

# **△** Leuze electronic

the sensor people





Part no.: 50137823 ODS9L2.8/L6X-200-M12 Optical distance sensor







**② IO**-Link



Figure can vary

# **Contents**

- Technical data
- Dimensioned drawings
- Electrical connection
- Diagrams
- Operation and display
- · Part number code
- Notes
- Accessories



## **Technical data**

Series 9 Application   Fill-level monitoring Length measurement in material cutting Object in Market object    Optical data   Collimated   Collimated   Light source   Laser , Red   Laser , Red   Laser class   Collimated   Light wavelength   Collimated   Collimated	Basic data	
Application  Fill-level monitoring Longth measurement in alterial cutting Object measurement  Type of scanning system  Against object   Cottcal data  Beam profile  Laser pred Laser light wavelength  Easer pred Laser light wavelength  Easer pred  Easer light wavelength  Easer pred  Easer light wavelength  Easer pred		Q
Optical data Beam profile Light source Laser (Red Laser (Red Laser (Bath Laser class) 2 , IEC/EN 60825-1:2007 Transmitted-signal shape Pulsed Pulsed Pulsed Pulsed Pulsed Pulsed Pulsed Pulsed (James of Market) Pulsed Pu	Application	Fill-level monitoring Length measurement in material cutting
Beam profile Collimated Light source Laser , Red Laser (and Wavelength 650 nm Laser class 2, IEC/EN 60825-1:2007 Transmitted-signal shape Pulsed Pulse duration 22,000 µs Light-spot size (at sensor distance) 1 mm [650 mm] Type of light-spot geometry Round  Measurement data Measurement range 50 200 mm  Resolution 0.01 mm with measurement range of 50 mm 100 mm 0.1 mm with measurement range of 100 mm 200 mm  Accuracy, short range 0.5 % 50 100 mm  Accuracy, distant range 1 % 100 200 mm  Reproducibility (1 sigma) 0.05 mm  Referencing No Optical distance measurement principle Triangulation  Electrical data  Protective circuit Polarity reversal protection Short circuit protected Transient protection Short circuit protected Transient protection  Open-circuit current 0 50 mA  Outputs  Number of digital switching outputs 2 Piece(s)  Switching outputs  Vollage lype DC Setting for the switching outputs Independently adjustable switching outputs Switching output 1  Assignment Connection 1, pin 4 Switching output 2	Type of scanning system	•
Laser (pith source	Optical data	
Laser light wavelength 650 nm Laser class 2, IEC/EN 60825-1:2007 Transmitted-signal shape Pulsed Pulsed Pulse duration 22,000 µs Light-spot size [at sensor distance] 1 mm [650 mm] Type of light-spot geometry Round  Measurement date  Measurement trange 50 200 mm  Measurement range 50 200 mm Accuracy, short range 0.5 % 50 100 mm Accuracy, short range 1 % 100 mm 200 mm Accuracy, distant range 1 % 100 mm 200 mm Accuracy, distant range 1 % 100 mm Accuracy, distant range 1 % 100 mm Accuracy distant range 1 % 100 mm  Referencing No Optical distance measurement principle Triangulation  Efectrical date  Protective circuit Protection Short circuit protected Transient protection Short circuit protected Transient protection Short circuit protected Transient protection Short circuit protectio	Beam profile	Collimated
Laser class 2, IEC/EN 60825-1:2007 Transmitted-signal shape Pulsed duration 22,000 µs Light-spot size [at sensor distance] 1 mm [550 mm] Type of light-spot size [at sensor distance] 1 mm [550 mm] Type of light-spot geometry Round  **Measurement data**  **Measurement range 50 200 mm  **Measurement range 50 200 mm  **Measurement range 50 200 mm  **Accuracy, short range 0.5 % 50 100 mm  **Accuracy, short range 1 % 100 200 mm  **Accuracy, distant range 1 % 100 200 mm  **Reproducibility (1 sigma) 0.05 mm  **Referencing No  **Optical distance measurement principle Triangulation  **Electrical data**  **Protective circuit Protected Transient	Light source	Laser , Red
Transmitted-signal shape Pulsed Pulse duration 22,000 µs Light-spot size [at sensor distance] 1 mm [650 mm] Type of light-spot geometry Round  Measurement data  Measurement range 50 200 mm  Resolution 0.1 mm with measurement range of 50 mm 100 mm 0.1 mm with measurement range of 50 mm 200 mm  Accuracy, short range 0.5 % 50 100 mm  Accuracy, short range 1 % 100 mm  Accuracy, slottant range 1 % 100 mm  Accuracy, slottant range 1 % 100 mm  Accuracy, slottant range 1 % 100 mm  Referencing No Optical distance measurement principle Triangulation  Electrical data  Protective circuit Polarity reversal protection Short circuit protected Transfer protection  Performance data Supply voltage Us 18 30 V , DC  Residual ripple 0 15 % , From Us Open-circuit current 0 50 mA  Outputs  Number of digital switching outputs 2 Piece(s)  Switching outputs  Voltage type DC  Setting for the switching outputs Independently adjustable switching outputs  Switching output 1  Assignment Connection 1, pin 4  Switching output 2	Laser light wavelength	650 nm
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Measurement data  Measurement range 50 200 mm  Resolution 0.1 mm with measurement range of 50 mm 100 mm 0.1 mm with measurement range of 50 mm 100 mm 0.1 mm with measurement range of 100 mm 200 mm  Accuracy, short range 0.5 % 50 100 mm  Accuracy, short range 1 % 100 200 mm  Reproducibility (1 sigma) 0.05 mm  Referencing No  Optical distance measurement principle Triangulation  Electrical data  Protective circuit Polarity reversal protection Short circuit protected Transient protection  Performance data  Supply voltage UB 18 30 V , DC  Residual ripple 0 15 % , From UB  Open-circuit current 0 50 mA  Outputs  Number of digital switching outputs 2 Piece(s)  Switching outputs  Voltage type DC  Setting for the switching outputs independently adjustable switching outputs  Switching output 1  Assignment Connection 1, pin 4  Transistor , Push-pull  Switching output 2	Pulse duration	22,000 μs
Measurement data       Measurement range     50 200 mm       Resolution     0.01 mm with measurement range of 50 mm 100 mm o.1 mm with measurement range of 100 mm 200 mm       Accuracy, short range     0.5 % 50 100 mm       Accuracy, distant range     1 % 100 200 mm       Reproducibility (1 sigma)     0.05 mm       Referencing     No       Optical distance measurement principle     Triangulation       Electrical date     Polarity reversal protection       Protective circuit     Polarity reversal protection       Short circuit protected Transient protection     Short direcuit protected Transient protection       Performance data     3 may 1, DC       Supply voltage UB     18 30 V, DC       Residual ripple     0 15 %, From UB       Open-circuit current     0 50 mA       Outputs       Number of digital switching outputs     2 Piece(s)       Switching outputs       Voltage type     DC       Setting for the switching outputs     Independently adjustable switching outputs       Switching output 1     Assignment       Switching output 2     Connection 1, pin 4       Switching output 2	Light-spot size [at sensor distance]	1 mm [650 mm]
Measurement range       50 200 mm         Resolution       0.01 mm with measurement range of 50 mm 100 mm 0.1 mm with measurement range of 100 mm 200 mm         Accuracy, short range       0.5 % 50 100 mm         Accuracy, distant range       1 % 100 200 mm         Reproducibility (1 sigma)       0.05 mm         Referencing       No         Optical distance measurement principle       Triangulation         Electrical data         Protective circuit       Polarity reversal protection Short circuit protected Transient protection         Supply voltage UB       18 30 V , DC         Residual ripple       0 15 % , From UB         Open-circuit current       0 50 mA         Outputs         Number of digital switching outputs       2 Piece(s)         Switching outputs         Voltage type       DC         Setting for the switching outputs       Independently adjustable switching outputs         Switching output 1       Assignment         Switching element       Transistor , Push-pull         Switching output 2	Type of light-spot geometry	Round
Measurement range       50 200 mm         Resolution       0.01 mm with measurement range of 50 mm 100 mm 0.1 mm with measurement range of 100 mm 200 mm         Accuracy, short range       0.5 % 50 100 mm         Accuracy, distant range       1 % 100 200 mm         Reproducibility (1 sigma)       0.05 mm         Referencing       No         Optical distance measurement principle       Triangulation         Electrical data         Protective circuit       Polarity reversal protection Short circuit protected Transient protection         Supply voltage UB       18 30 V , DC         Residual ripple       0 15 % , From UB         Open-circuit current       0 50 mA         Outputs         Number of digital switching outputs       2 Piece(s)         Switching outputs         Voltage type       DC         Setting for the switching outputs       Independently adjustable switching outputs         Switching output 1       Assignment         Switching element       Transistor , Push-pull         Switching output 2	Measurement data	
Resolution  0.01 mm with measurement range of 50 mm 100 mm 0.1 mm with measurement range of 100 mm 200 mm  Accuracy, short range  0.5 % 50 100 mm  Accuracy, distant range  1 % 100 200 mm  Reproducibility (1 sigma)  0.05 mm  Referencing  No  Optical distance measurement principle  Triangulation   Electrical data  Protective circuit  Polarity reversal protection Short circuit protected Transient protection  Performance data  Supply voltage Us  18 30 V , DC  Residual ripple  0 15 % , From UB  Open-circuit current  0 50 mA  Outputs  Number of digital switching outputs  2 Piece(s)  Switching outputs  Voltage type  DC  Setting for the switching outputs  Independently adjustable switching outputs  Switching output  Assignment  Connection 1, pin 4  Switching element  Switching principle  Open-circuit (NPN)  Switching output 2		50 200 mm
Accuracy, short range  Accuracy, distant range  1 % 100 200 mm  Reproducibility (1 sigma)  0.05 mm  Referencing  No Optical distance measurement principle  Finangulation  Fiectrical data  Protective circuit  Performance data Supply voltage UB Residual ripple  Open-circuit current  Outputs  Number of digital switching outputs  Voltage type  Setting for the switching outputs  Switching voltage  Switching output 1  Assignment  Connection 1, pin 4  Switching output 2  Switching output 2  Switching output 2	Resolution	0.01 mm with measurement range of 50 mm 100 mm 0.1 mm with measurement range of 100 mm 200 mm
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Reproducibility (1 sigma)  Referencing  No Optical distance measurement principle  Flectrical data  Protective circuit  Polarity reversal protection Short circuit protected Transient protection Short circuit protected Transient protection  Performance data Supply voltage UB  Residual ripple  Open-circuit current  Oumputs  Number of digital switching outputs  Voltage type  DC  Setting for the switching outputs  Directive circuit  Switching output 1  Assignment  Connection 1, pin 4  Switching output 2  Switching output 2	Accuracy, distant range	1 % 100 200 mm
Referencing No Optical distance measurement principle Triangulation  Electrical data Protective circuit Polarity reversal protection Short circuit protected Transient protection Short circuit protected Transient protection  Performance date Supply voltage UB 18 30 V , DC Residual ripple 0 15 % , From UB Open-circuit current 0 50 mA  Outputs Number of digital switching outputs 2 Piece(s)  Switching outputs Voltage type DC Setting for the switching outputs Independently adjustable switching outputs Switching voltage High: ≥(UB-2V) Low: ≤2V  Switching output 1 Assignment Connection 1, pin 4 Switching element Transistor , Push-pull Switching output 2		0.05 mm
Electrical data         Protective circuit       Polarity reversal protection Short circuit protected Transient protection         Performance data         Supply voltage UB       18 30 V , DC         Residual ripple       0 15 % , From UB         Open-circuit current       0 50 mA         Outputs         Number of digital switching outputs       2 Piece(s)         Switching outputs         Voltage type       DC         Setting for the switching outputs       Independently adjustable switching outputs         Switching voltage       High: ≥(UB-2V) Low: ≤2V         Switching output 1       Connection 1, pin 4         Switching element       Transistor , Push-pull         Switching output 2       IO-Link / light switching (PNP)/dark switching (NPN)		No
Electrical data  Protective circuit Protection Short circuit protected Transient protection Short circuit protected Transient protection  Performance data  Supply voltage UB 18 30 V , DC  Residual ripple 0 15 % , From UB  Open-circuit current 0 50 mA  Outputs  Number of digital switching outputs 2 Piece(s)  Switching outputs  Voltage type DC  Setting for the switching outputs Independently adjustable switching outputs  Switching voltage High: ≥(UB-2V) Low: ≤2V  Switching output 1  Assignment Connection 1, pin 4  Switching principle IO-Link / light switching (PNP)/dark switching (NPN)  Switching output 2		
Protective circuit  Polarity reversal protection Short circuit protected Transient protection  Performance data  Supply voltage UB  Residual ripple  Open-circuit current  Outputs  Number of digital switching outputs  Voltage type  DC  Setting for the switching outputs  Switching voltage  High: ≥(UB-2V) Low: ≤2V  Switching output 1  Assignment  Switching element  Switching output 2  Connection 1, pin 4  Switching output 2		Triangulation
Protective circuit  Polarity reversal protection Short circuit protected Transient protection  Performance data  Supply voltage UB  Residual ripple  Open-circuit current  Outputs  Number of digital switching outputs  Voltage type  DC  Setting for the switching outputs  Switching voltage  High: ≥(UB-2V) Low: ≤2V  Switching output 1  Assignment  Switching element  Switching output 2  Connection 1, pin 4  Switching output 2	Optical distance measurement principle	Triangulation
Supply voltage U <sub>B</sub> Residual ripple  0 15 % , From U <sub>B</sub> Open-circuit current  0 50 mA  Outputs  Number of digital switching outputs  2 Piece(s)  Switching outputs  Voltage type  DC  Setting for the switching outputs  Switching voltage  High: ≥(U <sub>B</sub> -2V) Low: ≤2V  Switching output 1  Assignment  Connection 1, pin 4  Switching principle  IO-Link / light switching (PNP)/dark switching (NPN)  Switching output 2	Optical distance measurement principle	Triangulation
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Open-circuit current       0 50 mA         Outputs       2 Piece(s)         Number of digital switching outputs       2 Piece(s)         Voltage type       DC         Setting for the switching outputs       Independently adjustable switching outputs         Switching voltage       High: ≥(UB-2V) Low: ≤2V         Switching output 1       Connection 1, pin 4         Switching element       Transistor , Push-pull         Switching principle       IO-Link / light switching (PNP)/dark switching (NPN)         Switching output 2	Optical distance measurement principle  Electrical data  Protective circuit	Polarity reversal protection Short circuit protected
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Number of digital switching outputs         Switching outputs         Voltage type       DC         Setting for the switching outputs       Independently adjustable switching outputs         Switching voltage       High: ≥(UB-2V) Low: ≤2V         Switching output 1         Assignment       Connection 1, pin 4         Switching element       Transistor , Push-pull         Switching principle       IO-Link / light switching (PNP)/dark switching (NPN)         Switching output 2	Optical distance measurement principle  Electrical data  Protective circuit  Performance data  Supply voltage UB	Polarity reversal protection Short circuit protected Transient protection  18 30 V , DC
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Switching element Transistor , Push-pull  Switching principle IO-Link / light switching (PNP)/dark switching (NPN)  Switching output 2	Optical distance measurement principle  Electrical data Protective circuit  Performance data Supply voltage UB Residual ripple Open-circuit current  Outputs Number of digital switching outputs  Voltage type Setting for the switching outputs	Polarity reversal protection Short circuit protected Transient protection  18 30 V , DC  0 15 % , From UB  0 50 mA  2 Piece(s)  DC Independently adjustable switching outputs High: ≥(UB-2V)
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Switching output 2	Optical distance measurement principle  Electrical data Protective circuit  Performance data Supply voltage UB Residual ripple Open-circuit current  Outputs Number of digital switching outputs  Voltage type Setting for the switching outputs Switching voltage  Switching output 1	Polarity reversal protection Short circuit protected Transient protection  18 30 V , DC  0 15 % , From UB  0 50 mA  2 Piece(s)  DC Independently adjustable switching outputs High: ≥(UB-2V) Low: ≤2V
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Outlief the market state of the Control of the Cont	Performance data Supply voltage UB Residual ripple Open-circuit current Outputs Number of digital switching outputs  Switching outputs Voltage type Setting for the switching outputs Switching voltage  Switching output 1 Assignment Switching output 2 Assignment	Polarity reversal protection Short circuit protected Transient protection  18 30 V , DC  0 15 % , From UB  0 50 mA  2 Piece(s)  DC Independently adjustable switching outputs High: ≥(UB-2V) Low: ≤2V  Connection 1, pin 4 Transistor , Push-pull IO-Link / light switching (PNP)/dark switching (NPN)



Timing			
Response time	1 ms , Under constant ambient conditions, 90% diffuse reflection, standard measure mode		
Readiness delay	300 ms		
Interface			
Туре	IO-Link		
IO-Link			
COM mode	COM3		
Profile	Smart sensor profile		
Frame type	2.V		
Port type	A		
Specification	V1.1		
SIO-mode support	Yes		
Process data IN	4 byte		
Process data OUT	8 bit		
Dual-core operating mode	Yes		
Min. cycle time	COM3 = 0.5 ms		
Connection			
Number of connections	1 Piece(s)		
Connection 1	111000(0)		
Type of connection	Connector , Turning, 90°		
Function	Signal OUT		
i unction	Voltage supply		
Thread size	M12		
Туре	Male		
Material	Plastic		
No. of pins	5 -pin		
Encoding	A-coded		
Mechanical data			
Design	Cubic		
Dimension (W x H x L)	21 mm x 50 mm x 50 mm		
Lens cover material	Glass		
Net weight	50 g		
Housing color	Red		
Type of fastening	Through-hole mounting Via optional mounting device		
Operation and display			
Type of display	LED OLED display		
Number of LEDs	2 Piece(s)		
Operational controls	Control buttons PC software		
Environmental data			
Ambient temperature, operation	-20 50 °C		
Ambient temperature, storage	-30 70 °C		

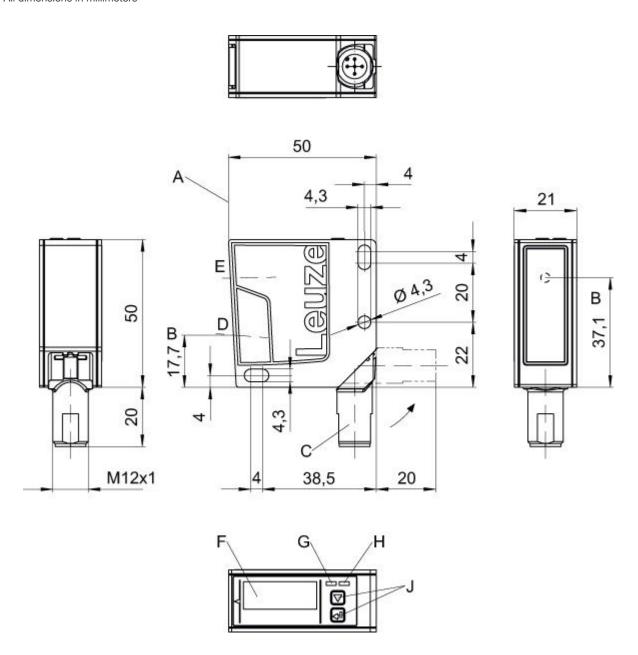


Certifications	
Degree of protection	IP 67
Protection class	III
Certifications	UL

Classification	
Customs tariff number	90318020
eCl@ss 8.0	27270801
eCl@ss 9.0	27270801
ETIM 5.0	EC001825
ETIM 6.0	EC001825

## **Dimensioned drawings**

All dimensions in millimeters



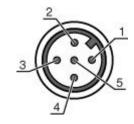


- A Reference edge for the measurement
- B Optical axis
- C Device plug M12
- D Receiver
- E Transmitter
- F Color display
- G Yellow LED
- H Green LED
- J Control buttons

### **Electrical connection**

Connection 1	
Type of connection	Connector
Function	Signal OUT Voltage supply
Thread size	M12
Туре	Male
Material	Plastic
No. of pins	5 -pin
Encoding	A-coded

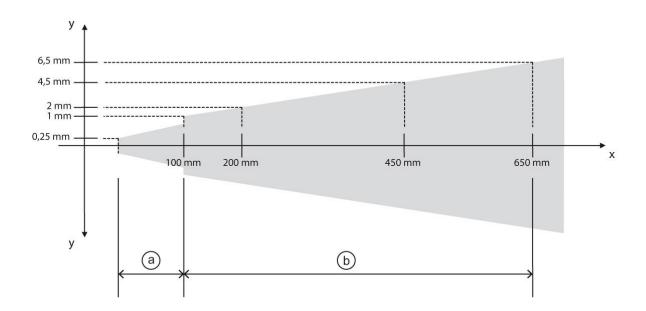
Pin	Pin assignment
1	18 30 V DC +
2	OUT 2
3	GND
4	IO-Link / OUT 1
5	n.c.





## **Diagrams**

Accuracy of measurement of ODS 9 (measurement value \* 0.01 = maximum measurement error):



- Measurement distance
- y a Max. measurement error
- 0.5% of measurement value
- 1% of measurement value

# **Operation and display**

### **LEDs**

LED	Display	Meaning
1	Green, continuous light	Ready
2	Yellow, continuous light	Object in the measurement range

### Part number code

Part designation: ODS9XX.Y/ZAB-CCC-DDD

ODS9	Operating principle: Optical distance sensor of the 9 series
XX	Light source: L2: laser class 2 L1: laser class 1
Υ	Equipment: 8: OLED display and membrane keyboard for configuration
Z	Switching output/function OUT 1/IN: Pin 4 or black conductor: /L: IO-Link



A	Switching output / function OUT 2/IN: pin 2 or white conductor: A: Analog output 6: push-pull switching output, PNP light switching, NPN dark switching
В	Switching output / function OUT 3/IN: Pin 5: X: pin not used 6: push-pull switching output, PNP light switching, NPN dark switching K: Multifunction input (factory setting: deactivation input)
ccc	Operating range: 100: operating range 50 100 mm 200: operating range 50 200 mm 450: operating range 50 450 mm 650: operating range 50 650 mm
DDD	Electrical connection: M12: M12 connector

#### Note

A list with all available device types can be found on the Leuze electronic website at 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.

#### **WARNING! LASER RADIATION - LASER CLASS 2**

### Never look directly into the beam!

The device satisfies the requirements of IEC 60825-1:2007 (EN 60825-1:2007) safety regulations for a product of laser class 2 as well as the U.S. 21 CFR 1040.10 regulations with deviations corresponding to "Laser Notice No. 50" from June 24, 2007.

- Never look directly into the laser beam or in the direction of reflected laser beams! If you look into the beam path over a longer time
  period, there is a risk of injury to the retina.
- Do not point the laser beam of the device at persons!
- Interrupt the laser beam using a non-transparent, non-reflective object if the laser beam is accidentally directed towards a person.
- · When mounting and aligning the device, avoid reflections of the laser beam off reflective surfaces!
- CAUTION! Use of controls or adjustments or performance of procedures other than specified herein may result in hazardous light exposure.
- Observe the applicable statutory and local laser protection regulations.
- The device must not be tampered with and must not be changed in any way.
   There are no user-serviceable parts inside the device.
   Repairs must only be performed by Leuze electronic GmbH + Co. KG.

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#### NOTE

#### Affix laser information and warning signs!

Laser information and warning signs are affixed to the device. In addition, self-adhesive laser information and warning signs (stick-on labels) are supplied in several languages.

- Affix the laser information sheet to the device in the language appropriate for the place of use. When using the device in the US, use the stick-on label with the "Complies with 21 CFR 1040.10" note.
- Affix the laser information and warning signs near the device if no signs are attached to the device (e.g. because the device is too small) or if the attached laser information and warning signs are concealed due to the installation position.
- Affix the laser information and warning signs so that they are legible without exposing the reader to the laser radiation of the device or other optical radiation.

### **Accessories**

## Connection technology - Connection cables

Part no.	Designation	Article	Description
50132077	KD U-M12-5A- V1-020	Connection cable	Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin Connection 2: Open end Shielded: No Cable length: 2,000 mm Sheathing material: PVC
50132079	KD U-M12-5A- V1-050	Connection cable	Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin Connection 2: Open end Shielded: No Cable length: 5,000 mm Sheathing material: PVC

# Mounting technology - Mounting brackets

Part no.	Designation	Article	Description
50118543	BT 300M.5	Mounting bracket	Design of mounting device: Angle, L-shape Fastening, at system: Through-hole mounting Mounting bracket, at device: Screw type Type of mounting device: Adjustable Material: Stainless steel

# Mounting technology - Rod mounts

P	Part no.	Designation	Article	Description
501	)117252	BTU 300M-D12		Contains: 2x M4 x 25 screw, 2x M4 x 20 screw, 4x position washers Design of mounting device: Mounting system Fastening, 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

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	Part no.	Designation	Article	Description
50	50128380	BTU 460M-D12	Mounting system	Design of mounting device: Mounting system Fastening, at system: For 12 mm rod Mounting bracket, at device: Screw type Type of mounting device: Adjustable, Turning, 360° Material: Metal