

## Technical data sheet

### Contrast sensor

Part no.: 50148511

KRT3CW.L3S1/4T-M8

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For illustration purposes only



# Technical data

## Basic data

|        |    |
|--------|----|
| Series | 3C |
|--------|----|

## Special version

|                 |               |
|-----------------|---------------|
| Special version | Teach input   |
|                 | Time function |

## Optical data

|                                      |                                      |
|--------------------------------------|--------------------------------------|
| Operating range                      | 14.5 mm ± 2 mm                       |
| Beam path                            | Focused                              |
| Light source                         | LED, White                           |
| Transmitted-signal shape             | Pulsed                               |
| LED group                            | Exempt group (in acc. with EN 62471) |
| Light spot size [at sensor distance] | 1.5 mm x 4 mm [14.5 mm]              |
| Light spot orientation               | Vertical                             |
| Type of light spot geometry          | Rectangular                          |
| Light beam exit                      | Front                                |
| Focus                                | Fixed                                |
| Wavelength                           | 400 ... 750 nm                       |

## Measurement data

|               |         |
|---------------|---------|
| Repeatability | 0.02 mm |
|---------------|---------|

## Electrical data

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

### Performance data

|                      |                                        |
|----------------------|----------------------------------------|
| Supply voltage $U_B$ | 12 ... 30 V, DC, Incl. residual ripple |
| Residual ripple      | 0 ... 15 %, From $U_B$                 |
| Open-circuit current | 0 ... 25 mA                            |

### Inputs

|                        |            |
|------------------------|------------|
| Number of teach inputs | 1 Piece(s) |
|------------------------|------------|

### Teach inputs

|                   |                             |
|-------------------|-----------------------------|
| Voltage type      | DC                          |
| Switching voltage | high: ≥8V                   |
|                   | low: ≤ 2 V or not connected |
| Delay             | 10 ms                       |
| Input resistance  | 15,000 Ω                    |

### Teach input 1

|                        |                              |
|------------------------|------------------------------|
| Function               | Keyboard lockout             |
|                        | Setting the pulse stretching |
|                        | Teach-in                     |
| Active switching state | High                         |
| Teach process          | Static 1-point               |

### Outputs

|                                     |            |
|-------------------------------------|------------|
| Number of digital switching outputs | 1 Piece(s) |
|-------------------------------------|------------|

### Switching outputs

|                         |                     |
|-------------------------|---------------------|
| Voltage type            | DC                  |
| Switching current, max. | 100 mA              |
| Switching voltage       | high: ≥( $U_B$ -2V) |
|                         | low: ≤ 2 V          |

## Switching output 1

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

## Time behavior

|                     |           |
|---------------------|-----------|
| Switching frequency | 10,000 Hz |
| Response time       | 0.05 ms   |
| Readiness delay     | 300 ms    |
| Response jitter     | 20 μs     |

## Connection

### Connection 1

|                    |                |
|--------------------|----------------|
| Function           | Signal OUT     |
|                    | Teach input    |
|                    | Voltage supply |
| Type of connection | Connector      |
| Thread size        | M8             |
| Type               | Male           |
| Material           | Metal          |
| No. of pins        | 4 -pin         |

## Mechanical data

|                            |                              |
|----------------------------|------------------------------|
| Design                     | Cubic                        |
| Dimension (W x H x L)      | 11.4 mm x 34.2 mm x 18.3 mm  |
| Housing material           | Plastic                      |
| Plastic housing            | PC-ABS                       |
| Lens cover material        | Plastic / PMMA               |
| Net weight                 | 10 g                         |
| Housing color              | Red                          |
| Type of fastening          | Via optional mounting device |
| Compatibility of materials | ECOLAB                       |

## Operation and display

|                                     |                                |
|-------------------------------------|--------------------------------|
| Type of display                     | LED                            |
| Number of LEDs                      | 2 Piece(s)                     |
| Operational controls                | Teach button                   |
| Function of the operational control | Setting the pulse stretching   |
|                                     | Switching-threshold adjustment |
|                                     | Teach-in                       |

## Environmental data

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

## Certifications

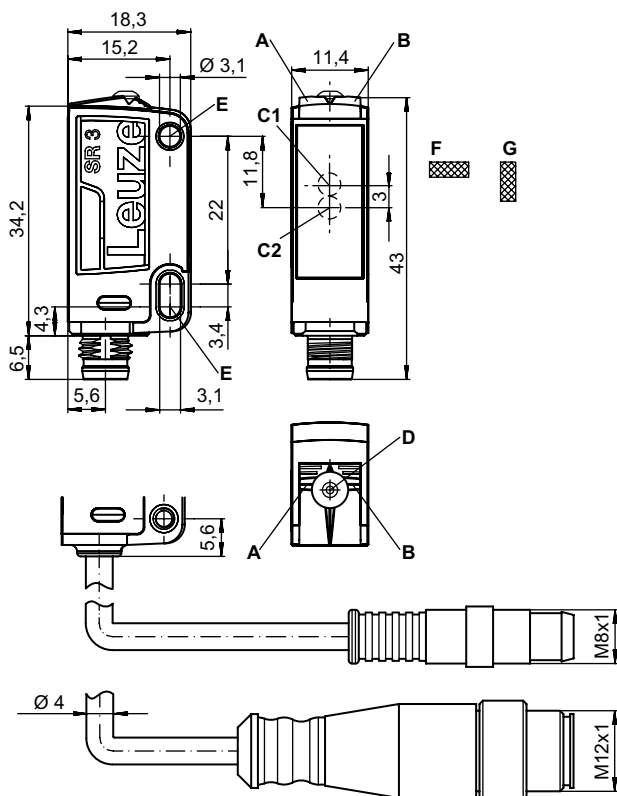
|                      |                  |
|----------------------|------------------|
| Degree of protection | IP 67            |
|                      | IP 69K           |
| Protection class     | III              |
| Approvals            | c UL US          |
| Standards applied    | EN IEC 60947-5-2 |

## Technical data

|                       |          |
|-----------------------|----------|
| Customs tariff number | 85365019 |
| ECLASS 5.1.4          | 27270906 |
| ECLASS 8.0            | 27270906 |
| ECLASS 9.0            | 27270906 |
| ECLASS 10.0           | 27270906 |
| ECLASS 11.0           | 27270906 |
| ECLASS 12.0           | 27270906 |
| ECLASS 13.0           | 27270906 |
| ECLASS 14.0           | 27270906 |
| ECLASS 15.0           | 27270906 |
| ECLASS 16.0           | 27270906 |
| ETIM 5.0              | EC001820 |
| ETIM 6.0              | EC001820 |
| ETIM 7.0              | EC001820 |
| ETIM 8.0              | EC001820 |
| ETIM 9.0              | EC001820 |
| ETIM 10.0             | EC001820 |
| UNSPSC 26.08          | 39121528 |

## Dimensioned drawings

All dimensions in millimeters



- A Green LED
- B Yellow LED
- C1 Optical axis (receiver)
- C2 Optical axis (transmitter)
- D Teach button
- E Mounting sleeve
- F Light spot orientation horizontal
- G Light spot orientation vertical

# Electrical connection

## Connection 1

|                           |                                             |
|---------------------------|---------------------------------------------|
| <b>Function</b>           | Signal OUT<br>Teach input<br>Voltage supply |
| <b>Type of connection</b> | Connector                                   |
| <b>Thread size</b>        | M8                                          |
| <b>Type</b>               | Male                                        |
| <b>Material</b>           | Metal                                       |
| <b>No. of pins</b>        | 4 -pin                                      |

| Pin | Pin assignment |
|-----|----------------|
| 1   | V+             |
| 2   | Teach-in       |
| 3   | GND            |
| 4   | OUT 1          |



# Operation and display

| Display LED 1           | Display LED 2            | Meaning               |
|-------------------------|--------------------------|-----------------------|
| Green, continuous light | Off                      | Operational readiness |
| Green, flashing, 3 Hz   | Yellow, flashing, 3 Hz   | Teach event active    |
| Green, flashing, 15 Hz  | Yellow, flashing, 15 Hz  | Teach error           |
| Green, continuous light | Yellow, continuous light | Mark detected         |

# Part number code

Part designation: **KRT3C A.BCDD/EF-G**

|              |                                                                                                                                                                                                                                                                                                    |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>KRT3C</b> | <b>Operating principle</b><br>KRT3C: Contrast sensor                                                                                                                                                                                                                                               |
| <b>A</b>     | <b>Light type</b><br>M: LED, multicolor<br>W: White light<br>L1: laser class 1                                                                                                                                                                                                                     |
| <b>B</b>     | <b>Light spot orientation</b><br>L: vertical<br>Q: horizontal                                                                                                                                                                                                                                      |
| <b>C</b>     | <b>Control button</b><br>3: teach-in via button                                                                                                                                                                                                                                                    |
| <b>DD</b>    | <b>Teach mode</b><br>S1: Static 1-point teach<br>S2: Static 2-point teach<br>D2: Dynamic 2-point teach                                                                                                                                                                                             |
| <b>E</b>     | <b>Switching output/function OUT 1/IN: Pin 4 or black conductor</b><br>2: NPN transistor output, light switching<br>4: PNP transistor output, light switching<br>6: push-pull switching output, PNP light switching, NPN dark switching<br>L: IO-Link / light switching (PNP)/dark switching (NPN) |
| <b>F</b>     | <b>Switching output / function OUT 2/IN: pin 2 or white conductor</b><br>G: Push-pull switching output, PNP dark switching, NPN light switching<br>T: teach-in via cable                                                                                                                           |

## Part number code

|          |                                                                                                                                                                                                                                                               |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>G</b> | <b>Electrical connection</b><br>n/a: cable, standard length 2000 mm, 4-wire<br>M8: M8 connector, 4-pin (plug)<br>200-M12: cable, length 200 mm with M12 connector, 4-pin, axial (plug)<br>200-M8: cable, length 200 mm with M8 connector, 4-pin, axial (plug) |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Note |                                                                                                                                |
|------|--------------------------------------------------------------------------------------------------------------------------------|
|      | A list with all available device types can be found on the Leuze website at <a href="http://www.leuze.com">www.leuze.com</a> . |

## Notes

| <b>Observe intended use!</b> |                                                                                                                                                                                                                                                                                       |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                              | <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> |

| <b>For UL applications:</b> |                                                                                                                       |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------|
|                             | ⌘ For UL applications, use is only permitted in Class 2 circuits in accordance with the NEC (National Electric Code). |

## Further information

- Sum of the output currents for both outputs, 50 mA for ambient temperatures > 40 °C

## Accessories


### Connection technology - Connection cables

|  | Part no. | Designation       | Article          | Description                                                                                                                                                                                                 |
|--|----------|-------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50130850 | KD U-M8-4A-V1-050 | Connection cable | Application: Chemical resistant<br>Connection 1: Connector, M8, Axial, Female, 4 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 5,000 mm<br>Sheathing material: PVC  |
|  | 50130871 | KD U-M8-4W-V1-050 | Connection cable | Application: Chemical resistant<br>Connection 1: Connector, M8, Angled, Female, 4 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 5,000 mm<br>Sheathing material: PVC |



## Accessories

| Part no. | Designation | Article | Description |
|----------|-------------|---------|-------------|
|----------|-------------|---------|-------------|

### Mounting technology - Mounting brackets

| Part no.                                                                         | Designation | Article | Description     |                                                                                                                                                                                          |
|----------------------------------------------------------------------------------|-------------|---------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50105546    | BT 3B   | Mounting device | Design of mounting device: Angle, L-shape<br>Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Screw type<br>Type of mounting device: Rigid<br>Material: Metal |

### Mounting technology - Rod mounts

| Part no.                                                                            | Designation | Article      | Description     |                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------|-------------|--------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | 50117829    | BTP 200M-D12 | Mounting system | Design of mounting device: Protection hood<br>Fastening, at system: For 12 mm rod<br>Mounting bracket, at device: Screw type<br>Type of mounting device: Clampable, Adjustable, Turning, 360°<br>Material: Metal                                                                                                                  |
|  | 50117255    | BTU 200M-D12 | Mounting system | Contains: 2x M3 x 16 screw, 2 M3 x 20 screws, 2x position washers<br>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 M3 screws<br>Type of mounting device: Clampable, Adjustable, Turning, 360°<br>Material: Metal |

#### Note



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