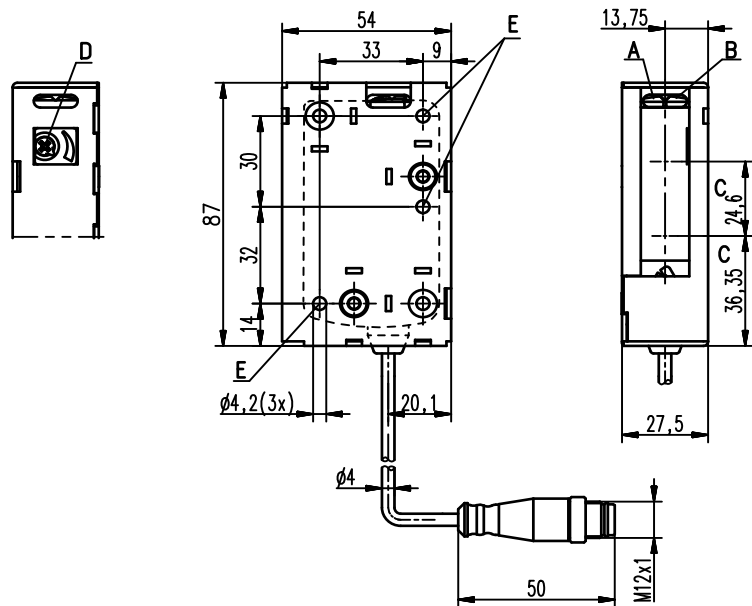


## HRT 46B Ex n

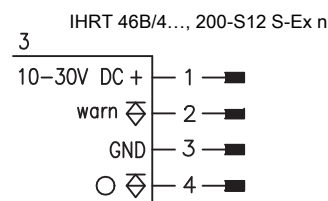
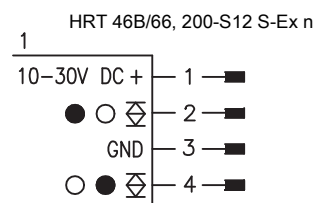
## Diffuse reflection sensor with background suppression

### Dimensioned drawing



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

### Electrical connection



0 ... 2,500mm  
1200mm 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
- A<sup>2</sup>LS - Active ambient light suppression
- 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

### 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)

### Technical data

#### Optical data

|  |                       |
|--|-----------------------|
| Typ. maximum range (white 90%) <sup>1)</sup> | Infrared light        |
| Operating range <sup>2)</sup>                | 0 ... 2,500mm         |
| Adjustment range                             | See tables            |
| Light source <sup>3)</sup>                   | 120 ... 2500mm        |
| Wavelength                                   | LED (modulated light) |
|  | 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        | 2 push-pull switching outputs <sup>4)</sup>      |
|                         | Pin 2: PNP dark switching, NPN light switching   |
|                         | Pin 4: PNP light switching, NPN dark switching   |
|                         | PNP switching output, pin 4: PNP light 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 / 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)  | -20°C ... +50°C/-30°C ... +70°C      |
| Protective circuit <sup>5)</sup>   | 2, 3                                 |
| VDE protection class <sup>6)</sup> | 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 ATEX:  | <div> <div>Ex</div> <div>II 3G Ex ec IIB T4 Gc X</div> </div>     |
| Certification IECEx: | <div> <div>Ex</div> <div>II 3D Ex tc IIIC T70°C Dc X</div> </div> |
|                      | Ex ec IIB T4 Gc   |
|                      | Ex tc IIIC T70°C Dc   |

#### Additional functions

|                                 |                                    |
|---------------------------------|------------------------------------|
| Warning output autoControl warn | PNP transistor, counting principle |
| Signal voltage high/low         | ≥ ( $U_B - 2V$ ) ≤ 2V              |
| Output current                  | Max. 50mA                          |

- 1) Typ. max. range: 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) 2=polarity reversal protection, 3=short circuit protection for all outputs
- 6) Rating voltage 50VAC

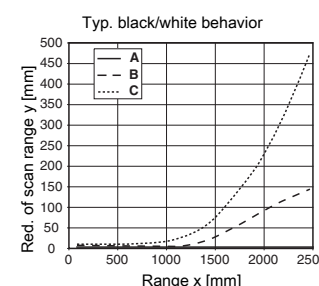
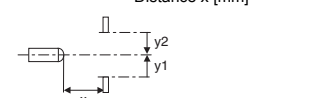
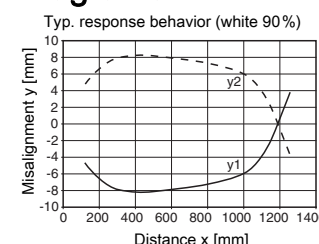
### Tables

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

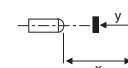
|   |           |
|---|-----------|
| 1 | White 90% |
| 2 | Gray 18%  |
| 3 | Black 6%  |

☐ Operating range [mm]

### Diagrams



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



### Notes

| Observe intended use!   |
|---|
| <ul style="list-style-type: none"> <li>This product is not a safety sensor and is not intended as personnel protection.</li> <li>The product may only be put into operation by competent persons.</li> <li>Only use the product in accordance with its intended use.</li> </ul> |

### 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 |
|----------------------------|---|-------------------------------|----------|

- 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 (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.