



the sensor people





Figure can vary

Part no.: 50129375 HT3C/4P-M8 Diffuse sensor with background suppression











Contents

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Technical data

Series 3C Operating principle Scanning principle with background suppression Optical data Black-white error < 10% up to 220 mm Operating range Guaranteed operating range Operating range Guaranteed operating range Operating range, white 90% 0.005 0.45 m Operating range, black 6% 0.01 0.34 m Operating range, plack 6% 0.015 0.22 m Operating range limit Typical operating range Operating range limit Q.005 0.45 m Operating range limit O.005 0.45 m Operating range limit Pypical operating range Operating range limit O.006 0.45 m Adjustment range I 51 450 mm Beam profile Focused Light source LED, Red LED light wavelength 633 mm LED protection class Exempt group (in acc. with EN 62471) Transmitted-signal shape Pulsed Transmitted-signal shape Pulsed Focus Fixed Fo	Basic data	
Optical data Seleck-white error	Series	3C
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Black-white error < 10% up to 220 mm Operating range (Charled Operating range) Operating range, white 90% Operating range, white 90% Operating range, gray 18% Operating range, black 6% Operating range, black 6% Operating range limit Operating range In Sundame Operating range limit Operating range In Sundame Operating range Opera		
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Operating range, gray 18% 0.01 0.34 m Operating range, black 6% 0.015 0.22 m Operating range limit Typical operating range Operating range limit 0.005 0.45 m Adjustment range 15 450 mm Beam profile Focused LED light wavelength 633 mm LED protection class Exempt group (in acc. with EN 62471) Transmitted-signal shape Pulsed Type of light-spot geometry Round Focus Fixed Focal distance 200 mm Electrical data Performance data Supply voltage 10 30 V, DC, Incl. residual ripple Residual ripple 0 15 %, From Us Oper-circuit current 0 15 mA Outputs Number of digital switching outputs 2 Piece(s) Switching output 1 Assignment Connection 1, pin 4 Switching output 2 Assignment Connection 1, pin 2	Operating range	Guaranteed operating range
Operating range, black 6% Operating range limit Operating outputs Operating outputs Operating output 1 Operating output 1 Operating output 2 O	Operating range, white 90%	0.005 0.45 m
Operating range limit Typical operating range Operating range limit 0.005 0.45 m Adjustment range 15 450 mm Beam profile Focused Light source LED, Red LED light wavelength 633 nm LED protection class Exempt group (in acc. with EN 62471) Transmitted signal shape Pulsed Type of light-spot geometry Round Focus Fixed Focal distance 200 mm Electrical date Protective circuit Polarity reversal protection Short circuit protected Supply voltage 10 30 V, DC, Incl. residual ripple Residual ripple 0 15 %, From UB Open-circuit current 0 15 %, From UB Open-circuit current 0 15 mA Outputs Voltage type Number of digital switching outputs 2 Piece(s) Switching outputs 2 Piece(s) Switching output 1 Assignment Assignment Connection 1, pin 4 Switching output 2 Light switching Assignment	Operating range, gray 18%	0.01 0.34 m
Operating range limit 0.005 0.45 m Adjustment range 15 450 mm Beam profile Focused Light source LED, Red LED light wavelength 633 nm LED protection class Exempt group (in acc. with EN 62471) Transmitted-signal shape Pulsed Type of light-spot geometry Round Focus Fixed Focal distance 200 mm Electrical data Polarity reversal protection Protective circuit Polarity reversal protection Short circuit protected Short circuit protected Performance data Supply voltage Supply voltage 10 30 V, DC, Incl. residual ripple Residual ripple 0 15 %, From UB Open-circuit current 0 15 mA Outputs Voltage type Number of digital switching outputs 2 Piece(s) Switching outputs 2 Piece(s) Switching output outputs 100 mA Switching output 1 Assignment Connection 1, pin 4 Switching output 2 Light switching <td>Operating range, black 6%</td> <td>0.015 0.22 m</td>	Operating range, black 6%	0.015 0.22 m
Adjustment range 15 450 mm Beam profile Focused Light source LED, Red LED light wavelength 633 mm LED protection class Exempt group (in acc. with EN 62471) Transmitted-signal shape Pulsed Type of light-spot geometry Round Focus Fixed Focal distance 200 mm Electrical data Protective circuit Polarity reversal protection Short circuit protected Supply voltage 10 30 V, DC, Incl. residual ripple Residual ripple 0 15 %, From UB Open-circuit current 0 15 mA Outpus Number of digital switching outputs 2 Piece(s) Switching output 1 Assignment Connection 1, pin 4 Switching output 2 Assignment Connection 1, pin 2 Switching olement Transistor, PNP Switching olement Connection 1, pin 2 Switching olement Transistor, PNP	Operating range limit	Typical operating range
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LED, Red LED light wavelength 633 nm LED protection class Exempt group (in acc. with EN 62471) Transmitted-signal shape Pulsed Type of light-spot geometry Round Focus Fixed Focal distance 200 mm Flectrical data Protective circuit Polarity reversal protection Short circuit protected Performance data Supply voltage 10 30 V, DC, Incl. residual ripple Residual ripple 0 15 %, From UB Open-circuit current 0 15 mA Outputs Number of digital switching outputs 2 Piece(s) Switching output 1 Assignment Switching output 2 Assignment Connection 1, pin 4 Switching output 2 Assignment Connection 1, pin 2 Transistor, PNP	Adjustment range	15 450 mm
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Transmitted-signal shape Type of light-spot geometry Round Focus Fixed Focal distance 200 mm Electrical data Protective circuit Performance data Supply voltage Residual ripple Open-circuit current Outputs Number of digital switching outputs Voltage type Switching output 1 Assignment Switching output 2 Assignment Switching output 2 Assignment Switching output 2 Assignment Switching output 2 Assignment Connection 1, pin 2 Fixed Sup Manuel Fixed Fixed Focus Focus Fixed Focus Focus Focus Fixed Focus Focus Focus Fixed Focus	LED light wavelength	633 nm
Type of light-spot geometry Focus Fixed Focal distance 200 mm Fixed	LED protection class	Exempt group (in acc. with EN 62471)
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Electrical data Protective circuit Polarity reversal protection Short circuit protected Performance data Supply voltage 10 30 V, DC, Incl. residual ripple Residual ripple 0 15 %, From UB Open-circuit current 0 15 mA Outputs Number of digital switching outputs 2 Piece(s) Switching outputs Voltage type DC Switching current, max. 100 mA Switching voltage High: ≥(UB-2V) Low: ≤2V Switching output 1 Assignment Connection 1, pin 4 Switching output 2 Assignment Connection 1, pin 2 Switching output 2 Assignment Connection 1, pin 2 Switching element Transistor, PNP	Focus	Fixed
Protective circuit Polarity reversal protection Short circuit protected Performance data Supply voltage Residual ripple Open-circuit current Outputs Number of digital switching outputs Voltage type Switching outputs Voltage type Switching current, max. Switching voltage High: ≥(UB-2V) Low: ≤2V Switching output 1 Assignment Connection 1, pin 4 Switching output 2 Assignment Connection 1, pin 2 Switching output 2 Assignment Connection 1, pin 2 Switching element Transistor, PNP Switching output 2 Assignment Connection 1, pin 2 Transistor, PNP	Focal distance	200 mm
Protective circuit Polarity reversal protection Short circuit protected Performance data Supply voltage Residual ripple Open-circuit current Outputs Number of digital switching outputs Voltage type Switching outputs Voltage type Switching current, max. Switching voltage High: ≥(UB-2V) Low: ≤2V Switching output 1 Assignment Connection 1, pin 4 Switching output 2 Assignment Connection 1, pin 2 Switching olement Switching output 2 Assignment Connection 1, pin 2 Switching element Transistor, PNP Switching element Connection 1, pin 2 Transistor, PNP		
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Residual ripple 0 15 %, From UB Open-circuit current 0 15 mA Outputs Number of digital switching outputs 2 Piece(s) Switching outputs Voltage type DC Switching current, max. 100 mA Switching voltage High: ≥(UB-2V) Low: ≤2V Switching output 1 Assignment Connection 1, pin 4 Switching element Transistor, PNP Switching output 2 Assignment Connection 1, pin 2 Switching element Transistor, PNP	Performance data	
Open-circuit current 0 15 mA Outputs 2 Piece(s) Number of digital switching outputs 2 Piece(s) Switching outputs DC Switching current, max. 100 mA Switching voltage High: ≥(UB-2V) Low: ≤2V Switching output 1 Connection 1, pin 4 Switching element Transistor, PNP Switching principle Light switching Switching output 2 Assignment Switching element Transistor, PNP Switching element Transistor, PNP	Supply voltage	10 30 V, DC, Incl. residual ripple
Outputs Number of digital switching outputs 2 Piece(s) Switching outputs Voltage type DC Switching current, max. 100 mA Switching voltage High: ≥(UB-2V) Low: ≤2V Low: ≤2V Switching output 1 Assignment Connection 1, pin 4 Switching element Transistor, PNP Switching output 2 Light switching Switching element Connection 1, pin 2 Switching element Transistor, PNP	Residual ripple	0 15 %, From U _B
Number of digital switching outputs Switching outputs Voltage type DC Switching current, max. 100 mA Switching voltage High: ≥(UB-2V) Low: ≤2V Switching output 1 Connection 1, pin 4 Switching element Transistor, PNP Switching principle Light switching Switching output 2 Assignment Switching element Connection 1, pin 2 Switching element Transistor, PNP	Open-circuit current	0 15 mA
Switching outputs Voltage type DC Switching current, max. 100 mA Switching voltage High: ≥(UB-2V) Low: ≤2V Switching output 1 Assignment Connection 1, pin 4 Switching element Transistor, PNP Switching principle Light switching Switching output 2 Connection 1, pin 2 Assignment Connection 1, pin 2 Switching element Transistor, PNP	Outputs	
Voltage type DC Switching current, max. 100 mA Switching voltage High: ≥(UB-2V) Low: ≤2V Switching output 1 Connection 1, pin 4 Switching element Transistor, PNP Switching principle Light switching Switching output 2 Connection 1, pin 2 Switching element Transistor, PNP	Number of digital switching outputs	2 Piece(s)
Switching current, max. 100 mA Switching voltage High: ≥(UB-2V) Low: ≤2V Switching output 1 Connection 1, pin 4 Assignment Transistor, PNP Switching element Light switching Switching output 2 Light switching 2 Assignment Connection 1, pin 2 Switching element Transistor, PNP	Switching outputs	
Switching voltage High: ≥(UB-2V) Low: ≤2V Switching output 1 Connection 1, pin 4 Assignment Transistor, PNP Switching element Light switching Switching output 2 Light switching Assignment Connection 1, pin 2 Switching element Transistor, PNP	Voltage type	DC
Low: ≤2V 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 current, max.	100 mA
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 voltage	
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	Curitahina autaut d	LOW: \$2V
Switching element Switching principle Light switching Switching output 2 Assignment Connection 1, pin 2 Switching element Transistor, PNP		Connection 1 nin 4
Switching principle Light switching Switching output 2 Assignment Connection 1, pin 2 Switching element Transistor, PNP		•
Switching output 2 Assignment Connection 1, pin 2 Switching element Transistor, PNP		
Assignment Connection 1, pin 2 Switching element Transistor, PNP		Light switching
Switching element Transistor, PNP		Connection 1 pin 2
		*
Ownering principle Dark Switching		
	омистину ринстріе	Dain switching
Timing	Timing	
Switching frequency 1,000 Hz		1,000 Hz
Response time 0.5 ms		



Readiness delay	300 ms
Response jitter	166 μs

onnection		
Connection 1		
Type of connection	Connector	
Function	Signal OUT Voltage supply	
Thread size	M8	
Туре	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, PC-ABS	
Lens cover material	Plastic / PMMA	
Net weight	10 g	
Housing color	Red	
Type of fastening	Through-hole mounting Via optional mounting device	
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	Scanning range adjustment	

Environmental data		
Ambient temperature, operation	-40 60 °C	
Ambient temperature, storage	-40 70 °C	

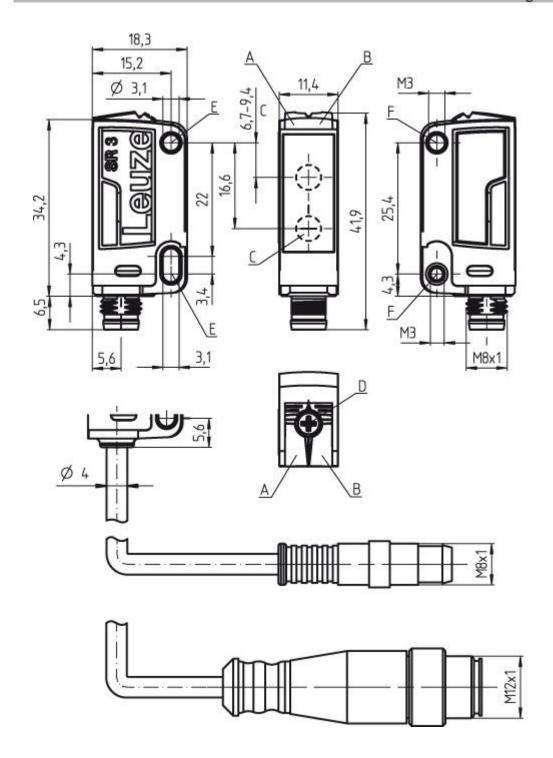
Certifications		
Degree of protection	IP 67 IP 69K	
Protection class	III	
Certifications	c UL US	
Standards applied	IEC 60947-5-2	

Classification		
eCl@ss 8.0	27270904	
eCl@ss 9.0	27270904	
ETIM 5.0	EC002719	

Dimensioned drawings

All dimensions in millimeters





- Green LED
- Yellow LED
- ABCDEF Optical axis

- Multiturn potentiometer
 Mounting sleeve (standard)
 Threaded sleeve (3C.B series)

Electrical connection

Connection 1	
Type of connection	Connector



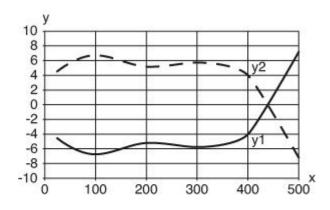
Connection 1	
Function	Signal OUT Voltage supply
Thread size	M8
Туре	Male
Material	Metal
No. of pins	4 -pin
Encoding	

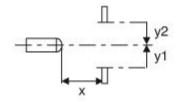
Pin	Pin assignment
1	V+
2	OUT 2
3	GND
4	OUT 1



Diagrams

Typ. response behavior (white 90 %)

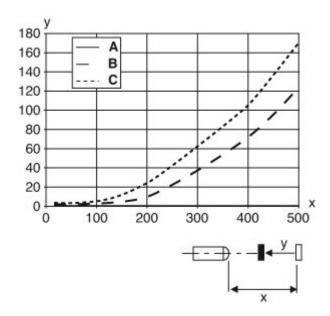




- Distance [mm] Misalignment [mm]



Typ. black/white behavior



Range [mm] Reduction of range [mm]

White 90%

y A B C Gray 18% Black 6%

Operation and display

LEDs

LED	Display	Meaning
1	Green, continuous light	Ready
2	Yellow, continuous light	Object detected

Part number code

Part designation: AAA 3C d EE-f.GG H/i J-K-L

-	
AAA3C	Operating principle / construction: HT3C: diffuse reflection sensor with background suppression LS3C: throughbeam photoelectric sensor transmitter LE3C: throughbeam photoelectric sensor receiver PRK3C: retro-reflective photoelectric sensor with polarization filter
d	Light type: n/a: red light I: infrared light
EE	Light source: n/a: LED L1: laser class 1 L2: laser class 2
f	Pre-set scanning range (optional): n/a: operating range acc. to data sheet XXXX: pre-set scanning range [mm]



GG	Equipment: n/a: standard A: autocollimation principle (single lens) for positioning tasks B: housing model with two M3 threaded sleeves, brass F: permanently set scanning range L: long light spot S: small light spot T: autocollimation principle (single lens) for highly transparent bottles without tracking TT: autocollimation principle (single lens) for highly transparent bottles with tracking V: V-optics XL: extra long light spot
Н	Operating range adjustment: n/a with HT: scanning range adjustable via 8-turn potentiometer 1: 270° potentiometer 3: teach-in via button 6: auto-teach
i	Switching output/function OUT 1/IN: Pin 4 or black conductor: 2: NPN transistor output, light switching N: NPN transistor output, dark switching 4: PNP transistor output, light switching P: PNP transistor output, dark switching 6: push-pull switching output, PNP light switching, NPN dark switching G: push-pull switching output, PNP dark switching, NPN light switching L: IO-Link 8: activation input (activation with high signal) X: not connected (n. c.)
J	Switching output / function OUT 2/IN: pin 2 or white conductor: 2: NPN transistor output, light switching N: NPN transistor output, dark switching 4: PNP transistor output, light switching P: PNP transistor output, dark switching 6: push-pull switching output, PNP light switching, NPN dark switching G: push-pull switching output, PNP dark switching, NPN light switching W: warning output X: not connected (n. c.) 8: activation input (activation with high signal) 9: deactivation input (deactivation with high signal) T: teach-in via cable
К	Electrical connection: n/a: cable, PVC, standard length 2000 mm, 4-wire 5000: cable, PVC, standard length 5000 mm, 4-wire M8: M8 connector, 4-pin (plug) M8.3: M8 connector, 3-pin (plug) 200-M8: cable, PVC, length 200 mm with M8 connector, 4-pin, axial (plug) 200-M8.3: cable, PVC, length 200 mm with M8 connector, 3-pin, axial (plug) 200-M12: cable, PVC, length 200 mm with M12 connector, 4-pin, axial (plug)

Accessories

Connection technology - Connection cables

Part no.	Designation	Article	Description
50106152	K-D M8A-4P-2m- FAB	Connection cable	Connection 1: Connector, M8, Axial, Female, 4 -pin Connection 2: Open end Shielded: No Cable length: 2,000 mm Sheathing material: FAB
50106153	K-D M8A-4P-5m- FAB	Connection cable	Connection 1: Connector, M8, Axial, Female, 4 -pin Connection 2: Open end Shielded: No Cable length: 5,000 mm Sheathing material: FAB
50106154	K-D M8W-4P-2m- FAB	Connection cable	Connection 1: Connector, M8, Angled, Female, 4 -pin Connection 2: Open end Shielded: No Cable length: 2,000 mm Sheathing material: FAB



Part no.	Designation	Article	Description
50106155	K-D M8W-4P-5m- FAB	Connection cable	Connection 1: Connector, M8, Angled, Female, 4 -pin Connection 2: Open end Shielded: No Cable length: 5,000 mm Sheathing material: FAB
50130854	KD U-M8-4A- P1-020	Connection cable	Connection 1: Connector, M8, Axial, Female, 4 -pin Connection 2: Open end Shielded: No Cable length: 2,000 mm Sheathing material: PUR
50130856	KD U-M8-4A- P1-050	Connection cable	Connection 1: Connector, M8, Axial, Female, 4 -pin Connection 2: Open end Shielded: No Cable length: 5,000 mm Sheathing material: PUR
50130857	KD U-M8-4A- P1-100	Connection cable	Connection 1: Connector, M8, Axial, Female, 4 -pin Connection 2: Open end Shielded: No Cable length: 10,000 mm Sheathing material: PUR
50130848	KD U-M8-4A- V1-020	Connection cable	Connection 1: Connector, M8, Axial, Female, 4 -pin Connection 2: Open end Shielded: No Cable length: 2,000 mm Sheathing material: PVC
50130850	KD U-M8-4A- V1-050	Connection cable	Connection 1: Connector, M8, Axial, Female, 4 -pin Connection 2: Open end Shielded: No Cable length: 5,000 mm Sheathing material: PVC
50130851	KD U-M8-4A- V1-100	Connection cable	Connection 1: Connector, M8, Axial, Female, 4 -pin Connection 2: Open end Shielded: No Cable length: 10,000 mm Sheathing material: PVC
50130873	KD U-M8-4W- P1-020	Connection cable	Connection 1: Connector, M8, Angled, Female, 4 -pin Connection 2: Open end Shielded: No Cable length: 2,000 mm Sheathing material: PUR
50130875	KD U-M8-4W- P1-050	Connection cable	Connection 1: Connector, M8, Angled, Female, 4 -pin Connection 2: Open end Shielded: No Cable length: 5,000 mm Sheathing material: PUR
50130876	KD U-M8-4W- P1-100	Connection cable	Connection 1: Connector, M8, Angled, Female, 4 -pin Connection 2: Open end Shielded: No Cable length: 10,000 mm Sheathing material: PUR



	Part no.	Designation	Article	Description
W/	50130869	KD U-M8-4W- V1-020	Connection cable	Connection 1: Connector, M8, Angled, Female, 4 -pin Connection 2: Open end Shielded: No Cable length: 2,000 mm Sheathing material: PVC
) D	50130871	KD U-M8-4W- V1-050	Connection cable	Connection 1: Connector, M8, Angled, Female, 4 -pin Connection 2: Open end Shielded: No Cable length: 5,000 mm Sheathing material: PVC
\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	50130872	KD U-M8-4W- V1-100	Connection cable	Connection 1: Connector, M8, Angled, Female, 4 -pin Connection 2: Open end Shielded: No Cable length: 10,000 mm Sheathing material: PVC

Connection technology - Interconnection cables

	Part no.	Designation	Article	Description
	50130916		Interconnection cable	Connection 1: Connector, M8, Axial, Female, 4 -pin Connection 2: Connector, M8, Axial, Male, 4 -pin Shielded: No Cable length: 2,000 mm Sheathing material: PUR

Mounting technology - Mounting brackets

	Part no.	Designation	Article	Description
	50118542	BT 200M.5	Mounting bracket	Design of mounting device: Angle, L-shape Mounting bracket, at system: Through-hole mounting Mounting bracket, at device: Screw type Type of mounting device: Adjustable Material: Stainless steel
	50124651	BT 205M	Mounting device set	Contains: 10x Design of mounting device: Angle, L-shape Mounting bracket, at system: Through-hole mounting Mounting bracket, at device: Screw type Type of mounting device: Rigid Material: Metal
- 96	50060511	BT 3	Mounting device	Design of mounting device: Angle, L-shape Mounting bracket, at system: Through-hole mounting Mounting bracket, at device: Screw type Type of mounting device: Rigid Material: Metal
	50105585	BT 3.1	Mounting strap set	Contains: 10x Design of mounting device: Retaining clip Mounting bracket, at system: Through-hole mounting Mounting bracket, at device: Screw type Type of mounting device: Rigid Material: Metal



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

Mounting technology - Rod mounts

	Part no.	Designation	Article	Description
	50117256	BTU 200M-D10	Mounting system	Contains: 2x M3 x 18 screw, 2x position washers Design of mounting device: Mounting system Mounting bracket, at system: For 10 mm rod, Sheet-metal mounting Mounting bracket, at device: Screw type Type of mounting device: Clampable, Adjustable, Turning, 360° Material: Metal
	50117255	BTU 200M-D12	Mounting system	Contains: 2x M3 x 18 screw, 2x position washers Design of mounting device: Mounting system Mounting bracket, at system: For 12 mm rod, Sheet-metal mounting Mounting bracket, at device: Screw type Type of mounting device: Clampable, Adjustable, Turning, 360° Material: Metal
f:	50117254	BTU 200M-D14	Mounting system	Contains: 2x M3 x 18 screw, 2x position washers Design of mounting device: Mounting system Mounting bracket, at system: For 14 mm rod, Sheet-metal mounting Mounting bracket, at device: Screw type Type of mounting device: Clampable, Adjustable, Turning, 360° Material: Metal
	50120426	BTU 200M.5-D12	Mounting system	Contains: 2x M3 x 18 screw, 2x M3 mounting nut, 2x position washers Design of mounting device: Mounting system Mounting bracket, at system: For 12 mm rod Mounting bracket, at device: Screw type Type of mounting device: Turning, 360°, Clampable, Adjustable Material: Stainless steel

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)

Leuze electronic GmbH + Co. KG, In der Braike 1, D-73277 Owen Phone: +49 7021 573-0, Fax +49 7021 573-199



- 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. 5 kOhm is recommended
- Sum of the output currents for both outputs, 50 mA for ambient temperatures > 40 °C