

## Technical data sheet

### Diffuse sensor with background suppression set

Part no.: 50143114

SET HT46C/4P-M12+BTU300M-D12



For illustration purposes only

#### Contents

- Set consists of
- Technical data
- Dimensioned drawings
- Electrical connection
- Diagrams
- Operation and display
- Part number code
- Notes
- Further information
- Accessories



## Set consists of

|                                                                                   | Quantity | Part no. | Designation  | Article                                    | Description                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------------------------|----------|----------|--------------|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 1        | 50117252 | BTU 300M-D12 | Mounting system                            | Design of mounting device: Mounting system<br>Fastening, at system: For 12 mm rod, Sheet-metal mounting<br>Mounting bracket, at device: Screw type, Suited for M4 screws<br>Type of mounting device: Clampable, Adjustable, Turning, 360°<br>Material: Metal                                                                                                                |
|                                                                                   | 1        | 50127048 | HT46C/4P-M12 | Diffuse sensor with background suppression | Operating range limit: 0.005 ... 3 m<br>Light source: LED, Red<br>Supply voltage: DC<br>Digital switching outputs: 2 Piece(s)<br>Switching output 1: Transistor, PNP, Light switching<br>Switching output 2: Transistor, PNP, Dark switching<br>Switching frequency: 250 Hz<br>Connection: Connector, M12, Plastic, 4 -pin<br>Operational controls: Multiturn potentiometer |

## Technical data

### Basic data

|                     |                                                          |
|---------------------|----------------------------------------------------------|
| Series              | 46C                                                      |
| Operating principle | Diffuse reflection principle with background suppression |
| Pre-mounted on      | Mounting system                                          |

### Special version

|                 |             |
|-----------------|-------------|
| Special version | Article set |
|-----------------|-------------|

### Optical data

|                             |                                      |
|-----------------------------|--------------------------------------|
| Black-white error           | < 10% up to 1200 mm                  |
| Operating range             | Guaranteed operating range           |
| Operating range, white 90%  | 0.005 ... 3 m                        |
| Operating range, gray 18%   | 0.02 ... 2 m                         |
| Operating range, black 6%   | 0.05 ... 1.5 m                       |
| Operating range limit       | 0.005 ... 3 m                        |
| Operating range limit       | Typical operating range              |
| Adjustment range            | 120 ... 3,000 mm                     |
| Beam path                   | Focused                              |
| Light source                | LED, Red                             |
| Wavelength                  | 630 nm                               |
| Transmitted-signal shape    | Pulsed                               |
| LED group                   | Exempt group (in acc. with EN 62471) |
| Type of light spot geometry | Rectangular                          |
| Focus                       | Fixed                                |

### Electrical data

|                    |                              |
|--------------------|------------------------------|
| Protective circuit | Polarity reversal protection |
|                    | Short circuit protected      |
|                    | Transient protection         |

### Performance data

|                      |                                        |
|----------------------|----------------------------------------|
| Supply voltage $U_B$ | 10 ... 30 V, DC, Incl. residual ripple |
| Residual ripple      | 0 ... 15 %, From $U_B$                 |
| Open-circuit current | 0 ... 30 mA                            |

### Outputs

|                                     |            |
|-------------------------------------|------------|
| Number of digital switching outputs | 2 Piece(s) |
|-------------------------------------|------------|

### Switching outputs

|                         |                          |
|-------------------------|--------------------------|
| Type                    | Digital switching output |
| Voltage type            | DC                       |
| Switching current, max. | 100 mA                   |
| Switching voltage       | high: $\geq (U_B - 2V)$  |
|                         | low: $\leq 2 V$          |

### Switching output 1

|                     |                     |
|---------------------|---------------------|
| Assignment          | Connection 1, pin 4 |
| Switching element   | Transistor, PNP     |
| Switching principle | Light switching     |

### Switching output 2

|                     |                     |
|---------------------|---------------------|
| Assignment          | Connection 1, pin 2 |
| Switching element   | Transistor, PNP     |
| Switching principle | Dark switching      |

### Time behavior

|                     |        |
|---------------------|--------|
| Switching frequency | 250 Hz |
| Response time       | 2 ms   |
| Readiness delay     | 300 ms |

### Connection

|                       |            |
|-----------------------|------------|
| Number of connections | 1 Piece(s) |
|-----------------------|------------|

### Connection 1

|                    |                |
|--------------------|----------------|
| Function           | Signal OUT     |
|                    | Voltage supply |
| Type of connection | Connector      |
| Thread size        | M12            |
| Type               | Male           |
| Material           | Plastic        |
| No. of pins        | 4 -pin         |
| Encoding           | A-coded        |

## Technical data

### Mechanical data

|                                                |                                                       |
|------------------------------------------------|-------------------------------------------------------|
| Dimension (W x H x L)                          | 20.5 mm x 76.3 mm x 44 mm                             |
| Housing material                               | Plastic                                               |
| Plastic housing                                | PC-PBT                                                |
| Lens cover material                            | Plastic / PMMA                                        |
| Net weight                                     | 60 g                                                  |
| Housing color                                  | Red                                                   |
| Type of fastening                              | Through-hole mounting<br>Via optional mounting device |
| Recommended tightening torque for M3 fastening | 0.9 N·m                                               |
| Recommended tightening torque for M4 fastening | 1.4 N·m                                               |
| Compatibility of materials                     | ECOLAB                                                |

### Operation and display

|                                     |                         |
|-------------------------------------|-------------------------|
| Type of display                     | LED                     |
| Number of LEDs                      | 2 Piece(s)              |
| Operational controls                | Multiturn potentiometer |
| Function of the operational control | Range adjustment        |

### Environmental data

|                                |               |
|--------------------------------|---------------|
| Ambient temperature, operation | -40 ... 60 °C |
| Ambient temperature, storage   | -40 ... 70 °C |

### Certifications

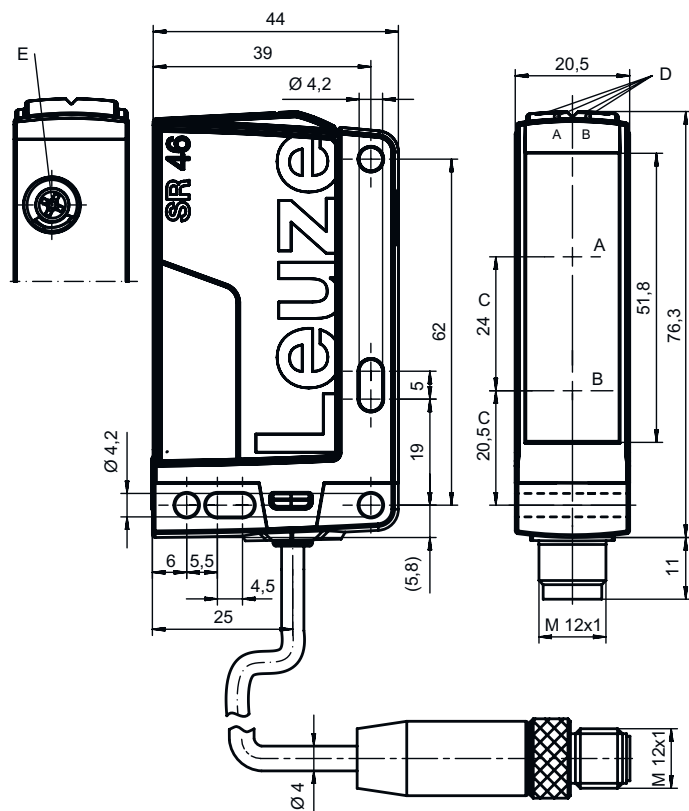
|                      |               |
|----------------------|---------------|
| Degree of protection | IP 67         |
|                      | IP 69K        |
| Protection class     | III           |
| Standards applied    | IEC 60947-5-2 |

### Classification

|                       |          |
|-----------------------|----------|
| Customs tariff number | 85365019 |
| ECLASS 5.1.4          | 27270904 |
| ECLASS 8.0            | 27270904 |
| ECLASS 9.0            | 27270904 |
| ECLASS 10.0           | 27270904 |
| ECLASS 11.0           | 27270904 |
| ECLASS 12.0           | 27270903 |
| ECLASS 13.0           | 27270903 |
| ECLASS 14.0           | 27270903 |
| ECLASS 15.0           | 27270903 |
| ETIM 5.0              | EC002719 |
| ETIM 6.0              | EC002719 |
| ETIM 7.0              | EC002719 |
| ETIM 8.0              | EC002719 |
| ETIM 9.0              | EC002719 |
| ETIM 10.0             | EC002719 |

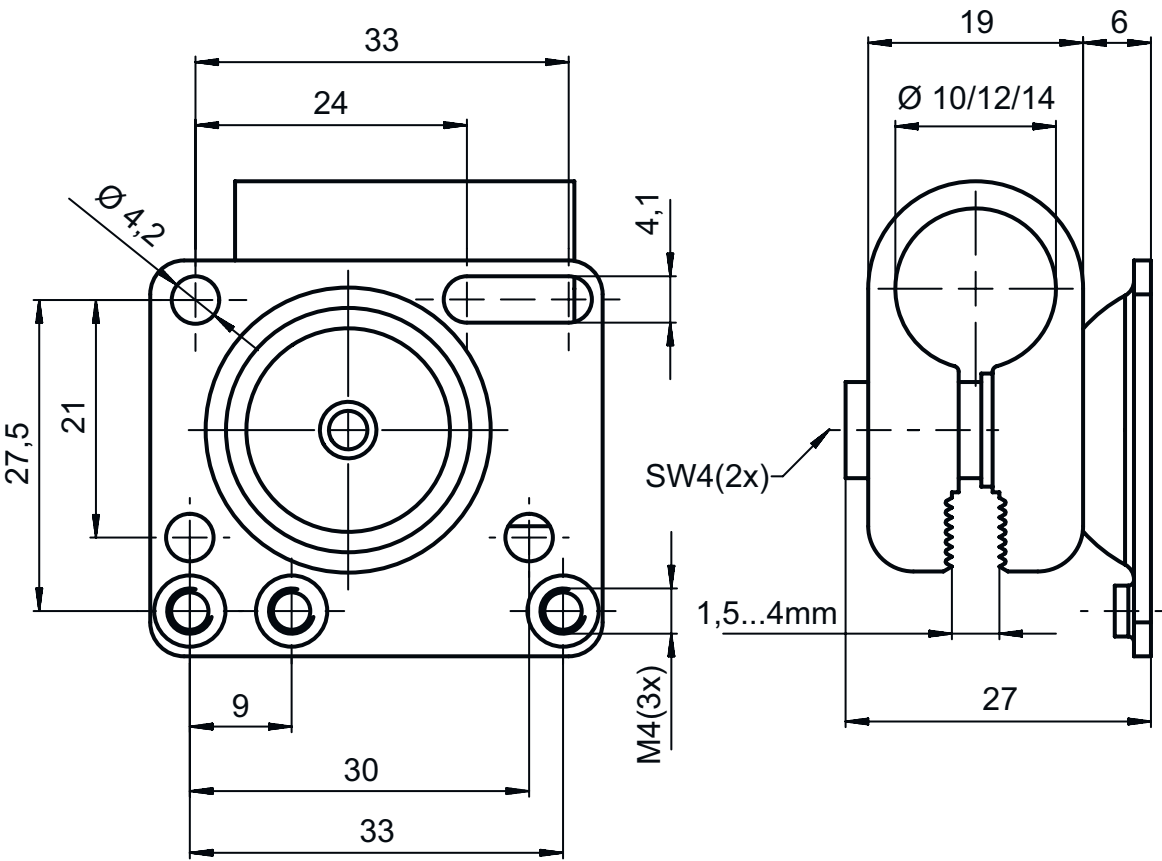
## Dimensioned drawings

All dimensions in millimeters



- A Receiver
- B Transmitter
- C Optical axis
- DA Green LED
- DB Yellow LED
- E Multiturn potentiometer

Dimensioned drawings



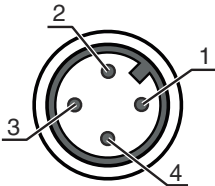
Electrical connection

Connection 1

|                    |                |
|--------------------|----------------|
| Function           | Signal OUT     |
|                    | Voltage supply |
| Type of connection | Connector      |
| Thread size        | M12            |
| Type               | Male           |
| Material           | Plastic        |
| No. of pins        | 4 -pin         |
| Encoding           | A-coded        |

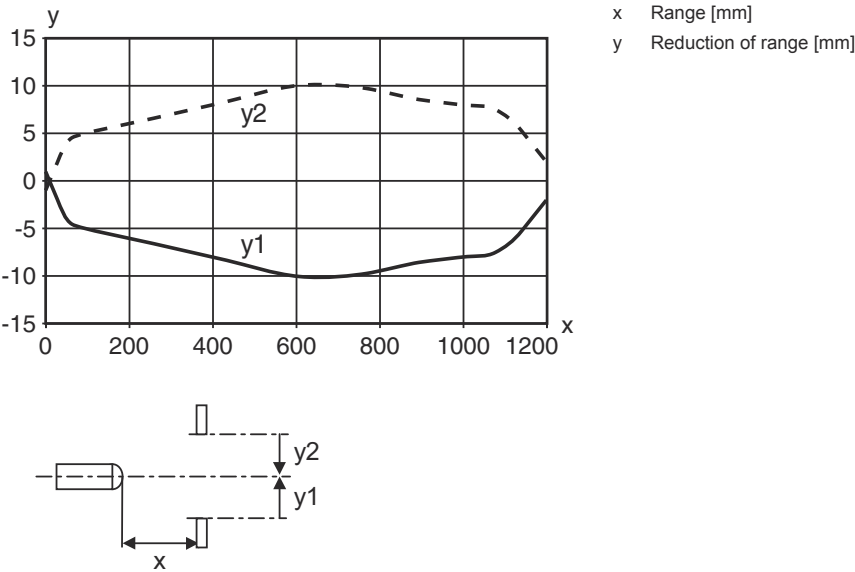
Pin Pin assignment

|   |       |
|---|-------|
| 1 | V+    |
| 2 | OUT 2 |
| 3 | GND   |
| 4 | OUT 1 |

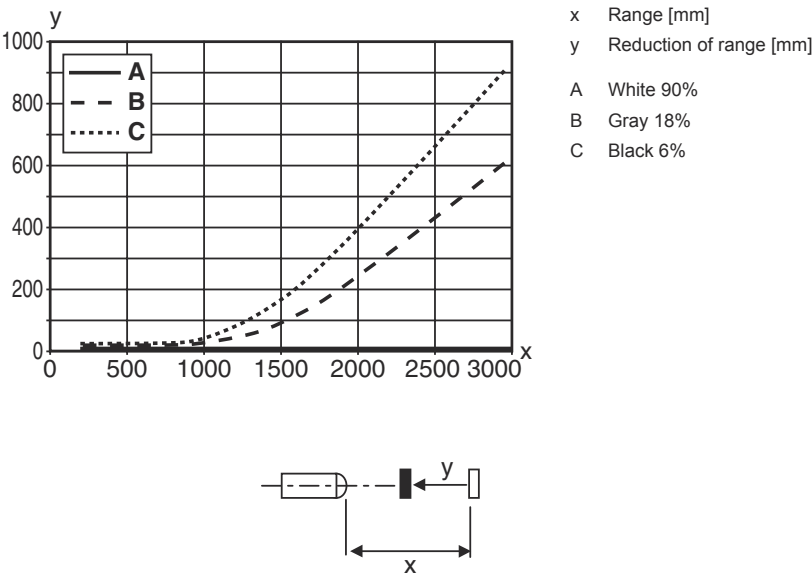


Diagrams

Typ. response behavior (white 90 %)



Typ. black/white behavior



Operation and display

| LED | Display                  | Meaning               |
|-----|--------------------------|-----------------------|
| 1   | Green, continuous light  | Operational readiness |
| 2   | Yellow, continuous light | Reflection            |

## Part number code

Part designation: **AAA46C d EE-f.GG H/i J-K**

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AAA46C</b> | <b>Operating principle / construction</b><br>HT46C: Diffuse reflection sensor with background suppression<br>LS46C: Throughbeam photoelectric sensor transmitter<br>LE46C: Throughbeam photoelectric sensor receiver<br>PRK46C: Retro-reflective photoelectric sensor with polarization filter<br>RK46C: Retro-reflective photoelectric sensor                                                                                                                                                                                                                                                                                                                                                |
| <b>d</b>      | <b>Light type</b><br>n/a: red light<br>I: infrared light                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>EE</b>     | <b>Light source</b><br>n/a: LED<br>L1: laser class 1<br>L2: laser class 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>f</b>      | <b>Preset range (optional)</b><br>n/a: operating range acc. to data sheet<br>xxxF: Preset range [mm]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>GG</b>     | <b>Equipment</b><br>n/a: standard<br>1: 270° potentiometer<br>8: activation input (activation with high signal)<br>01: diffuse reflection sensor with background suppression (HT): HG tape (HighGain tape) is not detected from a distance of 900 mm with a set operating range of ≤ 450 mm (diffuse reflection: 6%, black)<br>D: Depolarizing media<br>E: Diffuse reflection sensor with background suppression (HT): optimized for dusty environments<br>SL: Diffuse reflection sensor with background suppression (HT): slit diaphragm 25 mm x 3 mm<br>P: throughbeam photoelectric sensor receiver (LE): edge filter for parallel operation<br>L: Light-band<br>XL: Extra long light spot |
| <b>H</b>      | <b>Operating range adjustment &amp; version</b><br>n/a with diffuse reflection sensor with background suppression (HT): range adjustment via mechanical adjusting spindle<br>n/a with retro-reflective photoelectric sensors (PRK): operating range not adjustable<br>1: retro-reflective photoelectric sensors (PRK/RK): sensitivity adjustment via potentiometer<br>3: teach-in via button<br>P2: resolution 2 mm                                                                                                                                                                                                                                                                           |
| <b>i</b>      | <b>Switching output/function OUT 1/IN: Pin 4 or black conductor</b><br>2: NPN transistor output, light switching<br>N: NPN transistor output, dark switching<br>4: PNP transistor output, light switching<br>P: PNP transistor output, dark switching<br>L: IO-Link<br>G: Push-pull switching output, PNP dark switching, NPN light switching<br>6: push-pull switching output, PNP light switching, NPN dark switching                                                                                                                                                                                                                                                                       |
| <b>J</b>      | <b>Switching output / function OUT 2/IN: pin 2 or white conductor</b><br>2: NPN transistor output, light switching<br>N: NPN transistor output, dark switching<br>4: PNP transistor output, light switching<br>P: PNP transistor output, dark switching<br>8: activation input (activation with high signal)<br>9: deactivation input (deactivation with high signal)<br>W: warning output<br>X: pin not used<br>G: Push-pull switching output, PNP dark switching, NPN light switching<br>6: push-pull switching output, PNP light switching, NPN dark switching                                                                                                                             |
| <b>K</b>      | <b>Electrical connection</b><br>n/a: cable, standard length 2000 mm, 4-wire<br>200-M12: cable, length 200 mm with M12 connector, 4-pin, axial (plug)<br>M12: M12 connector, 4-pin (plug)<br>500-M12: cable, length 500 mm with M12 connector, 4-pin, axial (plug)<br>1000-M12: cable, length 1000 mm with M12 connector, 4-pin, axial (plug)                                                                                                                                                                                                                                                                                                                                                  |

### Note



A list with all available device types can be found on the Leuze website at [www.leuze.com](http://www.leuze.com).

## 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.

### For UL applications:



- ⚠ For UL applications, use is only permitted in Class 2 circuits in accordance with the NEC (National Electric Code).
- ⚠ These proximity switches shall be used with UL Listed Cable assemblies rated 30V, 0.5A min, in the field installation, or equivalent (categories: CYJV/ CYJV7 or PVVA/PVVA7)

## Further information

- Light source: Average life expectancy 100,000 h at an ambient temperature of 25 °C
- Response time: For short decay times, an ohmic load of approx. 5kOhm is recommended

## Accessories

### Connection technology - Connection cables

|  | Part no. | Designation        | Article          | Description                                                                                                                                                                        |
|--|----------|--------------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50130652 | KD U-M12-4A-V1-050 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 4 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 5.000 mm<br>Sheathing material: PVC  |
|  | 50130690 | KD U-M12-4W-V1-050 | Connection cable | Connection 1: Connector, M12, Angled, Female, A-coded, 4 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 5.000 mm<br>Sheathing material: PVC |

### Note



- ⚠ A list with all available accessories can be found on the Leuze website in the Download tab of the article detailed page.