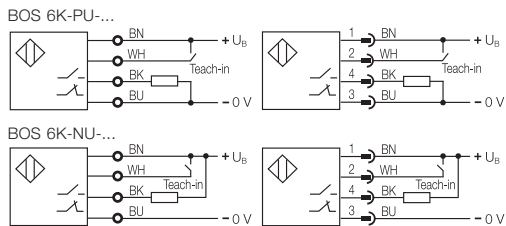
Series **BOS 6K** has been expanded to add a fiber optic base unit. The familiar teach-in concept has also been retained here. Together with the Series BFO fiber optics, an enclosure rating of IP 67 is provided.

**Features**

- Teach-in
- Contamination indicator
- Control line for ext. Teach-in
- Key disable



**Wiring diagrams**



**Recommended accessories**  
please order separately

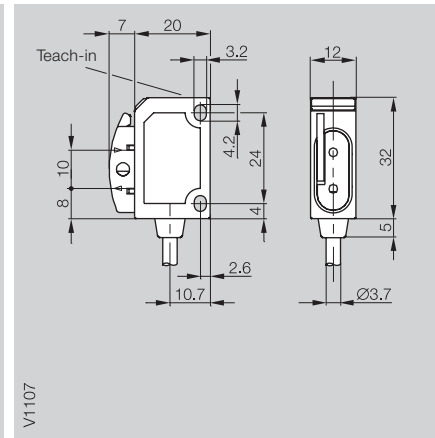
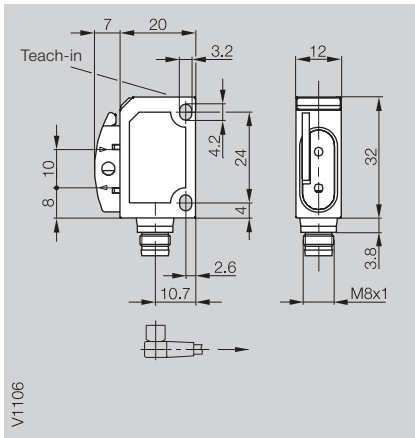


Mounting bracket  
BOS 6-HW-1



Connector  
BKS-S 74/BKS-S 75

Series	BOS 6K	BOS 6K
Plastic fiber optic base unit	for plastic fiber optics with outside diameter 2.2 mm	for plastic fiber optics with outside diameter 2.2 mm
Sensing distance/range	depends on fiber optics	depends on fiber optics



### Base unit

PNP	BOS 6K-PU-1FR-S75-C	BOS 6K-PU-1FR-C-02
NPN	BOS 6K-NU-1FR-S75-C	BOS 6K-NU-1FR-C-02
<b>Electrical data</b>		
Supply voltage $U_B$	10...30 V DC	10...30 V DC
Ripple	$\leq 15\%$ of $U_B$	$\leq 15\%$ of $U_B$
No-load supply current $I_0$ max.	$\leq 25$ mA	$\leq 25$ mA
Switching output	PNP- or NPN-Transistor	PNP- or NPN-Transistor
Switching type	Light-/dark-on (selectable)	Light-/dark-on (selectable)
Output current	100 mA	100 mA
Voltage drop $U_d$ at $I_0$	$\leq 2.4$ V	$\leq 2.4$ V
Settings	Teach-in	Teach-in
<b>Optical data</b>		
Emitter, light type	LED, red light	LED, red light
Wavelength	660 nm	660 nm
Light spot diameter	depends on range/sensing distance	depends on range/sensing distance
<b>Time data</b>		
Response time	0.5 ms	0.5 ms
Switching frequency $f$	1 kHz	1 kHz
<b>Indicators</b>		
Output function indicator	LED yellow	LED yellow
Stability indicator	LED green	LED green
<b>Mechanical data</b>		
Connection	M8 connector, 4-pin	2 m cable, PVC
No. of wires $\times$ cross-section		4 $\times$ 0.14 mm <sup>2</sup>
Housing material	ABS	ABS
Lens material	depends on fiber optic cable	depends on fiber optic cable
Weight	10 g	40 g
<b>Ambient data</b>		
Degree of protection per IEC 60529	IP 67	IP 67
Polarity reversal protected	yes	yes
Short circuit protected	yes	yes
Ambient light rejection	EN 60947-5-2	EN 60947-5-2
Ambient temperature range $T_a$	-20...+60 °C	-20...+60 °C



Connector orientation

2.2

2.3

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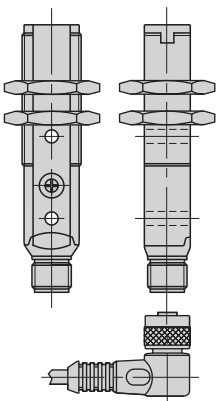
Connectors ... page 5.2 ...

The **BOS 18KF** fiber optic base unit represents a further addition to the Balluff standard series. Ease of operation and installation make this sensor a highlight, with the practical feature of DIN rail mounting.

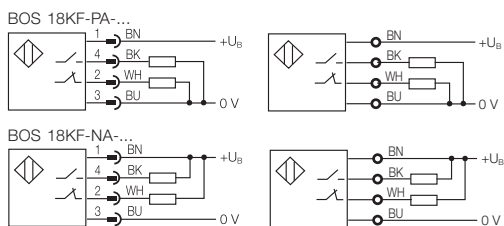
**Features**

- Sensitivity setting with a 270° potentiometer
- Cover nut for fiber optic cable adapting

**Connector orientation**



**Wiring diagrams**



**Recommended accessories**  
please order separately



Mounting clamp  
BOS 18,0-KB-1

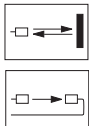
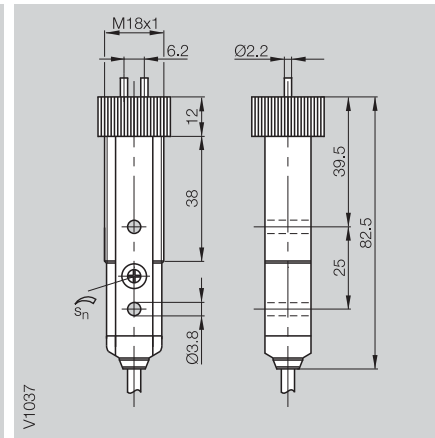
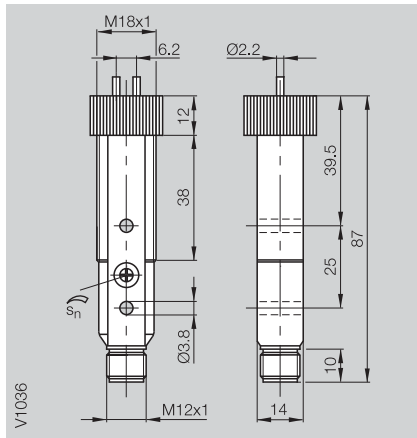


Mounting bracket  
BES 18-HW-1



Connector  
BKS-\_ 19/BKS-\_ 20

Series	BOS 18KF	BOS 18KF
Plastic fiber optic base unit	for plastic fiber optics with outside diameter 2.2 mm	for plastic fiber optics with outside diameter 2.2 mm
Sensing distance/range	depends on fiber optics	depends on fiber optics



### Base unit

PNP	BOS 18KF-PA-1FR-S4-C	BOS 18KF-PA-1FR-C-02
NPN	BOS 18KF-NA-1FR-S4-C	BOS 18KF-NA-1FR-C-02
<b>Electrical data</b>		
Supply voltage $U_B$	10...30 V DC	10...30 V DC
Ripple	$\leq 2$ V	$\leq 2$ V
No-load supply current $I_0$ max.	$\leq 35$ mA	$\leq 35$ mA
Switching output	PNP- or NPN-Transistor	PNP- or NPN-Transistor
Switching type	Light- and dark-on	Light- and dark-on
Output current	100 mA	100 mA
Voltage drop $U_d$ at $I_0$	$\leq 2$ V	$\leq 2$ V
Settings	Potentiometer 270°	Potentiometer 270°
<b>Optical data</b>		
Emitter, light type	LED, red light	LED, red light
Wavelength	660 nm	660 nm
Light spot diameter	depends on range/sensing distance	depends on range/sensing distance
<b>Time data</b>		
Response time	0.5 ms	0.5 ms
Switching frequency $f$	1 kHz	1 kHz
<b>Indicators</b>		
Output function indicator	LED yellow	LED yellow
Stability indicator	LED green	LED green
<b>Mechanical data</b>		
Connection	M12 connector, 4-pin	2 m cable, PVC
No. of wires $\times$ cross-section		4 $\times$ 0.14 mm <sup>2</sup>
Housing material	PBT	PBT
Lens material	depends on fiber optic cable	depends on fiber optic cable
Weight	25 g	75 g
<b>Ambient data</b>		
Degree of protection per IEC 60529	IP 67	IP 67
Polarity reversal protected	yes	yes
Short circuit protected	yes	yes
Ambient light rejection	EN 60947-5-2	EN 60947-5-2
Ambient temperature range $T_a$	-25...+55 °C	-25...+55 °C

2.2

2.3

Photoelectric sensors accessories page 2.3.2 ...

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Connectors ... page 5.2 ...