

**HRTR 53 "XL"**

**Diffuse reflection light scanner with background suppression**

en 04-2010/01 50107835-01



**5 ... 100mm**  
60mm with  
black-white error < 10%



- Diffuse reflection light scanner with visible red light and adjustable background suppression
- 316L stainless steel housing in Hygiene-Design
- Enclosed optics design prevents bacterial carry-overs
- ECOLAB and CleanProof+ tested
- Paperless device identification
- Scratch resistant and non-diffusive plastic front cover
- Wide, rectangular light spot guarantees the reliable detection of:
  - objects with openings, holes and grooves
  - transparent foils and bottles
  - objects with grid structures (e.g. blister packs)
  - objects with variable position
- A²LS- Active Ambient Light Suppression
- Push-pull switching outputs
- High switching frequency for detection of fast events

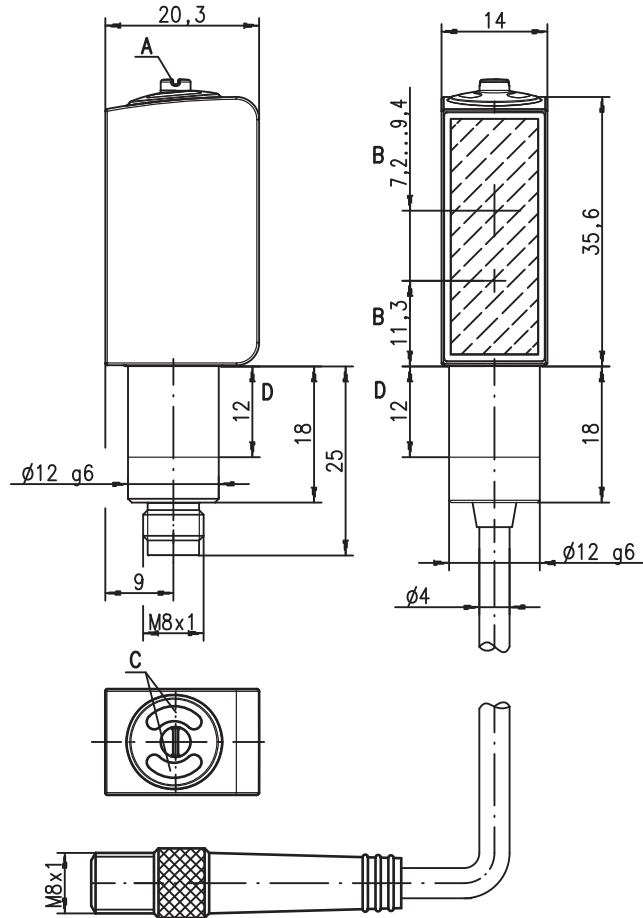


**Accessories:**

(available separately)

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

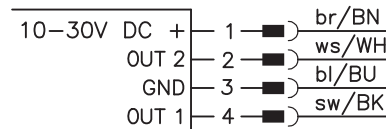
**Dimensioned drawing**



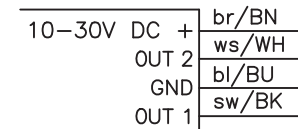
- A** Adjustment screw
- B** Optical axis
- C** Indicator diode
- D** Permissible clamping range

**Electrical connection**

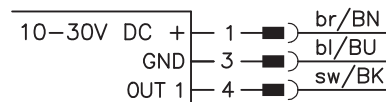
Plug connection, 4-pin (with/without cable)



Cable, 4 wires



Plug connection, 3-pin



We reserve the right to make changes • DS\_HRTR53\_XL\_en.fm

**Specifications**

**Optical data**

Typ. scanning range limit <sup>1)</sup> 5 ... 100mm  
 Scanning range <sup>2)</sup> see tables  
 Adjustment range 20 ... 100mm  
 Light spot approx. 3 x 40mm<sup>2</sup> at 50mm  
 Light source <sup>3)</sup> LED (modulated light)  
 Wavelength 620nm (visible red light)

**Timing**

Switching frequency 1000Hz  
 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  
 light/dark switching  
 Signal voltage high/low ≥ ( $U_B - 2V$ ) / ≤ 2V  
 Output current max. 100mA  
 Scanning range adjustable via 8-turn potentiometer

**Indicators**

Green LED ready  
 Yellow LED object detected - reflection

**Mechanical data**

Housing AISI 316L stainless steel, DIN X2CrNiMo17132, W.No1.4404  
 Housing design HYGIENE-Design  
 Housing roughness <sup>6)</sup>  $R_a \leq 2.5$   
 Connector AISI 316L stainless steel, DIN X2CrNiMo17132, W.No1.4404  
 Optics cover coated plastic (PMMA), scratch resistant and non-diffusive  
 Operation plastic (TPV - PE), non-diffusive  
 Weight with M8 connector: 50g  
 with 200mm cable and M8 connector: 60g  
 Connection type M8 connector, 4-pin or 3-pin  
 0.2m cable with M8 connector, 4-pin  
 via fit (see "Remarks")  
 Fastening 3 Nm (permissible range, see dimensioned drawing)  
 Max. tightening torque

**Environmental data**

Ambient temp. (operation/storage) <sup>7)</sup> -30°C ... +70°C / -30°C ... +70°C  
 Protective circuit <sup>8)</sup> 2, 3  
 VDE safety class <sup>9)</sup> III  
 Protection class IP 67, IP 69K <sup>10)</sup>  
 Environmentally tested acc. to ECOLAB, CleanProof+  
 LED class 1 (acc. to EN 60825-1)  
 Standards applied IEC 60947-5-2  
 Certifications UL 508 <sup>4)</sup>  
 Chemical resistance tested in accordance with ECOLAB and CleanProof+  
 (see remarks)

1) Typ. scan. range limit: max. achievable scanning 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) Typical value for the stainless steel housing  
 7) Operating temperatures of +70°C permissible only briefly (≤ 15min)  
 8) 2=polarity reversal protection, 3=short-circuit protection for all transistor outputs  
 9) Rating voltage 50V  
 10) Only with internal tube mounting of the M8 connector

**Approved purpose**

The photoelectric sensors are optical electronic sensors for optical, contactless detection of objects.

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.

**Tables**

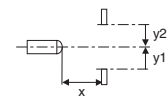
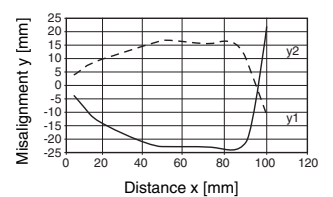
1	5	100
2	5	90
3	5	80

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

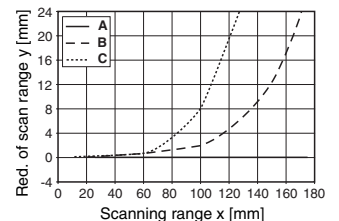
Scanning range [mm]  
 Typ. scanning range limit [mm]

**Diagrams**

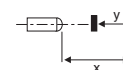
Typ. response behavior (white 90%)



Typ. black/white behavior



A white 90%  
 B gray 18%  
 C black 6%



**Remarks**

A list of tested chemicals can be found in the first part of the product description.

Only secure in designated area using set screw. Max. tightening torque 3Nm.

**HRTR 53 "XL"**
**Diffuse reflection light scanner with background suppression**
**Order guide**

Selection table		Order code →			
Equipment ↓		HRTR 53/66-XL-S8 Part No. 50107507	HRTR 53/6-XL-S8.3 Part No. 50107508	HRTR 53/66-XL-200-S8 Part No. 50107509	HRTR 53/66-XL Part No. 50108372
Switching output	2 x Push-pull switching output	●		●	●
	1 x Push-pull switching output		●		
Switching function	1 PNP light switching and NPN dark switching output	●	●	●	●
	1 PNP dark switching and NPN light switching output	●		●	●
Connection	M8 connector, metal, 4-pin	●			
	M8 connector, metal, 3-pin		●		
	cable 200mm with M 8 connector, 4-pin			●	
	2000mm cable, 4-wire				●
Indicators	green LED: ready	●	●	●	●
	yellow LED: switching output	●	●	●	●

**Application notes**


- 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 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.

