



Figure can vary

**Part no.: 68040209**  
**MLC500T20-900-EX2**  
**Safety light curtain transmitter**



## Contents

- Technical data
- Suitable receivers
- Dimensioned drawings
- Electrical connection
- Circuit diagrams
- Operation and display
- Part number code
- Accessories
- Notes

## Technical data

| <b>Basic data</b>                  |  |
|------------------------------------|--|
| Series                             | MLC 500  |
| Device type                        | Transmitter  |
| Contains                           | 2x BT-NC sliding block                             |
| Application                        | Hand protection                                    |
| <b>Functions</b>                   |  |
| Functions                          | Transmission channel changeover<br>Range reduction |
| <b>Characteristic parameters</b>   |  |
| Type                               | 4, IEC/EN 61496                                    |
| SIL                                | 3, IEC 61508                                       |
| SILCL                              | 3, IEC/EN 62061                                    |
| Mission time $T_M$                 | 20 years, EN ISO 13849-1                           |
| <b>Protective field data</b>       |  |
| Resolution                         | 20 mm  |
| Protective field height            | 900 mm   |
| Operating range                    | 0 ... 9 m  |
| <b>Optical data</b>                |  |
| Synchronization                    | Optical between transmitter and receiver           |
| Light source                       | LED, Infrared                                      |
| LED light wavelength               | 940 nm   |
| Transmitted-signal shape           | Pulsed   |
| LED group                          | Exempt group in acc. with EN 62471:2008            |
| <b>Electrical data</b>             |  |
| Protective circuit                 | Short circuit protected<br>Overvoltage protection  |
| <b>Performance data</b>            |  |
| Supply voltage $U_B$               | 24 V, DC, -20 ... 20 %                             |
| Current consumption, max.          | 50 mA  |
| Fuse                               | 2 A semi time-lag                                  |
| <b>Inputs</b>                      |  |
| Number of digital switching inputs | 1 Piece(s)   |
| <b>Switching inputs</b>            |  |
| Type                               | Digital switching input                            |
| Switching voltage high, min.       | 18 V   |
| Switching voltage low, max.        | 2.5 V  |
| Switching voltage, typ.            | 22.5 V   |
| Voltage type                       | DC   |
| <b>Connection</b>                  |  |
| Number of connections              | 1 Piece(s)   |

**Part no.: 68040209 – MLC500T20-900-EX2 – Safety light curtain transmitter**
**Connection 1**

|                    |                   |
|--------------------|-------------------|
| Type of connection | Connector         |
| Function           | Machine interface |
| Thread size        | M12               |
| Material           | Metal             |
| No. of pins        | 5 -pin            |

**Cable properties**

|  |                      |
|--|----------------------|
| Permissible conductor cross section, typ.  | 0.25 mm <sup>2</sup> |
| Length of connection cable, max.           | 100 m                |
| Permissible cable resistance to load, max. | 200 Ω                |

**Mechanical data**

|                       |  |
|-----------------------|--|
| Dimension (W x H x L) | 30.7 mm x 966 mm x 40.3 mm   |
| Housing material      | Metal, Aluminum  |
| Lens cover material   | Plastic / PMMA   |
| Material of end caps  | Diecast zinc   |
| Net weight            | 1,050 g  |
| Housing color         | Yellow, RAL 1021   |
| Type of fastening     | Swivel mount<br>Mounting on Device Column<br>Mounting bracket<br>Groove mounting |

**Operation and display**

|                 |            |
|-----------------|------------|
| Type of display | LED        |
| Number of LEDs  | 2 Piece(s) |

**Environmental data**

|                                    |               |
|------------------------------------|---------------|
| Ambient temperature, operation     | 0 ... 55 °C   |
| Ambient temperature, storage       | -30 ... 70 °C |
| Relative humidity (non-condensing) | 0 ... 95 %    |

**Ex specification**

|                                 |  |
|---------------------------------|--|
| Ex device category              | 3G<br>3D   |
| Ex-zone                         | 2<br>22  |
| Ex device group                 | II   |
| Permissible surface temperature | T<85° (T4) °C  |
| Ignition protection type        | "nA" non-sparking<br>"tc" protection through housing |


**Certifications**

|                      |                          |
|----------------------|--------------------------|
| Degree of protection | IP 65                    |
| Protection class     | III                      |
| Certifications       | TÜV Süd<br>c TÜV NRTL US |
| Vibration resistance | 50 m/s <sup>2</sup>      |
| Shock resistance     | 100 m/s <sup>2</sup>     |
| US patents           | US 6,418,546 B           |

**Classification**

|            |          |
|------------|----------|
| eCl@ss 8.0 | 27272704 |
| eCl@ss 9.0 | 27272704 |
| ETIM 5.0   | EC002549 |

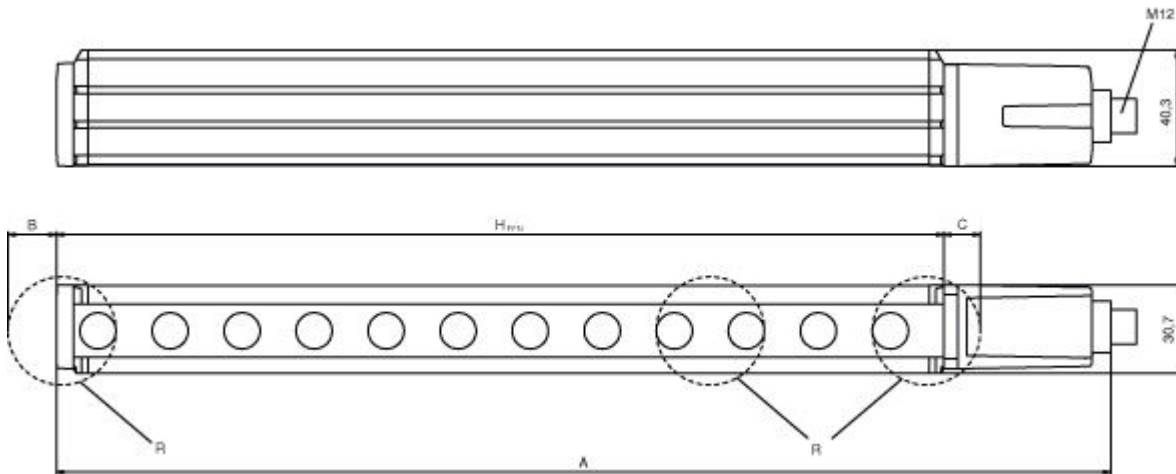
### Suitable receivers

|   | Part no. | Designation       | Article                       | Description   |
|---|----------|-------------------|-------------------------------|---|
|  | 68042209 | MLC520R20-900-EX2 | Safety light curtain receiver | Resolution: 20 mm<br>Protective field height: 900 mm<br>Response time: 17 ms<br>Connection: Connector, M12, Metal, 8 -pin<br>Function package: Standard |

### Dimensioned drawings

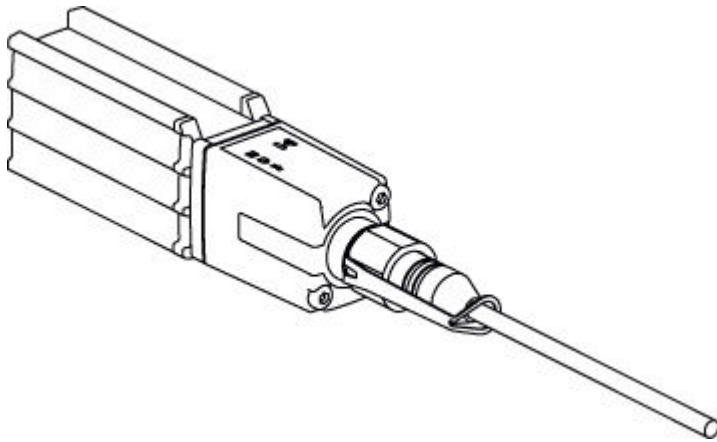
All dimensions in millimeters

Calculation of the effective protective field height  $HPFE = HPFN + B + C$



- HPFE Effective protective field height = 917 mm
- HPFN Nominal protective field height = 900 mm
- A Total height = 516 mm
- B 7 mm
- C 10 mm
- R Effective protective field height HPFE goes beyond the dimensions of the optics area to the outer borders of the circles labeled with R.

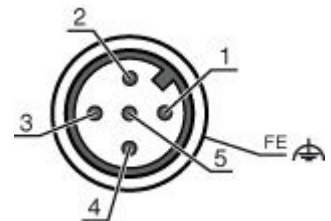
K-VM12-Ex interlocking guard



**Electrical connection**

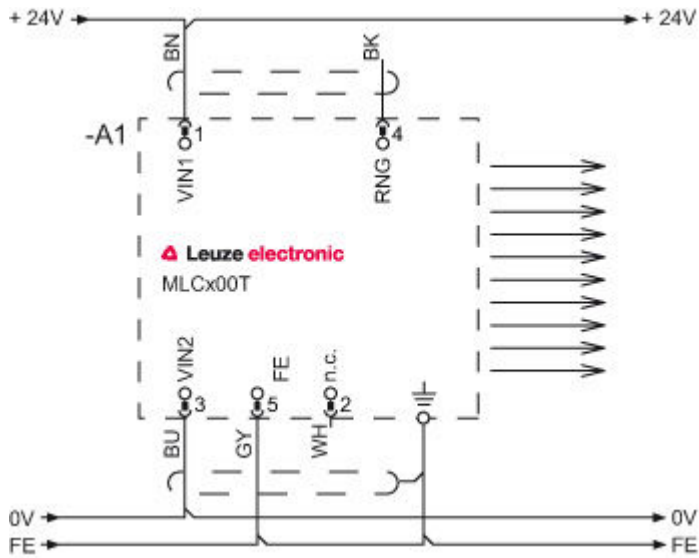
| Connection 1       |                   |
|--------------------|-------------------|
| Type of connection | Connector         |
| Function           | Machine interface |
| Thread size        | M12               |
| Type               | Male              |
| Material           | Metal             |
| No. of pins        | 5 -pin            |
| Encoding           | A-coded           |
| Connector housing  | FE/SHIELD         |

| Pin | Pin assignment | Conductor color |
|-----|----------------|-----------------|
| 1   | VIN1           | Brown           |
| 2   | n.c.           | White           |
| 3   | VIN2           | Blue            |
| 4   | RNG            | Black           |
| 5   | FE/SHIELD      | Gray            |



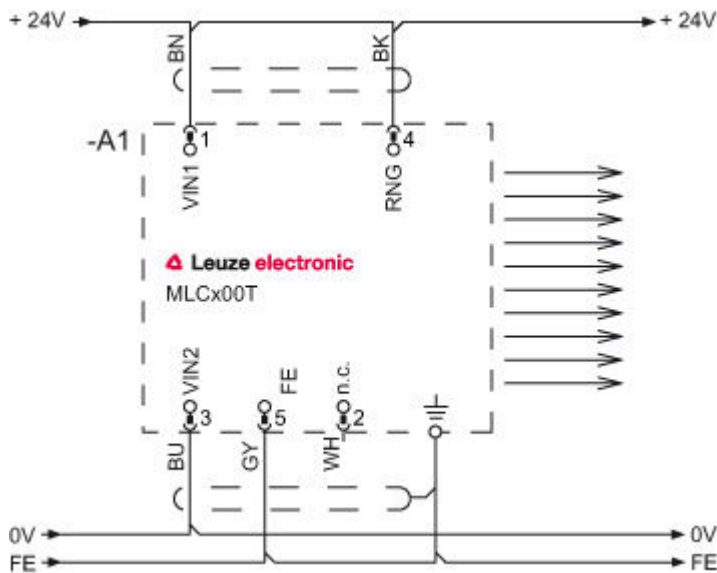
**Circuit diagrams**

Transmission channel C1, reduced range



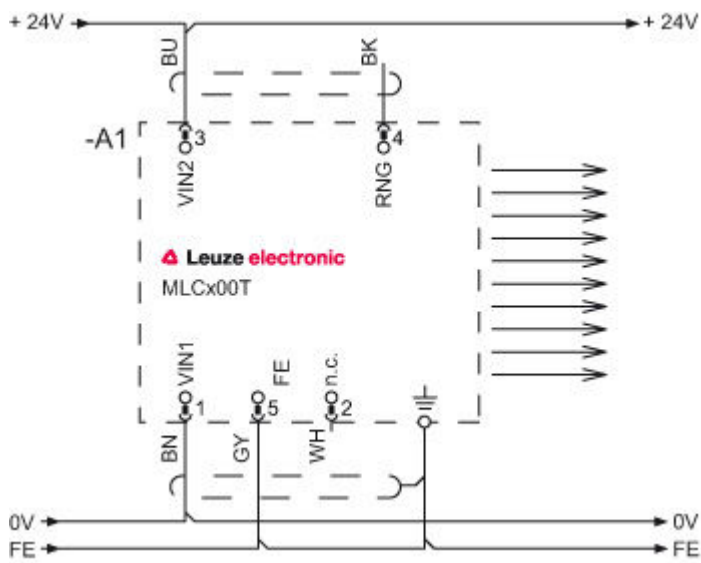
- 1 VIN1 = +24 V
- 3 VIN2 = 0 V
- 4 RNG = 0 V or open

Transmission channel C1, standard range



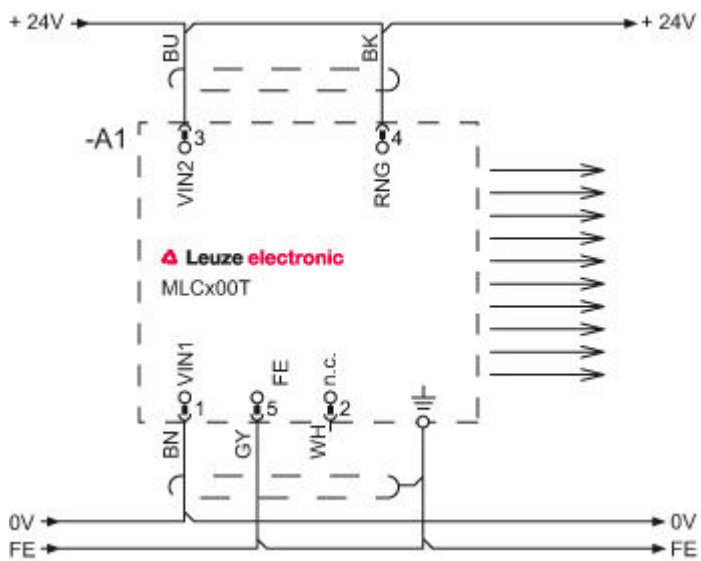
- 1 VIN1 = +24 V
- 3 VIN2 = 0 V
- 4 RNG = +24 V

Transmission channel C2, reduced range



- 1 VIN1 = 0 V
- 3 VIN2 = +24 V
- 4 RNG = 0 V or open

Transmission channel C2, standard range



- 1 VIN1 = 0 V
- 3 VIN2 = +24 V
- 4 RNG = +24 V

## Operation and display

### LEDs

| LED | Display                                       | Meaning                                       |
|-----|---|---|
| 1   | Off   | Device switched off                           |
|     | Red, continuous light                         | Device error                                  |
|     | Green, continuous light                       | Normal operation                              |
| 2   | Green, flashing, 10 s long after switching on | Reduced range selected by the wiring of pin 4 |
|     | Off   | Transmission channel C1                       |
|     | Green, continuous light                       | Transmission channel C2                       |

## Part number code

Part designation: **MLCxyy-za-hhhhei-ooo**

| MLC | Safety light curtain   |
|-----|--|
| x   | <b>Series:</b><br>3: MLC 300<br>5: MLC 500   |
| yy  | <b>Function classes:</b><br>00: Transmitter<br>01: transmitter (AIDA)<br>02: Transmitter with test input<br>10: Basic receiver - automatic restart<br>11: basic receiver - automatic restart (AIDA)<br>20: Standard receiver - EDM/RES selectable<br>30: Extended receiver - blanking/muting |
| z   | <b>Device type:</b><br>T: transmitter<br>R: receiver   |
| a   | <b>Resolution:</b><br>14: 14 mm<br>20: 20 mm<br>30: 30 mm<br>40: 40 mm<br>90: 90 mm  |
| hhh | <b>Protective field height:</b><br>150 ... 3000: from 150 mm to 3000 mm  |
| e   | <b>Host/Guest (optional):</b><br>H: Host<br>MG: Middle Guest<br>G: Guest   |
| i   | <b>Interface (optional):</b><br>/A: AS-i   |
| ooo | <b>Option:</b><br>/V: high Vibration-proof<br>EX2: explosion protection (zones 2 + 22)<br>SPG: Smart Process Gating  |




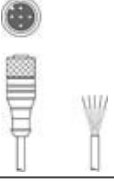
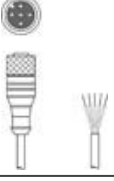




### Note

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




**Accessories**


## Connection technology - Connection cables

|   | Part no. | Designation        | Article          | Description   |
|---|----------|--------------------|------------------|---|
|    | 429088   | CB-M12-15000-5GF   | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 15,000 mm<br>Sheathing material: PUR  |
|    | 429089   | CB-M12-25000-5GF   | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 25,000 mm<br>Sheathing material: PUR  |
|    | 678058   | CB-M12-25000E-5GF  | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 25,000 mm<br>Sheathing material: PUR |
|   | 429281   | CB-M12-50000-5GF   | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 50,000 mm<br>Sheathing material: PUR  |
|  | 50133860 | KD S-M12-5A-P1-050 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 5,000 mm<br>Sheathing material: PUR  |
|  | 50133861 | KD S-M12-5A-P1-100 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 10,000 mm<br>Sheathing material: PUR |
|  | 50137014 | KD S-M12-5A-P1-150 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 10,000 mm<br>Sheathing material: PVC |
|  | 50137013 | KD S-M12-5A-P1-500 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 10,000 mm<br>Sheathing material: PVC |
|  | 50133841 | KD U-M12-5A-P1-050 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 5,000 mm<br>Sheathing material: PUR   |



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|   | Part no. | Designation        | Article          | Description  |
|---|----------|--------------------|------------------|--|
|  | 50132534 | KD U-M12-5A-P1-100 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 10,000 mm<br>Sheathing material: PUR |



### Connection technology - Connectors

|   | Part no. | Designation | Article   | Description  |
|---|----------|-------------|-----------|--|
|  | 429175   | CB-M12-5GF  | Connector | Connection: Connector, M12, Axial, Female, A-coded, 5 -pin |


### Mounting technology - Mounting brackets

|   | Part no. | Designation | Article              | Description  |
|---|----------|-------------|----------------------|--|
|   | 429056   | BT-2L       | Mounting bracket set | Design of mounting device: Angle, L-shape<br>Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Screw type<br>Material: Metal |
|  | 429057   | BT-2Z       | Mounting bracket set | Design of mounting device: Angle, Z-shape<br>Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Screw type<br>Material: Metal |






### Mounting technology - Swivel mounts

|   | Part no. | Designation | Article              | Description   |
|---|----------|-------------|----------------------|---|
|  | 429393   | BT-2HF      | Mounting bracket set | Contains: 2x BT-HF swivel mount, 1 cylinder for mounting on the light curtain<br>Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable<br>Type of mounting device: Turning, 360°<br>Material: Metal, Plastic                        |
|  | 429394   | BT-2HF-S    | Mounting bracket set | Contains: 2x BT-HF swivel mount, 1 cylinder for mounting on the light curtain<br>Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable<br>Type of mounting device: Turning, 360°<br>Material: Metal, Plastic<br>Shock absorber: Yes |





### Mounting technology - Other

|   | Part no. | Designation | Article           | Description   |
|---|----------|-------------|-------------------|---|
|  | 425740   | BT-10NC60   | Sliding block set | Contains: 10x BT-NC sliding block<br>Bore hole 1: Ø 4.7 mm<br>Bore hole 2: M6<br>Design of mounting device: Sliding block<br>Fastening, at system: Mounting thread<br>Mounting bracket, at device: Groove mounting<br>Material: Metal |


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|  | Part no. | Designation | Article              | Description  |
|--|----------|-------------|----------------------|--|
|   | 425741   | BT-10NC64   | Sliding block set    | Contains: 10x BT-NC-M4-M6 sliding block<br>Bore hole 1: M4<br>Bore hole 2: M6<br>Design of mounting device: Sliding block<br>Fastening, at system: Mounting thread<br>Mounting bracket, at device: Groove mounting<br>Material: Metal                                    |
|   | 425742   | BT-10NC65   | Sliding block set    | Contains: 10x BT-NC-M5-M6 sliding block<br>Bore hole 1: M5<br>Bore hole 2: M6<br>Design of mounting device: Sliding block<br>Fastening, at system: Mounting thread<br>Mounting bracket, at device: Groove mounting<br>Material: Metal                                    |
|   | 424417   | BT-2P40     | Mounting bracket set | Contains: 2x BT-P40 clamp bracket<br>Design of mounting device: Mounting clamp<br>Fastening, at system: Groove mounting<br>Mounting bracket, at device: Groove mounting<br>Type of mounting device: Clampable<br>Material: Metal   |
|   | 424422   | BT-2SB10    | Mounting bracket set | Contains: 2x BT-SB10<br>Design of mounting device: Mounting clamp<br>Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable, On the lateral C-groove<br>Type of mounting device: Swiveling<br>Swivel range: -8 ... 8 °<br>Material: Metal |
|  | 424423   | BT-2SB10-S  | Mounting bracket set | Contains: 2x BT-SB10-S<br>Design of mounting device: Mounting clamp<br>Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable, On the lateral C-groove<br>Swivel range: -8 ... 8 °<br>Material: Metal<br>Shock absorber: Yes              |

**Alignment aids**

|   | Part no. | Designation | Article       | Description   |
|---|----------|-------------|---------------|---|
|  | 427300   | AC-ALM      | Alignment aid | Housing material: Plastic                           |
|  | 520101   | AC-ALM-M    | Alignment aid | Housing material: Plastic                           |
|  | 560020   | LA-78U      | Alignment aid | Light source: laser, Red<br>Housing material: Metal |
|  | 520004   | LA-78UDC    | Alignment aid | Light source: laser, Red<br>Housing material: Metal |


## Deflecting mirror

|   | Part no. | Designation | Article           | Description   |
|---|----------|-------------|-------------------|---|
|  | 529609   | UM60-900    | Deflecting mirror | Dimensions: 25 mm x 970 mm x 68 mm<br>Protected field height up to: 900 mm<br>Mirror length: 960 mm |

## Device columns

|   | Part no. | Designation | Article       | Description  |
|---|----------|-------------|---------------|--|
|    | 549852   | UDC-1300-S2 | Device column | Dimensions: 160 mm x 1,360 mm x 149 mm<br>Column height without foot: 1,300 mm<br>Functions: Mounting and protection of light curtains and multiple light beam devices, Adjustable, 3 directions |
|   | 549853   | UDC-1600-S2 | Device column | Dimensions: 160 mm x 1,660 mm x 149 mm<br>Column height without foot: 1,600 mm<br>Functions: Mounting and protection of light curtains and multiple light beam devices, Adjustable, 3 directions |
|  | 549854   | UDC-1900-S2 | Device column | Dimensions: 160 mm x 1,960 mm x 149 mm<br>Column height without foot: 1,900 mm<br>Functions: Mounting and protection of light curtains and multiple light beam devices, Adjustable, 3 directions |
|  | 549867   | UDC-2100-S2 | Device column | Dimensions: 160 mm x 2,160 mm x 149 mm<br>Column height without foot: 2,100 mm<br>Functions: Adjustable, 3 directions, Mounting and protection of light curtains and multiple light beam devices |
|  | 549857   | UDC-2500-S2 | Device column | Dimensions: 160 mm x 2,560 mm x 149 mm<br>Column height without foot: 2,500 mm<br>Functions: Adjustable, 3 directions, Mounting and protection of light curtains and multiple light beam devices |
|  | 549865   | UDC-3100-S2 | Device column | Dimensions: 160 mm x 3,160 mm x 149 mm<br>Column height without foot: 3,100 mm<br>Functions: Mounting and protection of light curtains and multiple light beam devices, Adjustable, 3 directions |

## General

|   | Part no. | Designation | Article               | Description                   |
|---|----------|-------------|-----------------------|-------------------------------|
|  | 50109217 | K-V M12-Ex  | Safety locking device | Housing material: Plastic, PA |

## Notes

### Observe intended use!

- The product may only be put into operation by competent persons.
- Only use the product in accordance with its intended use.