

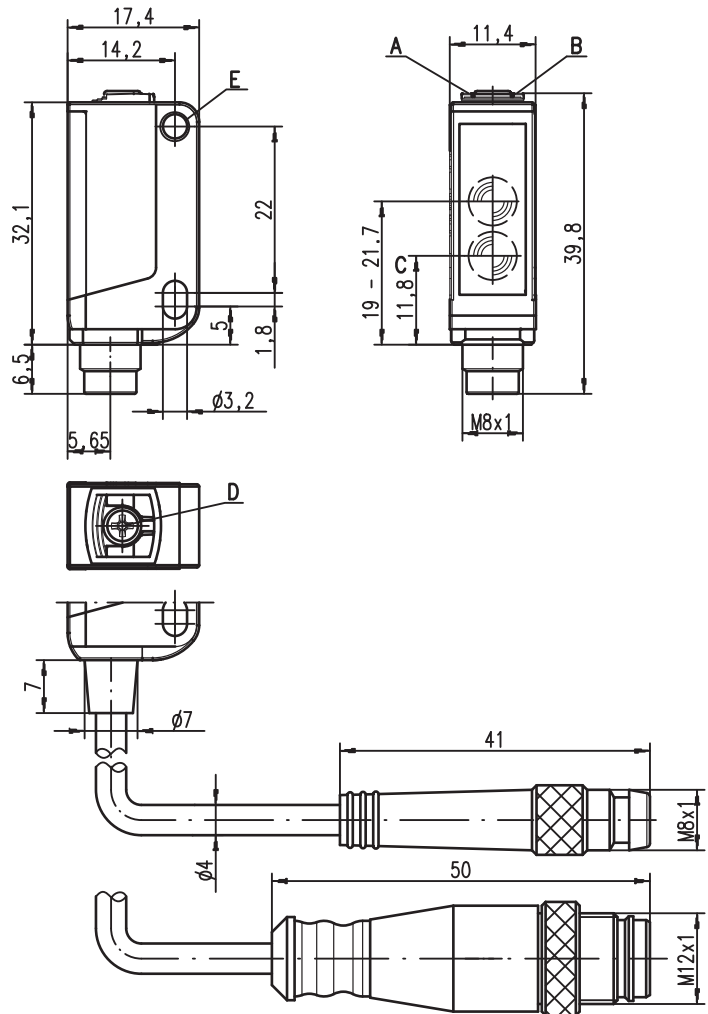
**HRT 3B**

**Diffuse reflection light scanner with background suppression**

Part No. 501 10702



**Dimensioned drawing**



- A** Green indicator diode
- B** Yellow indicator diode
- C** Optical axis
- D** 8-turn potentiometer for scanning range adjustment
- E** Attachment sleeve



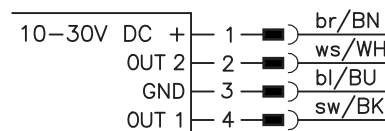
**5 ... 600mm**  
250mm with  
black-white error < 10%



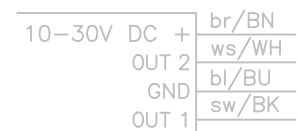
- Diffuse reflection light scanner with infrared light and adjustable background suppression
- Exact scanning range adjustment through 8-turn potentiometer
- Very good black/white behavior and reliable switching nearly independent of the object or background properties
- Small and compact construction with robust plastic housing, protection class IP 67/IP 69K for industrial application
- Fast alignment through *brightVision*®
- A²LS- Active Ambient Light Suppression
- Push-pull switching outputs
- High switching frequency for detection of fast events

**Electrical connection**

Plug connection, 4-pin



Cable, 4-wire



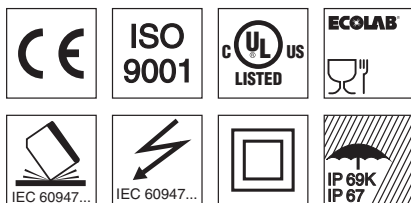
Plug connection, 3-pin



**Accessories:**

(available separately)

- Mounting systems (BT 3...)
- Cable with M8 or M12 connector (K-D ...)



We reserve the right to make changes • 3B\_D06gb.fm

## Specifications

### Optical data

Typ. scanning range limit <sup>1)</sup>	5 ... 600mm
Scanning range <sup>2)</sup>	see tables
Adjustment range <sup>1)</sup>	15 ... 600mm
Light beam characteristic	focussed at 200mm
Light source <sup>3)</sup>	LED (modulated light)
Wavelength	880nm (infrared)

### Timing

Switching frequency	1,000Hz
Response time	0.5ms
Delay before start-up	≤ 300ms (acc. to. IEC 60947-5-2)

### Electrical data

Operating voltage $U_B$ <sup>4)</sup>	10 ... 30VDC (incl. residual ripple)
Residual ripple	≤ 15% of $U_B$
Open-circuit current	≤ 15mA
Switching output	.../66 <sup>5)</sup> 2 push-pull switching outputs pin 2: PNP dark switching, NPN light switching pin 4: PNP light switching, NPN dark switching
	.../6 <sup>5)</sup> 1 push-pull switching output pin 4: PNP light switching, NPN dark switching
	.../6D <sup>5)</sup> 1 push-pull switching output pin 4: PNP dark switching, NPN light switching
	.../44 2 PNP switching outputs, complementary
	.../4 1 PNP switching output light switching, pin 2: not connected <sup>6)</sup>
	.../22 2 NPN switching outputs, complementary light/dark switching
Function characteristics	≥ ( $U_B - 2V$ ) / ≤ 2V
Signal voltage high/low	max. 100mA
Output current	adjustable via 8-turn potentiometer
Scanning range	

### Indicators

Green LED	ready
Yellow LED	object detected - reflection

### Mechanical data

Housing	plastic (PC-ABS); 1 attachment sleeve, nickel-plated steel
Optics cover	plastic (PMMA)
Weight	with connector: 10g with 200mm cable and connector: 20g with 2m cable: 50g
Connection type	2m cable (cross section 4x0.20mm <sup>2</sup> ), connector M8 metal, 0.2m cable with connector M8 or M12

### Environmental data

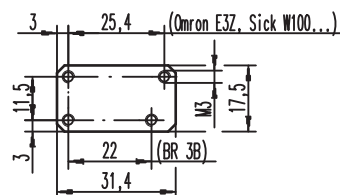
Ambient temp. (operation/storage)	-30°C ... +55°C / -30°C ... +70°C
Protective circuit <sup>7)</sup>	2, 3
VDE safety class	II for cable <sup>8)</sup> , III for metal plug
Protection class	IP 67, IP 69K
LED class	1 (acc. to EN 60825-1)
Standards applied	IEC 60947-5-2
Certifications	UL 508 <sup>4)</sup>

- 1) Typ. scan. range limit/adjustment range: max. achievable scanning range/adjustment range for light objects (white 90%)
- 2) Scanning range: recommended scanning range for objects with different diffuse reflection
- 3) Average life expectancy 100,000h at an ambient temperature of 25°C
- 4) For UL applications: for use in class 2 circuits according to NEC only
- 5) The push-pull switching outputs must not be connected in parallel
- 6) Pin 2: unassigned, hence especially suitable for the connection to AS-interface I/O coupling modules
- 7) 2=polarity reversal protection, 3=short-circuit protection for all transistor outputs
- 8) Rating voltage 50V

## Remarks

Adapter plate:

BT 3.2 (Part No. 501 03844) for alternate mounting on 25.4mm hole spacing (Omron E3Z, Sick W100...)



### ● Approved purpose:

The diffuse reflection light scanners are optical electronic sensors for optical, contactless detection of objects.

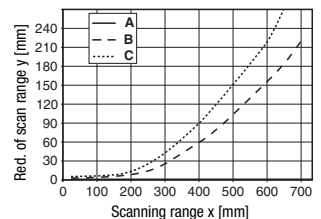
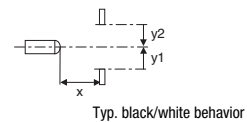
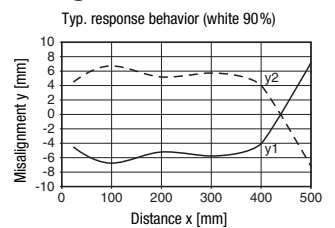
## Tables

1	5	600
2	10	500
3	15	400

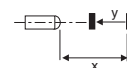
1	white 90%
2	grey 18%
3	black 6%

□ Scanning range [mm]

## Diagrams



- A white 90%
- B grey 18%
- C black 6%



## Remarks







Mounting system:



- ① = BT 3 (Part No. 500 60511)
- ②+③ = BT 3.1 <sup>1)</sup> (Part No. 501 05585)
- ①+②+③ = BT 3B (Part No. 501 05546)

1) Packaging unit: PU = 10 pcs.

**HRT 3B**
**Diffuse reflection light scanner with background suppression**
**Order guide**

Selection table		Order code →		HRT 3B/44 Part No. 501 10659				
Equipment ↓								
Output 1 (OUT 1)	push-pull switching output		light switching	<input type="radio"/>				
			dark switching	<input type="radio"/>				
	PNP transistor output		light switching	<input type="radio"/>	●			
			dark switching	<input type="radio"/>				
	NPN transistor output		light switching	<input type="radio"/>				
			dark switching	<input type="radio"/>				
Output 2 (OUT 2)	push-pull switching output		light switching	<input type="radio"/>				
			dark switching	<input type="radio"/>				
	PNP transistor output		light switching	<input type="radio"/>	●			
			dark switching	<input type="radio"/>				
	NPN transistor output		light switching	<input type="radio"/>				
			dark switching	<input type="radio"/>				
Connection	cable 2,000 mm		4-wire		●			
	cable 5,000 mm		4-wire					
	M8 connector, metal		3-pin					
	M8 connector, metal		4-pin					
	M8 connector, metal, snap-on		4-pin					
	200 mm cable with M8 connector		3-pin					
	200 mm cable with M8 connector		4-pin					
	200 mm cable with M12 connector		4-pin					
	pin 2: not assigned, suitable for connecting to AS-i coupling module							
Configuration	freely adjustable via 8-turn potentiometer				●			
	preset to scanning range [mm]:							
Switching frequency	200 Hz							
	1,000 Hz				●			

**Application notes**


- **Approved purpose:**  
The light scanners are optical electronic sensors for optical, contactless detection of objects.
- For glossy surfaces (e.g. metals), the light beam should not be incident on the object surface at a right angle. A slight inclination is sufficient for preventing undesired direct reflections. This may result in a reduction in the scanning range.
- Objects should only be moved laterally from the right or left. Moving in objects from the connector side or operating side is to be avoided.
- Outside of the scanning range, the sensor operates as an energetic diffuse reflection light scanner. Light objects can still be reliably detected up to the scanning range limit.
- The sensors are equipped with effective measures for the maximum avoidance of mutual interference should they be mounted opposite one another. Opposite mounting of multiple sensors of the same type should, however, absolutely be avoided.

