

HRTL 46B Ex n

Laser diffuse reflection sensor with background suppression

2026/02/04 50123270-05



50 ... 1,200mm
800mm with
black-white error < 10%

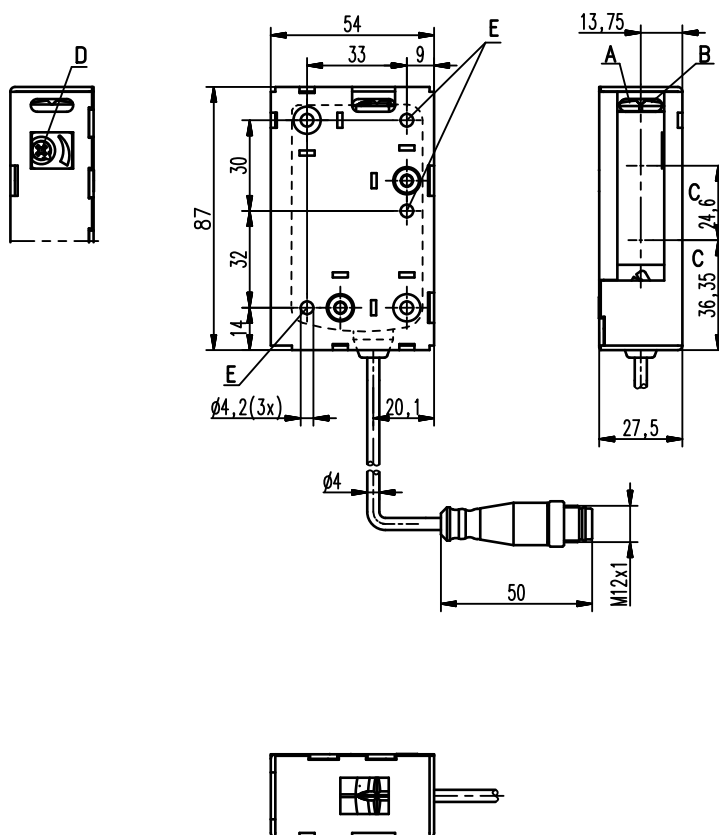
- Adjustable sensor with background suppression
- Exact positioning and detection of small parts by means of a laser beam
- Exact range adjustment through multiturn potentiometer
- Fast alignment through *brightVision*[®]
- High switching frequency for detection of fast events
- A²LS - Active ambient light suppression
- Complementary switching outputs for optimal adaptation to the application
- Activation for e.g. muting or test function
- ATEX certification:
 - Ex II 3G Ex ec IIB T4 Gc X
 - Ex II 3D Ex tc IIIC T70°C Dc X
- IECEx BVS 21.0077X
 - Ex ec IIB T4 Gc
 - Ex tc IIIC T70°C Dc
- UL approval is available for the sensor used without an enclosure

Accessories:

(available separately)

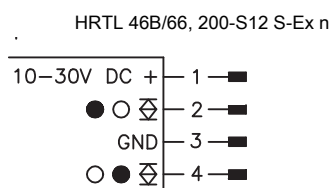
- Mounting systems (BT 46, BT 46.1, BT 46.1.5, BT 46.2)
- M12 connectors (KD ...)
- Ready-made cables (KD ...)
- Interlocking guard K-VM12-Ex (Part no. 501 09217)

Dimensioned drawing



- A** Green indicator diode
- B** Yellow indicator diode
- C** Optical axis
- D** Range adjustment
- E** Fastening hole

Electrical connection



We reserve the right to make changes

Technical data

Optical data

Typ. maximum range (white 90%) ¹⁾	Red light 50 ... 1,200mm
Operating range ²⁾	See tables
Adjustment range	120 ... 1,200mm
Light source	Laser (modulated light)
Laser class	1 (acc. to IEC 60825-1:2014)
Wavelength	655 nm (visible red light)
Light spot	Approx. 3 mm x 5 mm at 1,000 m
Max. output power	2.2mW
Pulse duration	13.8 µs

Time behavior

Switching frequency	1,000Hz
Response time	0.5ms
Readiness delay	≤ 100ms

Electrical data

Operating voltage U_B	10 ... 30VDC (incl. residual ripple)
Residual ripple	≤ 15% of U_B
Open-circuit current	≤ 30mA
Switching output	.../66. ... 2 push-pull switching outputs ³⁾ Pin 2: PNP dark switching, NPN light switching Pin 4: PNP light switching, NPN dark switching .../6. ... Push-pull switching output ⁴⁾ Pin 4: PNP light switching, NPN dark switching
Signal voltage high/low	≥ ($U_B - 2V$) / ≤ 2V
Output current	Max. 50mA

Indicators

Green LED	Ready
Yellow LED	Reflection
Yellow LED, flashing	Reflection, no function reserve

Mechanical data

Housing	Plastic
Optics cover	Plastic
Weight	50g (with connector) / 65g (with cable and conn.)
Connection type	M12 connector or cable with M12 connector, cable length: 200mm

Environmental data

Ambient temp. (operation/storage)	-20°C ... + 50°C / -30°C ... +70°C
Protective circuit ⁴⁾	2, 3
VDE protection class ⁵⁾	II, all-insulated
Degree of protection	IP 67, IP 69K
Standards applied	IEC 60947-5-2

Explosion protection

Certification ATEX:	Ex II 3G Ex ec IIB T4 Gc X
Certification IECEx:	Ex II 3D Ex tc IIIC T70°C Dc X Ex ec IIB T4 Gc Ex tc IIIC T70°C Dc

Additional functions

Activation input active	
Transmitter active/not active	≥ 8V / ≤ 2V
Activation/disable delay	≤ 1 ms / ≤ 2 ms
Input resistance	10kΩ ± 10%

- 1) Typ. max. range: max. achievable range for light objects (white 90%)
- 2) Operating range: recommended range for objects with different diffuse reflection
- 3) The push-pull switching outputs must not be connected in parallel
- 4) 2=polarity reversal protection, 3=short circuit protection for all outputs
- 5) Rating voltage 50V

Order guide

The sensors listed here are preferred types; current information at www.leuze.com.

Cable with M12 connector, length: 200mm	Designation	Part no.
Antivalent push-pull switching output		
Housing model S (standard)	HRTL 46B/66, 200-S12 S-Ex n	50114409

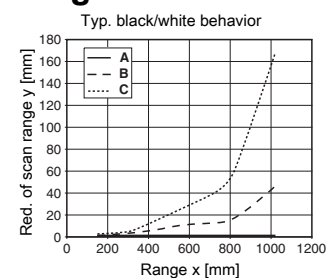
Tables

1	50	1,200
2	60	850
3	80	750

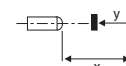
1	White 90%
2	Gray 18%
3	Black 6%

Operating range [mm]

Diagrams



- A White 90%
- B Gray 18%
- C Black 6%



Notes

Observe intended use!

- ⚠ This product is not a safety sensor and is not intended as personnel protection.
- ⚠ The product may only be put into operation by competent persons.
- ⚠ Only use the product in accordance with its intended use.

- With the set detection range, a tolerance of the upper scanning range limit is possible depending on the reflection properties of the material surface.

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Laser safety notices

ATTENTION, LASER RADIATION – CLASS 1 LASER PRODUCT



The device satisfies the requirements of IEC/EN 60825-1:2014 safety regulations for a product of **laser class 1** and complies with 21 CFR 1040.10 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.

- ⚡ Observe the applicable statutory and local laser protection regulations.
- ⚡ The device must not be tampered with and must not be changed in any way.


There are no user-serviceable parts inside the device.

Repairs must only be performed by Leuze electronic GmbH + Co. KG.

Notices for the safe use of sensors in potentially explosive areas

This document is valid for devices with the following classifications according to the ATEX certification:

Device group	Device category	Equipment protection level	Zone
II	3G	Gc	Zone 2
II	3D	Dc	Zone 22

⚠ ATTENTION!	
	<ul style="list-style-type: none"> ● Check whether the equipment classification corresponds to the requirements of the application. ● The devices are not suited for the protection of persons and may not be used for emergency shutdown purposes. ● A safe operation is only possible if the equipment is used properly and for its intended purpose. ● Electrical equipment may endanger humans and (where applicable) animal health, and may threaten the safety of goods if used incorrectly or under unfavorable conditions in potentially explosive areas. ● The applicable national regulations (e.g. EN 60079-14) for the configuration and installation of explosion-proof systems must be observed without fail.

Installation and Commissioning (see also Special conditions)

- The devices must only be installed and commissioned by trained electricians. They must be aware of the regulations and operation of explosion-proof equipment.
- The connector of series 46B sensors must be equipped with a safeguard or a mechanical interlocking guard (e.g. K-VM 12-Ex, part no. 50109217) to prevent unintentional separation under voltage. An additional warning sign "WARNING – DO NOT SEPARATE WHEN ENERGIZED" that is supplied with the device must be attached to the sensor or its mounting bracket so that it is clearly visible. This notice must be attached to the device before it is taken into operation.
- Connection cables and connectors must be protected from excessive or unintended pulling or pushing strain.
- Prevent dust deposits from forming on the devices.

Maintenance

- No changes may be made to explosion-proof devices.
- Repairs may only be performed by a person trained for such work or by the manufacturer.
- Defective devices must be replaced immediately.
- Cyclical maintenance is generally not necessary.
- Depending on the environmental conditions, it may occasionally be necessary to clean the optical surfaces of the sensors. This cleaning must only be performed by persons trained for performing this task. We recommend the use of a soft and damp cloth. Cleaning agents containing solvents must not be used.

Chemical resistance

- The sensors demonstrate good resistance against diluted (weak) acids and bases.
- Exposure to organic solvents is possible only under certain circumstances and only for short periods of time.
- Resistance to chemicals must be examined on a case by case basis.

Special conditions

- The devices must be installed in such a way that they are protected from direct exposure to UV rays (sunlight).
- The metallic cage has to be integrated into the potential equalization before usage to prevent electrostatic charge.
- The light barriers must not be installed in areas where processes with high static charges occur.
- The light barriers may only be used if high or repeated electrostatic processes are surely excluded by installation.
- The metallic cage is screwed together with two torx-screws.
- The connector of series 46B sensors must be equipped with a safeguard or a mechanical interlocking guard to prevent unintentional separation under voltage.
- The connector provided by the user in the final application shall be in accordance with all applicable clauses of IEC 60079-0, IEC 60079-7 and IEC 60079-31. A minimum of IP54 according to IEC 60529 shall be ensured.