

**HRT 3B**

**Diffuse reflection light scanner with background suppression**

en 03-2011/04 50110702



**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 for industrial application
- A²LS- Active Ambient Light Suppression
- Push-pull switching outputs
- High switching frequency for detection of fast events

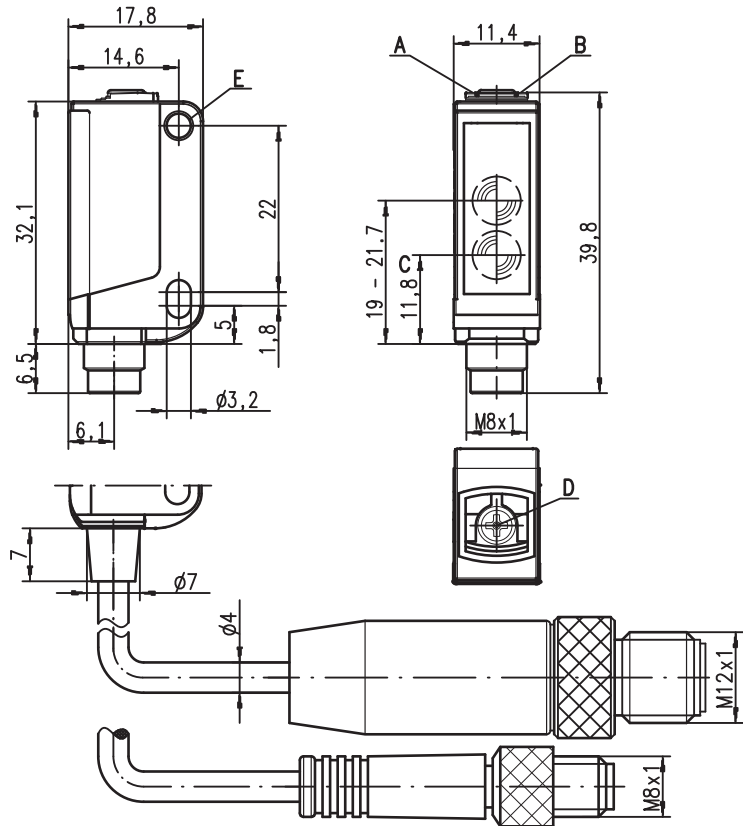


**Accessories:**

(available separately)

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

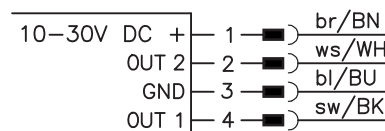
**Dimensioned drawing**



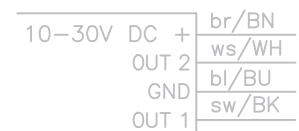
- A** Green indicator diode
- B** Yellow indicator diode
- C** Optical axis
- D** 8-turn potentiometer for scanning range adjustment
- E** Attachment sleeve

**Electrical connection**

Plug connection, 4-pin



Cable, 4-wire



Plug connection, 3-pin



We reserve the right to make changes • DS\_HRT3B\_en.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<sub>B</sub> <sup>4)</sup> 10 ... 30VDC (incl. residual ripple)  
 Residual ripple ≤ 15% of U<sub>B</sub>  
 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 NPN switching output light switching, pin 2: not connected <sup>6)</sup>  
 .../22 2 NPN switching outputs, complementary  
 light/dark switching  
 ≥ (U<sub>B</sub>-2V) ≤ 2V  
 max. 100mA  
 adjustable via 8-turn potentiometer

Function characteristics  
 Signal voltage high/low  
 Output current  
 Scanning range

Indicators

Green LED ready  
 Yellow LED object detected - reflection

Mechanical data

Housing <sup>7)</sup> 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  
 2m cable (cross section 4x0.20mm<sup>2</sup>),  
 connector M8 metal,  
 0.2m cable with connector M8 or M12

Connection type

Environmental data

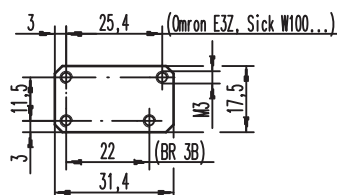
Ambient temp. (operation/storage) -30°C ... +55°C/-30°C ... +70°C  
 Protective circuit <sup>8)</sup> 2, 3  
 VDE safety class III  
 Protection class IP 67  
 Light source free group (in accordance with EN 62471)  
 Standards applied IEC 60947-5-2  
 Certifications UL 508 <sup>4)</sup>

- 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) Patent Pending Publ. No. US 7,476,848 B2
- 8) 2=polarity reversal protection, 3=short-circuit protection for all transistor outputs

Remarks

Adapter plate:

BT 3.2 (part no. 50103844) for alternate mounting on 25.4 mm hole spacing (Omron E3Z, Sick W100...)



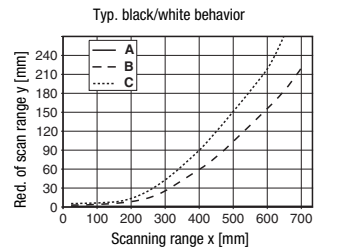
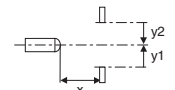
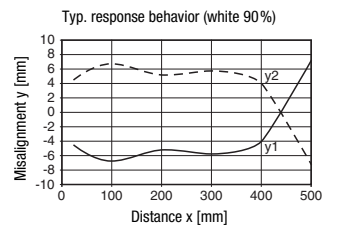
Tables

1	5	600
2	10	500
3	15	400

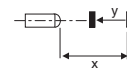
1	white 90%
2	grey 18%
3	black 6%

Scanning range [mm]

Diagrams



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



Remarks













Mounting system:



- ① = BT 3 (part no. 50060511)
- ②+③ = BT 3.1 <sup>1)</sup> (part no. 50105585)
- ①+②+③ = BT 3B (part no. 50105546)

1)Packaging unit: PU = 10 pcs.

**HRT 3B**
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**Order guide**

Selection table		Order code →		HRT 3B/44 Part No. 50110659				
<b>Equipment ↓</b>								
Output 1 (OUT 1)	push-pull switching output		light switching	○				
			dark switching	●				
	PNP transistor output		light switching	○	●			
			dark switching	●				
	NPN transistor output		light switching	○				
			dark switching	●				
Output 2 (OUT 2)	push-pull switching output		light switching	○				
			dark switching	●				
	PNP transistor output		light switching	○				
			dark switching	●	●			
	NPN transistor output		light switching	○				
			dark switching	●				
Connection	cable 2,000mm		4-wire		●			
	cable 5,000mm		4-wire					
	M8 connector, metal		3-pin					
	M8 connector, metal		4-pin					
	M8 connector, metal, snap-on		4-pin					
	200mm cable with M8 connector		3-pin					
	200mm cable with M8 connector		4-pin					
	200mm 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	200Hz							
	1,000Hz				●			

**Application notes**


- **Approved purpose:**  
This product may only be used by qualified personnel and must only be used for the approved purpose. This sensor is not a safety sensor and is not to be used for the protection of persons..
- 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 in 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.

