

The series **BFS 26K** and **BFS 27K** color sensors operate using pulsed white light, making them particularly insensitive to ambient light. The light reflected back from the object is received and processed by three different receivers (red, green, blue).

Applications

Color sensors open up a wide field of various applications, such as in the packaging industry, robotics, automation, quality assurance or in the process industry.

Simplify and speed up automated processes using these versatile color sensors – for detecting color shades in carpets or textiles, as well as color markings on packaging or labels.

With dimensions of just 50x50x17 mm and a rotatable connector, the **BFS 26K** fits in tight areas and can be programmed either using a control line or by means of 2 keys via teach-in.

The various light spot geometry configurations of the respective sensors (round, rectangular or square) allow even the smallest color markings to be reliably discriminated.

Numerous special functions such as color scanning, pulse expansion and blanking input provide additional application flexibility.

Features

- Microcontroller-based
- Pulsed white light
- Various light spot geometries
- Teach-in and external teach-in
- M12 connector rotatable by 270°
- 3 different colors can be identified at the same time
- 5-stage adjustable color tolerance




The **BFS 27K** with a clearly organized operating panel and large display enables simple teaching of various colors and selection of all functions using teach-in.

Modes C (color type) and C+I (color type + intensity) as well as 10 tolerance levels can be set separately for all 3 channels. Pulse extension of 0..40 ms can also be selected and is applied to all channels.

Balluff sensorware allows the set functions to be visualized over the RS 485 interface.

Features

- Display
- Autocollimation
- Versions with high switching frequency or for dark colors
- Color type or color type + intensity modes
- Serial interface RS485

Type	Sensing distance	Light type	Output	Output function	Switching frequency	U _B	Connection	Special features	Page
		White light	3 × PNP-Transistor 3 × NPN-Transistor Interface RS485	Light-on		10...30 V DC 12...28 V DC	M12 connector, 8-pin	Reflector mode Color intensity measurement Color scan	
 Color Sensors									
BFS 26K-PS-L01-S115	12...32 mm	■	■	■	500 Hz	■	■	■	2.2.79
BFS 26K-PS-L02-S115-C	15...30 mm	■	■	■	500 Hz	■	■	■	2.2.79
BFS 26K-PS-L03-S115-C	18...22 mm	■	■	■	500 Hz	■	■	■	2.2.79
BFS 27K-PS-L01-S115	5...45 mm	■	■	■	1.5 kHz	■	■	■	2.2.81
BFS 27K-NS-L01-S115	5...45 mm	■	■	■	1.5 kHz	■	■	■	2.2.81
BFS 27K-PSR-L01-S115	5...45 mm	■	■	■	1.5 kHz	■	■	■	2.2.81
BFS 27K-NSR-L01-S115	5...45 mm	■	■	■	1.5 kHz	■	■	■	2.2.81
BFS 27K-PS-L02-S115	5...45 mm	■	■	■	500 Hz	■	■	■	2.2.81
BFS 27K-NS-L02-S115	5...45 mm	■	■	■	500 Hz	■	■	■	2.2.81
BFS 27K-PSR-L02-S115	5...45 mm	■	■	■	500 Hz	■	■	■	2.2.81
BFS 27K-NSR-L02-S115	5...45 mm	■	■	■	500 Hz	■	■	■	2.2.81

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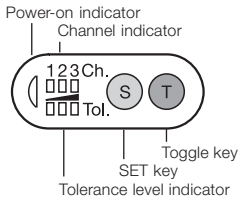
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Photoelectric sensors accessories page 2.3.2 ...

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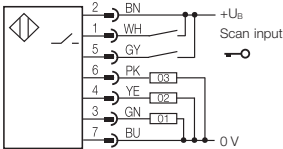
Connectors ... page 5.2 ...

Indicators and operating elements

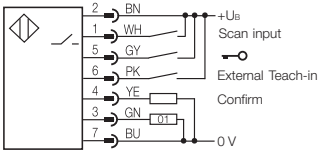


Wiring diagrams

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

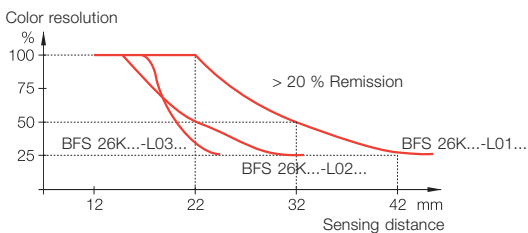


2. External Teach-in setting using „special functions“



⚡ Disabling input:
> 12 V = keys disabled
< 3 V = keys not disabled

Color resolution/Sensing distance diagram



Recommended accessories
please order separately



Mounting bracket
BOS 26-HW-1



Connector
BKS-S139-PU-05

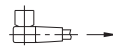
Series	
Working range	Diffuse mode
Working range	Reflector mode



Color sensor



PNP
Electrical data
Supply voltage U_B
Ripple
No-load supply current I_0 max.
Switching output
Output current
Switching type
Voltage drop U_d at I_e
Settings
Optical data
Emitter, light type
Light spot geometry
Light spot diameter
Sensing distance tolerance
Color resolution tolerance
Indicators
Power-on indicator
Output function indicator Ch. 1...Ch. 3
Output function indicator Tol. 1...Tol. 5
Time data
Ready delay
Response time
Switching frequency f
Time functions
Mechanical data
Dimensions
Connection
Housing material
Optical surface
Weight
Ambient data
Degree of protection per IEC 60529
Polarity reversal protected
Short circuit protected
Ambient temperature range T_a
Ambient light rejection per

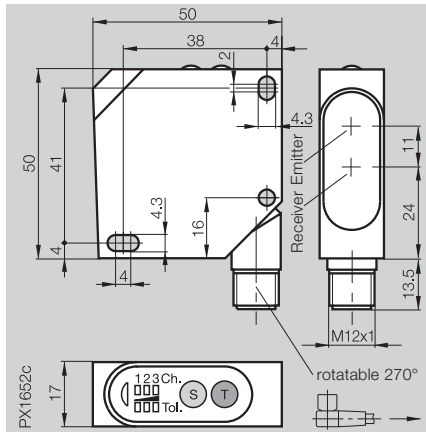
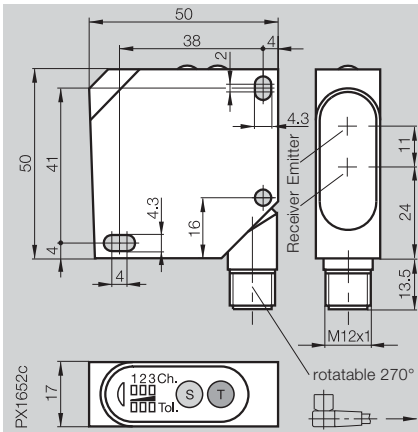
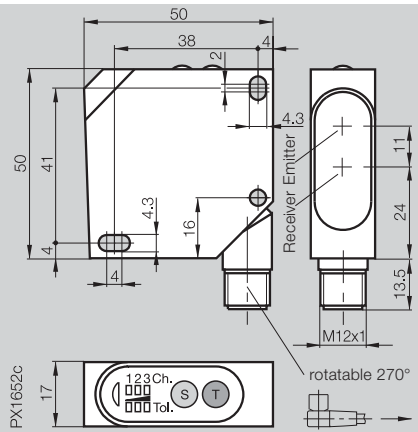


Connector orientation

BFS 26K
12...32 mm
50...200 mm

BFS 26K
15...30 mm

BFS 26K
18...22 mm



BFS 26K-PS-L01-S115

BFS 26K-PS-L02-S115-C

BFS 26K-PS-L03-S115-C

12...28 V DC

10 %

≤ 40 mA

3 × PNP-Transistor

100 mA

Light-on

≤ 2.4 V

Teach-in

12...28 V DC

10 %

≤ 40 mA

3 × PNP-Transistor

100 mA

Light-on

≤ 2.4 V

Teach-in

12...28 V DC

10 %

≤ 40 mA

3 × PNP-Transistor

100 mA

Light-on

≤ 2.4 V

Teach-in

Pulsed white light
round

∅ 4 mm at 22 mm sensing distance
±6 mm for Tol. 3
settable in 5 levels

LED green

3 × LED yellow

3 × LED red

300 ms

1 ms

500 Hz

50 ms turn-off delay selectable

50×50×17 mm

M12 connector, 8-pin
impact-resistant ABS

PMMA

40 g

IP 67

yes

yes

-10...+55 °C

EN 60947-5-2

Pulsed white light
square

2×2 mm at 22 mm sensing distance
±5 mm for Tol. 3
settable in 5 levels

LED green

3 × LED yellow

3 × LED red

300 ms

1 ms

500 Hz

50 ms turn-off delay selectable

50×50×17 mm

M12 connector, 8-pin
impact-resistant ABS

PMMA

40 g

IP 67

yes

yes

-10...+55 °C

EN 60947-5-2

Pulsed white light
rectangular

5×1 mm at 22 mm sensing distance
±2 mm for Tol. 3
settable in 5 levels

LED green

3 × LED yellow

3 × LED red

300 ms

1 ms

500 Hz

50 ms turn-off delay selectable

50×50×17 mm

M12 connector, 8-pin
impact-resistant ABS

PMMA

40 g

IP 67

yes

yes

-10...+55 °C

EN 60947-5-2

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Variants

The BFS 27K-...-L01 with a switching frequency of 1.5 kHz is designed for color detection in fast processes, such as packaging in the food industry or of pharmaceutical products.

The BFS 27K-...-L02 variant features excellent color sensitivity with dark colors. This makes it outstanding for quality assurance and for parts detection.

Operating modes

C Color type

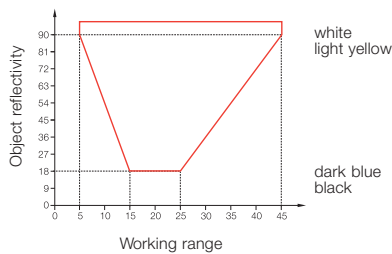
In C mode the sensor uses increased depth of field (contrast). This is used for detecting colors on shiny, highly reflective or matte surfaces.

C+I Color type + intensity

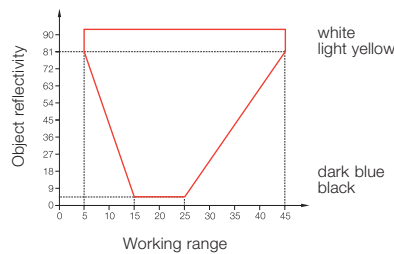
In the C+I setting color intensity is also evaluated. This allows even the finest color nuances to be discriminated. Even the finest gray levels can be detected.

Function diagrams

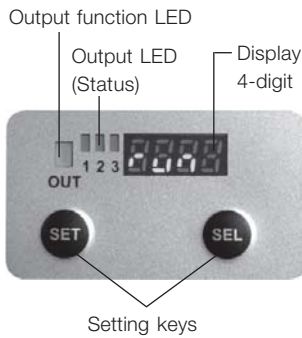
BFS 27K-...-L01



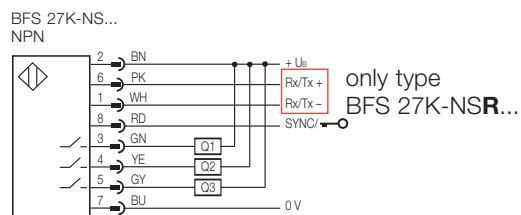
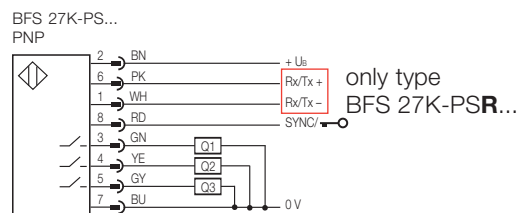
BFS 27K-...-L02



Operating panel and display



Wiring diagrams



Recommended accessories

please order separately



Mounting bracket
BOS 35-HW-1



Adapter plate
BOS 21-AD-1

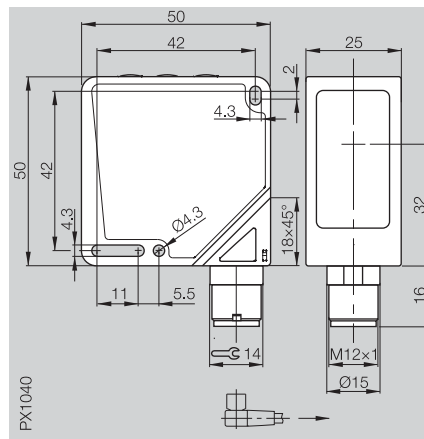
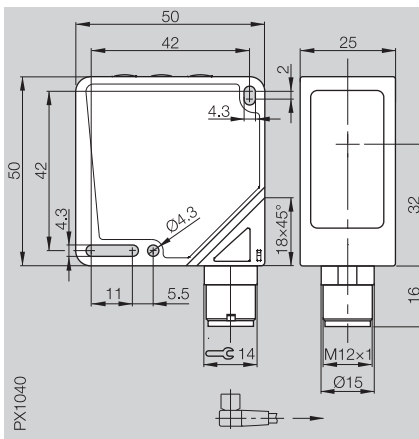


Mounting clamp
with ball joint
BOS 18,0-KB-1



Connector
right-angle, 5 m
BKS-S138-PU-05
straight, 5 m
BKS-S139-PU-05

Series	BFS 27K	BFS 27K
Working range	5...45 mm*	5...45 mm*



Color sensor

PNP	BFS 27K-PS-L01-S115	BFS 27K-PS-L02-S115
NPN	BFS 27K-NS-L01-S115	BFS 27K-NS-L02-S115
PNP with RS485	BFS 27K-PSR-L01-S115	BFS 27K-PSR-L02-S115
NPN with RS485	BFS 27K-NSR-L01-S115	BFS 27K-NSR-L02-S115

Electrical data

Supply voltage U_B	10...30 V DC	10...30 V DC
Ripple	≤ 2 V	≤ 2 V
No-load supply current I_0 max.	≤ 60 mA	≤ 60 mA
Switching output	3 x PNP- or NPN-Transistor	3 x PNP- or NPN-Transistor
Output current	100 mA	100 mA
Switching type	Light-on	Light-on
Voltage drop U_d at I_0	≤ 2 V	≤ 2 V
Settings	Teach-in	Teach-in

Optical data

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)

Indicators

Display	4-digit 7-segment display green	4-digit 7-segment display green
Output function indicator	LED yellow	LED yellow
Output indicator	3 x LED green	3 x LED green

Time data

Response time	335 μ s	5 ms (standard), 1 ms (fast)
Switching frequency f	1.5 kHz	100 Hz (standard), 500 Hz (fast)
Time functions	Pulse lengthening 0...40 ms	Pulse lengthening 0...40 ms

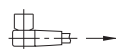
Mechanical data

Dimensions	50x50x25 mm	50x50x25 mm
Connection	M12 connector, 8-pin	M12 connector, 8-pin
Housing material	ABS	ABS
Optical surface	Glass	Glass
Weight	100 g	100 g

Ambient data

Degree of protection per IEC 60529	IP 67	IP 67
Polarity reversal protected	yes	yes
Short circuit protected	yes	yes
Ambient temperature range T_a	-10...+55 °C	-10...+55 °C

*see function diagrams



Connector orientation

Software

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

www.balluff.de

Document type

Software/Descriptions

Software for the BFS 27K

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