


Photoelectric Special Sensors

Color sensors BFS

Product overview

Type	Sensing distance/Range	Light type	Output				Switching type		Switching frequency	U _s				Connection			Special features			Page
			3×PNP transistor	3×Push-pull	RS485 interface	RS 232 interface	Light switching	Dark switching		10...30 V DC	12...28 V DC	18...30 V DC	24 V	M12 plug, 8-pin	M12 plug, 5-pin	Cable	Color intensity measurement	Color scan	True color	
 Color sensors																				
BFS0001	BFS 26K-PS-L01-S115	12...32 mm	■	■			■	500 Hz	■				■				■		305	
BFS0002	BFS 26K-PS-L02-S115-C	15...30 mm	■	■			■	500 Hz	■				■				■		305	
BFS0003	BFS 26K-PS-L03-S115-C	18...22 mm	■	■			■	500 Hz	■				■				■		305	
BFS000F	BFS 26K-GI-L04-S92	12...32 mm	■				■	500 Hz		■				■					305	
BFS0008	BFS 27K-PS-L01-S115	5...45 mm	■	■			■	1.5 kHz	■				■				■		307	
BFS000A	BFS 27K-PSR-L01-S115	5...45 mm	■	■	■		■	1.5 kHz	■				■				■		307	
BFS0009	BFS 27K-PS-L02-S115	5...45 mm	■	■			■	500 Hz	■				■						307	
BFS000C	BFS 27K-PSR-L02-S115	5...45 mm	■	■	■		■	500 Hz	■				■				■		307	
BFS000L	BFS 33M-GSS-F01-PU-02	400 mm	■		■	■	■	1.5 kHz					■				■		309	



Photoelectric sensors

Photoelectric standard sensors

Photoelectric special sensors

Optical fiber base units

Fiber optics

Contrast sensor

Luminescence sensor

Color sensors

Fork sensors

Angle sensors

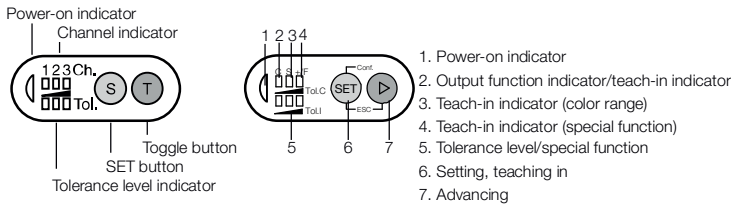
Dynamic optical windows

Light grids

Photoelectric distance sensors for analog distance measurement

Special accessories for photoelectric sensors

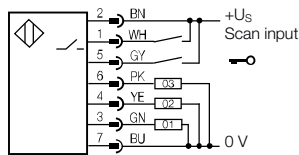
Indicators and operating elements



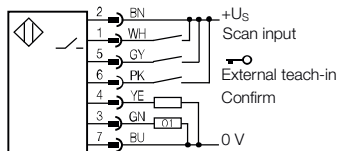
Wiring diagrams

BFS 26K-PS...

Two modes are available.
1. Normal mode "factory setting"

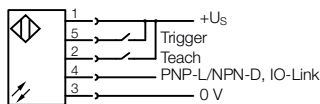


2. External Teach-in setting using "special functions"

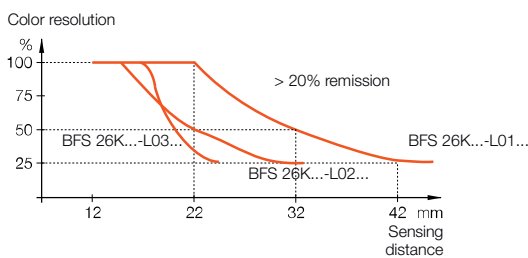


Disabling input:
> 12 V = Buttons locked,
< 3 V = Buttons not locked

BFS 26K-GI...



Color resolution/sensing distance diagram



Recommended accessories
(please order separately)

Description	Ordering code
Mounting bracket	BAM00TK



More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessory Product Line** catalog.

Series	
Working range	
Diffuse mode working range	
Retroreflective working range	
3x PNP	Ordering code
	Part number
1x Push-pull, IO-Link	Ordering code
	Part number
Supply voltage U_B	
No-load supply current I_0 max.	
Output current	
Switching type	
Polarity reversal/short-circuit protected	
Settings	
Emitter, light type	
Light spot geometry	
Light spot diameter	
Sensing distance tolerance	
Color resolution tolerance	
Ready indicator	
Output function indicator Ch. 1...Ch. 3	
Output function indicator Tol. 1...Tol. 5	
Ready delay	
Response time	
Switching frequency	
Time function	
Degree of protection as per IEC 60529	
Ambient temperature T_a	
Permissible ambient light	
Material	Housing
	Optical surface
Connection	

Suitable connector
(please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M12, 8-pin	Straight	PUR	Black	2 m	BCC06K2
M12, 8-pin	Angled	PUR	Black	2 m	BCC06K5

Connectors without LED are suitable for PNP and NPN sensors.

More electrical accessories: You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.

Photoelectric Special Sensors

Color Sensors BFS 26K



Photoelectric sensors

Photoelectric standard sensors

Photoelectric special sensors

Optical fiber base units

Fiber optics

Contrast sensor

Luminescence sensor

Color sensors

Fork sensors

Angle sensors

Dynamic optical windows

Light grids

Photoelectric distance sensors for analog distance measurement

Special accessories for photoelectric sensors

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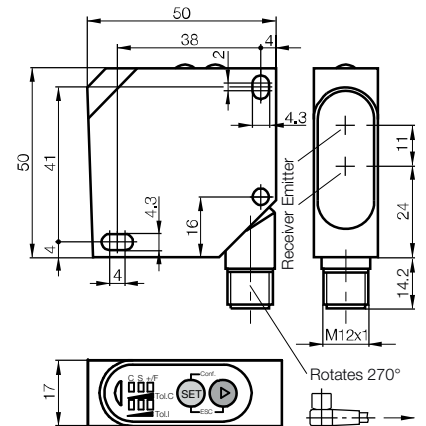
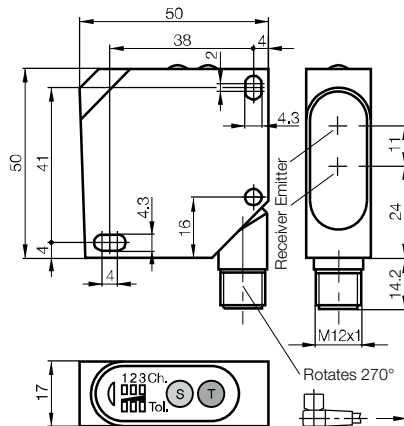
Special accessories for photoelectric sensors

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Special accessories for photoelectric sensors

	BFS 26K	BFS 26K	BFS 26K	BFS 26K
	12...32 mm	15...30 mm	18...22 mm	12...32 mm
	50...200 mm			
	BFS0001	BFS0002	BFS0003	BFS000F
	BFS 26K-PS-L01-S115	BFS 26K-PS-L02-S115-C	BFS 26K-PS-L03-S115-C	BFS 26K-GI-L04-S92
	12...28 V DC	12...28 V DC	12...28 V DC	18...30 V DC
	≤ 40 mA	≤ 40 mA	≤ 40 mA	≤ 40 mA
	100 mA	100 mA	100 mA	100 mA
	Light switching	Light switching	Light switching	Light/dark switching (selectable)
	Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
	Teach-in	Teach-in	Teach-in	Teach-in
	Pulsed white light	Pulsed white light	Pulsed white light	Pulsed white light
	Round	Square	Rectangular	Round
	Ø 4 mm at 22 mm sensing distance	2x2 mm at 22 mm sensing distance	5x1 mm at 22 mm sensing distance	Ø 4 mm at 22 mm sensing distance
	±6 mm at Tol.3	±5 mm at Tol.3	±2 mm at Tol.3	±6 mm at Tol C3 and Tol I2
	Adjustable in 5 levels	Adjustable in 5 levels	Adjustable in 5 levels	
	Green LED	Green LED	Green LED	
	3xYellow LED	3xYellow LED	3xYellow LED	
	3xRed LED	3xRed LED	3xRed LED	
	300 ms	300 ms	300 ms	300 ms
	1 ms	1 ms	1 ms	
	500 Hz	500 Hz	500 Hz	500 Hz (SIO mode)
	50 ms release delay selectable	50 ms release delay selectable	50 ms release delay selectable	50 ms release delay selectable
	IP 67	IP 67	IP 67	IP 67
	-10...+55 °C	-10...+55 °C	-10...+55 °C	-10...+55 °C
	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
	Impact-resistant ABS	Impact-resistant ABS	Impact-resistant ABS	Impact-resistant ABS
	PMMA	PMMA	PMMA	PMMA
	M12 connector, 8-pin	M12 connector, 8-pin	M12 connector, 8-pin	M12 connector, 5-pin



Variants

The BFS 27K-...-L01 with a switching frequency of 1.5 kHz is designed for color detection in fast processes, such as industrial packaging of food products or pharmaceutical products. The BFS 27K-...-L02 variant is distinguished by excellent color sensitivity for dark colors. This makes it outstanding for quality assurance and for parts detection.

Operating modes

C Color type

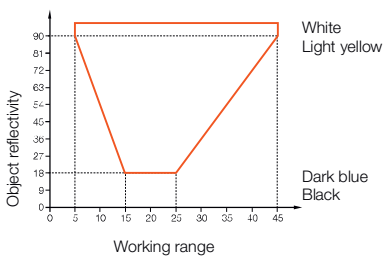
In C mode the sensor uses increased depth of field (contrast). This is used for detecting colors on shiny, highly reflective or matte surfaces.

C+I Color type + intensity

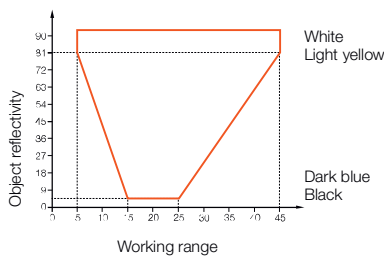
In the C+I setting, color intensity is also evaluated. This allows even the finest color nuances to be distinguished. Even the finest gray levels can be detected.

Function diagrams

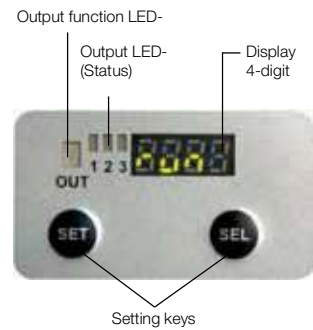
BFS 27K-...-L01



BFS 27K-...-L02

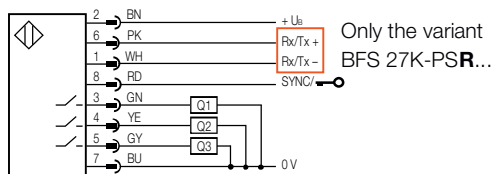


Operating panel and display



Wiring diagram

BFS 27K-PS...
PNP



Recommended accessories
(please order separately)

Description	Ordering code
① Mounting bracket	BAM00TK
② Adapter plate	BAM00T7
③ Clamping block	BAM00T3



Suitable connector
(please order separately)

Size	Design	Cable material	Color	Length	Ordering code
M12, 8-pin	Straight	PUR	Black	2 m	BCC06K2
M12, 8-pin	Angled	PUR	Black	2 m	BCC06K5



Connectors without LED are suitable for PNP and NPN sensors.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessory Product Line** catalog.

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Color sensors BFS 27K



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Optical fiber base units

Fiber optics

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Luminescence sensor

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Angle sensors

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Light grids

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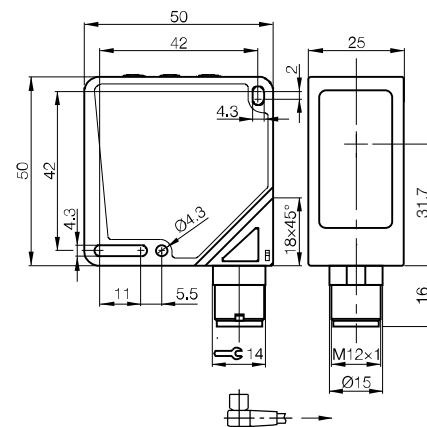
Special accessories for photoelectric sensors

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Special accessories for photoelectric sensors

Series		BFS 27K	BFS 27K
Diffuse mode working range		5...45 mm*	5...45 mm*
3× PNP	Ordering code	BFS0008	BFS0009
	Part number	BFS 27K-PS-L01-S115	BFS 27K-PS-L02-S115
3× PNP	Ordering code	BFS000A	BFS000C
RS485 interface	Part number	BFS 27K-PSR-L01-S115	BFS 27K-PSR-L02-S115
Supply voltage U_B		10...30 V DC	10...30 V DC
No-load supply current I_0 max.		≤ 60 mA	≤ 60 mA
Output current		100 mA	100 mA
Switching type		Light switching	Light switching
Polarity reversal/short-circuit protected		Yes/Yes	Yes/Yes
Settings		Teach-in	Teach-in
Emitter, light type		LED, white light	LED, white light
Wavelength		400...700 nm	400...700 nm
Light spot diameter		≥ 4 mm	≥ 4 mm
Tolerance levels		10 per channel (can be set)	10 per channel (can be set)
Display		4-digit 7-segment display in green	4-digit 7-segment display in green
Output function indicator		Yellow LED	Yellow LED
Output indicator		3×Green LED	3×Green LED
Response time		335 μs	5 ms (standard), 1 ms (fast)
Switching frequency		1.5 kHz	100 Hz (standard), 500 Hz (fast)
Time function		Pulse stretching 0...40 ms	Pulse stretching 0...40 ms
Degree of protection as per IEC 60529		IP 67	IP 67
Ambient temperature T_a		-10...+55 °C	-10...+55 °C
Material	Housing	ABS	ABS
	Optical surface	Glass	Glass
Connection		M12 connector, 8-pin	M12 connector, 8-pin

*see function diagrams



Software

The software for the R model (RS485) can be downloaded for free at our homepage www.balluff.de.

www.balluff.de

Service

Downloads

Software

Select a product

For distinguishing between the smallest of color nuances at the highest level

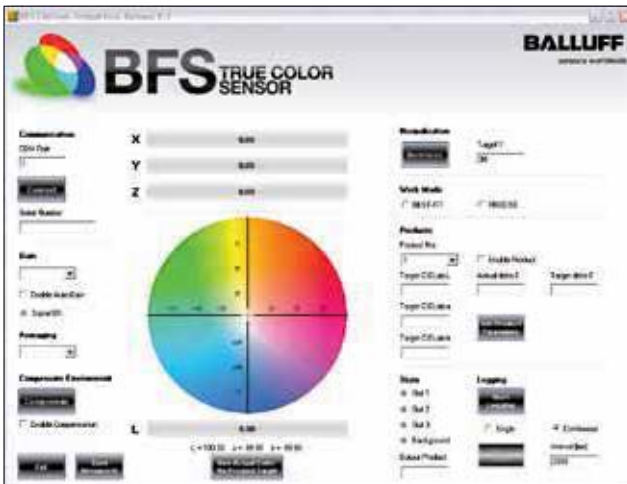
The True Color sensor BFS 33M is in a completely different league to conventional RGB sensors. Thanks to its high resolution, it not only detects colors but can also reliably distinguish between nuances. The True Color sensor thus detects, for instance minimal color deviations in injection molded parts. And it can also tell if a metal enters production polished or unpolished. Faded colors or poor print quality are detected in an instant and separated. It thus opens up completely new dimensions in quality control. The sensor uses three digital outputs and a serial interface to perform evaluations. The lab color space values are transmitted directly via this interface.

Features

- Detection of and distinguishing between a random number of colors
- Reliably distinguishes between the smallest of color nuances
- Large sensing distance up to 400 mm
- Simple configuration and visualization using software
- Robust metal housing

Industries

- Automotive industry
- Plastics processing
- Packaging industry
- Handling and assembly
- Printing industry
- Wood processing



+ Recommended accessories
(please order separately)

Description	Ordering code
① Optical fiber M4 (coaxial), 2 m long	BFO00C9
② Optics (short-range), 7 mm, screwed onto M4 optical fiber	BAM00NT
③ Optical fiber M6 (coaxial), 1 m long	BFO00FP
④ Optical fiber M6 (coaxial), 2 m long	BFO00C4
⑤ Optical fiber M6 (coaxial), 5 m long	BFO00FN
⑥ Optics (adjustable), 200 mm sensing distance, screwed onto M6 optical fiber	BAM01U2
⑦ Optics (long-range), 400 mm sensing distance, screwed onto M6 optical fiber	BAM01PA
⑧ Interface cable (shielded)	BCC0ARP
⑨ RS232/USB interface converter	BAE009A



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Photoelectric Special Sensors

True color sensor BFS 33M



Photoelectric sensors

Photoelectric standard sensors

Photoelectric special sensors

Optical fiber base units

Fiber optics

Contrast sensor

Luminescence sensor

Color sensors

Fork sensors

Angle sensors

Dynamic optical windows

Light grids

Photoelectric distance sensors

for analog distance measurement

Special accessories for photoelectric sensors

Series	BFS 33M
Working range	up to 400 mm (with additional optics)
3× Push-pull	Ordering code BFS00L
RS 232 interface	Part number BFS 33M-GSS-F01-PU-02
Supply voltage U_B	24 V DC $\pm 10\%$
No-load supply current I_0 max.	40 mA
Output current	30 mA
Polarity reversal/short-circuit protected	Yes/Yes
Settings	via software
Emitter, light type	LED, white light
Color space	CIE Lab
Light spot diameter	Depends on the fiber optics
Color resolution tolerance	Adjustable (software)
Resolution	8 amplifier stages of 12 bits each
Color resolution	< 0.5 dE
Repeat accuracy	< 1 dE
Ready indicator	Green LED
Output function indicator Ch. 1...Ch. 3	3× Yellow LED (binary encoding)
Response time	0.33 ms
Switching frequency	1.5 kHz
Degree of protection as per IEC 60529	IP 54
Ambient temperature T_a	+10...+55 °C
Permissible ambient light	EN 60947-5-2
Housing material	Al coated
Connection	2 m PUR cable, 5×0.25 mm ²

Wiring diagram

