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DATA SHEET

**WTB4FA-21A111A0ZZZ**

W4  
Photoelectric sensors

**SICK** Sensor Intelligence

## PHOTOELECTRIC SENSORS

# WT- B4FA-21A111A0ZZZ



Illustration may differ

### ORDERING INFORMATION

Type	part no.
WTB4FA-21A111A0ZZZ	1150068

Further device versions and accessories at [www.sick.com/W4](http://www.sick.com/W4)



### DETAILED TECHNICAL DATA

#### FEATURES

Functional principle	Photoelectric proximity sensor	
Functional principle detail	Background suppression, LineSpot technology	
Sensing range	Sensing range min.	7 mm
	Sensing range max.	55 mm
	Reference object	Object with 90% remission factor (complies with standard white according to DIN 5033)
	Minimum distance between set sensing range and background (black 6% / white 90%)	1 mm, at a distance of 50 mm
Emitted beam	Light source	PinPoint LED
	Type of light	Visible red light
	Shape of light spot	Line-shaped
	Light spot size (distance)	1.4 mm x 19 mm (50 mm)
	Maximum dispersion of the emitted beam around the standardized transmission axis (squint angle)	< +/- 1.5° (at T <sub>0</sub> = +23 °C)
Key LED figures	Normative reference	EN 62471:2008-09   IEC 62471:2006, modified
	LED risk group marking	Free group
	Wave length	635 nm
	Average service life	100,000 h at T <sub>a</sub> = +25 °C
Adjustment	None	-
Display	LED blue	BluePilot: sensing range indicator
	LED green	Operating indicator Static on: power on
	LED yellow	Status of received light beam

	Static on: object present Static off: object not present
Special features	Sensing range preset: 55 mm

## SAFETY-RELATED PARAMETERS

MTTF <sub>D</sub>	1,720 years
DC <sub>avg</sub>	0 %
T <sub>M</sub> (mission time)	20 years

## ELECTRONICS

Supply voltage U <sub>B</sub>	10 V DC ... 30 V DC <sup>1)</sup>
Ripple	≤ 5 V <sub>pp</sub>
Usage category	DC-12 (According to EN 60947-5-2) DC-13 (According to EN 60947-5-2)
Current consumption	≤ 25 mA, without load. At U <sub>B</sub> = 24 V
Protection class	III
Digital output	
Number	1
Type	PNP
Switching mode	Light switching
Signal voltage PNP HIGH/LOW	Approx. U <sub>B</sub> -2.5 V / 0 V
Output current I <sub>max</sub>	≤ 100 mA
Circuit protection outputs	Reverse polarity protected Overcurrent protected Short-circuit protected
Response time	≤ 500 μs <sup>2)</sup>
Repeatability (response time)	150 μs
Switching frequency	1,000 Hz <sup>3)</sup>
Pin/Wire assignment	
Function of pin 4/black (BK)	Digital output, light switching, object present → output Q HIGH

<sup>1)</sup> Limit values.

<sup>2)</sup> Signal transit time with resistive load in switching mode.

<sup>3)</sup> With light/dark ratio 1:1.

## MECHANICS

Housing	Rectangular
Design detail	Flat
Dimensions (W x H x D)	16 mm x 40.1 mm x 12.1 mm
Connection	Connector M8, 3-pin
Material	
Housing	Plastic, VISTAL®
Front screen	Plastic, PMMA
Cable	Plastic, PVC
Male connector	Plastic, VISTAL®
Weight	Approx. 30 g
Maximum tightening torque of the fixing screws	0.4 Nm

## AMBIENT DATA

Enclosure rating	IP66 (EN 60529) IP67 (EN 60529)
Ambient operating temperature	-40 °C ... +60 °C

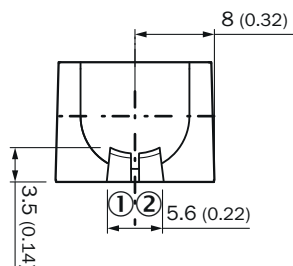
# PHOTOELECTRIC SENSORS - WTB4FA-21A111A0ZZZ

Ambient temperature, storage	-40 °C ... +75 °C
Typ. Ambient light immunity	Artificial light: ≤ 50,000 lx Sunlight: ≤ 50,000 lx
Shock resistance	30 g, 11 ms (3 positive and 3 negative shocks along X, Y, Z axes, 18 total shocks (EN60068-2-27))
Vibration resistance	10 Hz ... 1,000 Hz (Amplitude 1 mm, 3 x 30 min (EN60068-2-6))
Air humidity	35 % ... 95 %, relative humidity (no condensation)
Electromagnetic compatibility (EMC)	EN 60947-5-2
Resistance to cleaning agent	ECOLAB
UL File No.	NRKH.E181493 & NRKH7.E181493

## CERTIFICATES

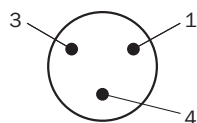
EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
Moroccan declaration of conformity	✓
China RoHS	✓
ECOLAB certificate	✓
cULus certificate	✓
Photobiological safety (DIN EN 62471) certificate	✓

## DISPLAY AND ADJUSTMENT ELEMENTS

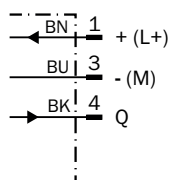


- ① LED green
- ② LED yellow

## CONNECTION TYPE CONNECTOR M8, 3-PIN



## CONNECTION DIAGRAM CD-045

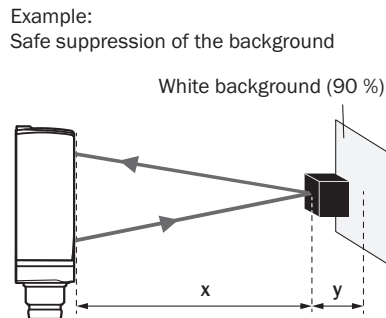
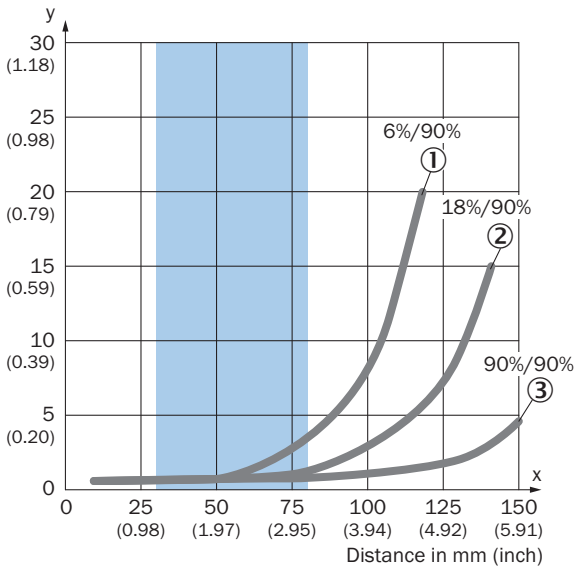


**TRUTH TABLE PNP - LIGHT SWITCHING**

	Light switching Q (normally open (upper switch), normally closed (lower switch))	
	Object not present → Output LOW	Object present → Output HIGH
Light receive	✗	✓
Light receive indicator	✗	☀
Load resistance to M	✗	⚡

**CHARACTERISTIC CURVE**

Minimum distance in mm (y) between the set sensing range and white background (90 % remission)



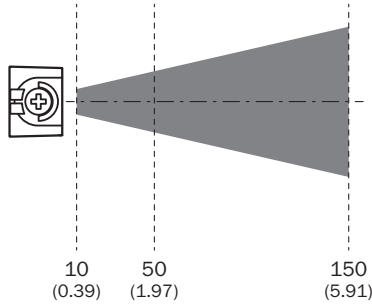
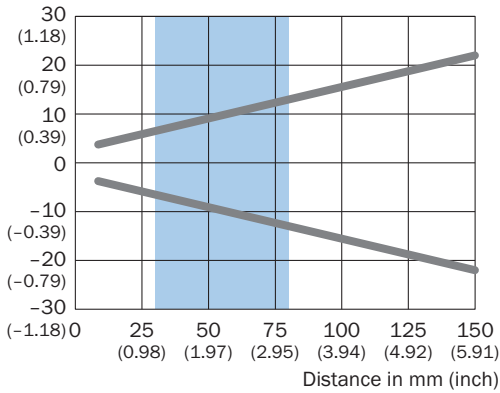
Example:  
Safe suppression of the background  
White background (90 %)  
Black object (6 % remission)  
Set sensing range x = 100 mm  
Needed minimum distance to white background y = 8 mm

Recommended sensing range for the best performance

- ① Black object, 6% remission factor
- ② Gray object, 18% remission factor
- ③ White object, 90% remission factor

**LIGHT SPOT SIZE**

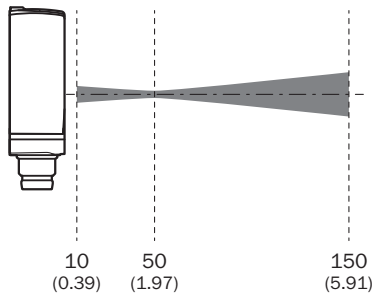
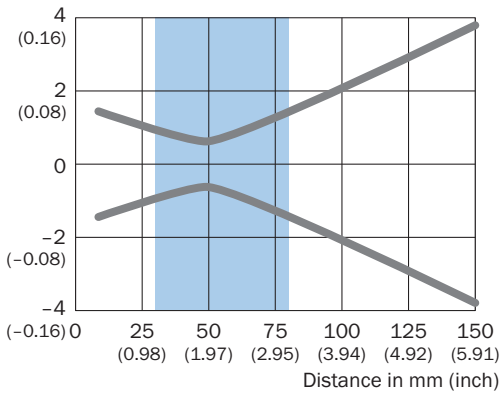
Dimensions in mm (inch)



Recommended sensing range for the best performance

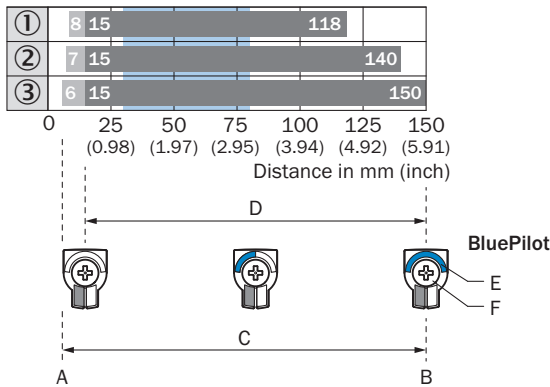
**LIGHT SPOT SIZE VERTICAL**

Dimensions in mm (inch)



Recommended sensing range for the best performance

**SENSING RANGE DIAGRAM**

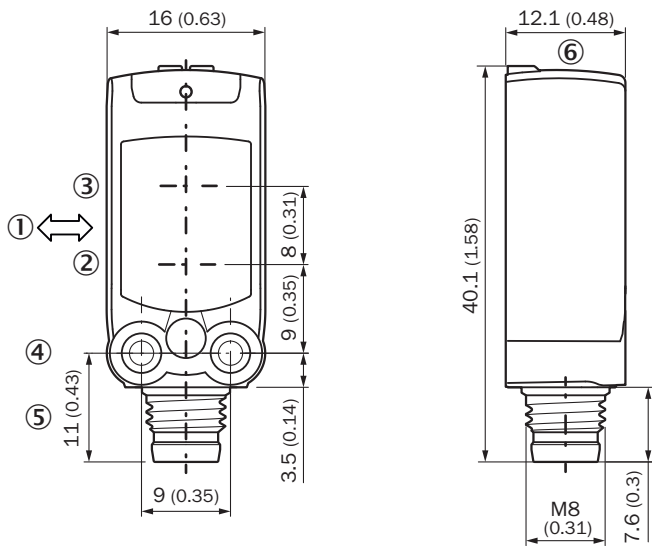


- A = Sensing range min. in mm
- B = Sensing range max. in mm
- C = Viewing range
- D = Adjustable switching threshold for background suppression
- E = Sensing range indicator
- F = Teach-Turn adjustment

Recommended sensing range for the best performance

- ① Black object, 6% remission factor
- ② Gray object, 18% remission factor
- ③ White object, 90% remission factor

**DIMENSIONAL DRAWING**



Dimensions in mm (inch)

- ① Standard direction of the material being detected
- ② Center of optical axis, sender
- ③ Center of optical axis, receiver
- ④ M3 mounting hole
- ⑤ Connection
- ⑥ display and adjustment elements

Further information as well as suitable accessories, example applications and downloads such as CAD dimensional models, operating instructions and software can be found at [www.sick.com/1150068](http://www.sick.com/1150068)



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SICK combines sensor intelligence with industry expertise and certified consulting services. We provide the ideal foundation for scalable as well as tailor-made automation solutions and create added value along the entire value chain. Our close partnerships with our customers are more than just a promise: Together, we optimize productivity, improve quality, protect health and safety, and help build a sustainable future. All with empathy and trust.

Since 1946, we have been developing innovative technologies with passion and a pioneering spirit. With a global network in around 40 countries, SICK has a global presence and is always close by. The company's headquarters are located in Waldkirch near Freiburg, Germany. Our customers benefit from our understanding of both local and global requirements, which enables us to deliver tailor-made solutions

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