HRT 46B Ex n

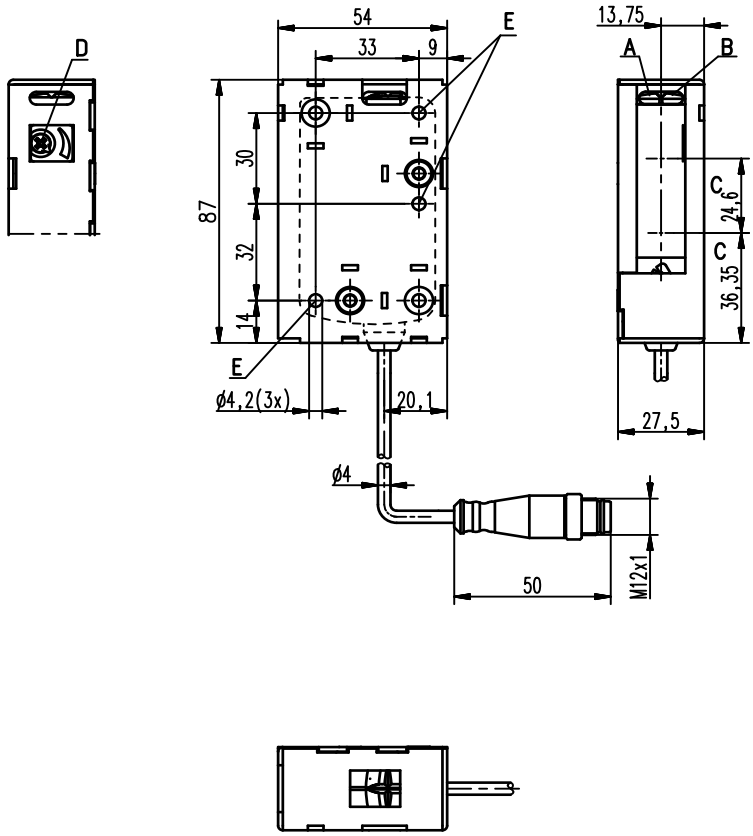
Diffuse reflection sensor with background suppression

en 2020/08/20 50109199-05

0 … 2,500 mm
1200 mm with black-white error < 10 %

- Adjustable sensor with background suppression
- Reliable detection of light and dark, as well as inclined or sloped surfaces
- Exact range adjustment through multiturn potentiometer.
- Complementary switching outputs for optimal adaptation to the application
- Warning output - For increased availability
- A²LS - Active ambient light suppression
- Ⓔx II 3G Ex nA op is IIB T4 Gc X
- Ⓔx II 3D Ex tc IIIC T90°C Dc IP67 X

Dimensioned drawing



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

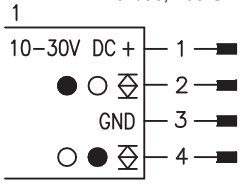
Accessories:

(available separately)

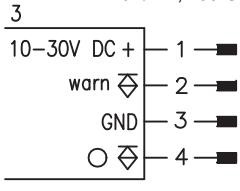
- Mounting systems (BT 46, BT 46.1, BT 46.1.5, BT 46.2)
- M12 connectors (KD …)
- Ready-made cables (KD …)
- Interlocking guard K-VM12-Ex (part no. 501 09217)

Electrical connection

HRT 46B/66, 200-S12 S-Ex n



IHRT 46B/4…, 200-S12 S-Ex n



Technical data

Optical data		
Typ. range limit (white 90%) [1]		Infrared light 0 … 2,500mm
Operating range [2]		See tables
Adjustment range		120 … 2500mm
Light source [3]		LED (modulated light)
Wavelength		850 nm
Time behavior		
Switching frequency		200Hz
Response time		2.5ms
Readiness delay		≤ 100ms
Electrical data		
With transistor switching outputs		
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 [4] Pin 2: PNP dark switching, NPN light switching Pin 4: PNP light switching, NPN dark switching
	…/44. …	2 PNP switching outputs pin 2: PNP dark switching, pin 4: PNP light switching
	…/4. …	PNP switching output, pin 4: PNP light switching
	…/4D. …	PNP switching output, pin 4: PNP dark switching
Signal voltage high/low		≥ (U_B-2V)/≤ 2V
Output current		Max. 100mA
With relay switching output		
Operating voltage U_B [4]		24VDC ± 10%
Open-circuit current		≤ 40mA
Switching output	…/7. …	Relay, make-contact between pin 2 and pin 4, light switching [5]
Switching voltage		30VAC/DC, max. 200mA
Switching power		Max. 6VA, cos φ = 1
Indicators		
Green LED		Ready
Yellow LED		Reflection
Yellow LED, flashing		Reflection, no function reserve
Mechanical data		
Housing [6] / lens cover		Plastic / plastic
Weight		50g (with connector) / 65g (with cable and conn.)
Connection type		Cable with M12 connector, cable length: 200mm
Environmental data		
Ambient temp. (operation/storage)		-30°C … +60°C/-30°C … +60°C
Protective circuit [7]		2, 3
VDE protection class [8]		II, all-insulated
Degree of protection		IP 67, IP 69K
Light source		Exempt group (in acc. with EN 62471)
Standards applied		IEC 60947-5-2
Explosion protection		
Certification (CENELEC)		⟨Ex⟩ II 3G Ex nA op is IIB T4 Gc X ⟨Ex⟩ II 3D Ex tc IIIC T90°C Dc IP67 X
Additional functions		
Warning output autoControl warn		PNP transistor, counting principle
Signal voltage high/low		≥ (U_B-2V)/≤ 2V
Output current		Max. 100mA

1) Typ. range limit: max. achievable range for light objects (white 90%)
2) Operating range: recommended range for objects with different diffuse reflection
3) Average life expectancy 100,000 h at an ambient temperature of 25°C
4) The push-pull switching outputs must not be connected in parallel
5) Suitable spark extinction must be provided with inductive or capacitive loads
6) Model "S"=standard housing, model "W"= with lateral flange
7) 2=polarity reversal protection, 3=short circuit protection for all outputs
8) Rating voltage 50VAC

Order guide

Connection diagram no.		Designation	Part no.
Cable with M12 connector, length: 200mm			
Antivalent push-pull switching output			
Housing model S (standard)	1	HRT 46B/66, 200-S12 S-Ex n	50108587
PNP switching output light switching, warning output			
Housing model S (standard)	3	IHRT 46B/4, 200-S12 S-Ex n	50108943
PNP switching output light switching, warning output + operating range adjustment			
Housing model S (standard)	3	IHRT 46B/4.01, 200-S12 S-Ex n	50112802

Tables

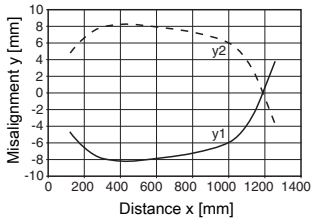
1	0	2,500
2	5	1,800
3	10	1,200

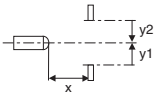
1	White 90%
2	gray 18%
3	Black 6%

Operating range [mm]

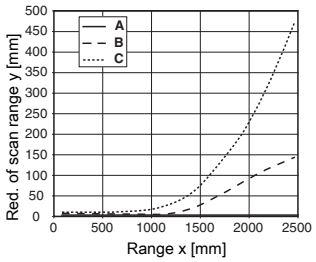
Diagrams

Typ. response behavior (white 90%)

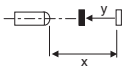




Typ. black-and-white behavior



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.

Ex devices

Notices for the safe use of sensors in potentially explosive areas

This document is valid for devices with the following classifications:

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

⚠ ATTENTION!

- 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

- The devices must only be installed and commissioned by trained electricians. They must be aware of the regulations and operation of explosion-proof equipment.
- To prevent unintentional separation under voltage, devices with connector (e.g. Series 46B) must be equipped with a safeguard or a mechanical interlocking guard (e.g. K-VM12-Ex, part no. 50109217). The warning sign "Do not disconnect under voltage" that is supplied with the device must be attached to the sensor or its mounting bracket so that it is clearly visible.
- Devices with terminal compartment lid (e.g. Series 96) must only be commissioned if the terminal compartment lid of the device is properly sealed.
- Connection cables and connectors must be protected from excessive or unintended pulling or pushing strain.
- Prevent dust deposits from forming on the devices.
- Metallic parts (e.g. housing, mounting devices) are to be integrated into the potential equalization to prevent electrostatic charge.

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).
- Static charge on plastic surfaces must be avoided.