



Figure can vary

**Part no.: 66563600**

**MLD530-XR3**

**Multiple light beam safety device receiver**



## Contents

- Technical data
- Suitable transmitters
- Dimensioned drawings
- Electrical connection
- Operation and display
- Part number code
- Accessories

## Part no.: 66563600 – MLD530-XR3 – Multiple light beam safety device receiver

### Technical data

| <b>Basic data</b>                |  |
|----------------------------------|--|
| Series                           | MLD 500  |
| Device type                      | Receiver   |
| <b>Functions</b>                 |  |
| Functions                        | Muting enable function<br>Alternative connection for second muting signal<br>Timing controlled 2-sensor muting<br>Start/restart interlock (RES)<br>Contactor monitoring (EDM), selectable<br>Muting-timeout extension<br>Sequence controlled 2-sensor muting<br>Partial muting |
| <b>Characteristic parameters</b> |  |
| Type                             | 4, IEC/EN 61496  |
| SIL                              | 3, IEC 61508   |
| SILCL                            | 3, IEC/EN 62061  |
| Performance Level (PL)           | e, EN ISO 13849-1  |
| MTTF <sub>d</sub>                | 204 years, EN ISO 13849-1  |
| PFH <sub>D</sub>                 | 6.6E-09 per hour   |
| Mission time T <sub>M</sub>      | 20 years, EN ISO 13849-1   |
| Category                         | 4, EN ISO 13849  |
| <b>Optical data</b>              |  |
| Number of beams                  | 3 Piece(s)   |
| Beam spacing                     | 400 mm   |
| <b>Electrical data</b>           |  |
| Selection of operating mode      | Connection 1, pin 7: 0 V for operating mode 1, 2, 4<br>Connection 1, pin 2: +24 V for operating mode 1, 2, 4<br>Connection 1, pin 7: +24 V for operating mode 3, 5, 6<br>Connection 1, pin 2: 0 V for operating mode 3, 5, 6   |
| Protective circuit               | Short circuit protected<br>Overvoltage protection  |
| <b>Performance data</b>          |  |
| Supply voltage                   | 24 V, DC, -20 ... 20 %   |
| Current consumption, max.        | 150 mA, Without external load  |
| Fuse                             | External with max. 3 A   |

**Part no.: 66563600 – MLD530-XR3 – Multiple light beam safety device receiver****Inputs**

|                                    |            |
|------------------------------------|------------|
| Number of digital switching inputs | 4 Piece(s) |
|------------------------------------|------------|

**Switching inputs**

|      |                         |
|------|-------------------------|
| Type | Digital switching input |
|------|-------------------------|

|                              |        |
|------------------------------|--------|
| Switching voltage high, min. | 18.2 V |
|------------------------------|--------|

|                             |       |
|-----------------------------|-------|
| Switching voltage low, max. | 2.5 V |
|-----------------------------|-------|

|                         |      |
|-------------------------|------|
| Switching voltage, typ. | 23 V |
|-------------------------|------|

|              |    |
|--------------|----|
| Voltage type | DC |
|--------------|----|

|                         |      |
|-------------------------|------|
| Switching current, max. | 5 mA |
|-------------------------|------|

**Digital switching input 1**

|            |                     |
|------------|---------------------|
| Assignment | Connection 1, pin 1 |
|------------|---------------------|

|          |   |
|----------|---|
| Function | Control input for start/restart interlock (RES) |
|----------|---|

**Digital switching input 2**

|            |                     |
|------------|---------------------|
| Assignment | Connection 1, pin 3 |
|------------|---------------------|

|          |  |
|----------|--|
| Function | Control input for contactor monitoring (EDM) |
|----------|--|

**Digital switching input 3**

|            |                     |
|------------|---------------------|
| Assignment | Connection 1, pin 4 |
|------------|---------------------|

|          |                                     |
|----------|-------------------------------------|
| Function | Control input, second muting signal |
|----------|-------------------------------------|

**Digital switching input 4**

|            |                     |
|------------|---------------------|
| Assignment | Connection 1, pin 8 |
|------------|---------------------|

|          |                                       |
|----------|---------------------------------------|
| Function | Control input, muting enable/ timeout |
|----------|---------------------------------------|

# Part no.: 66563600 – MLD530-XR3 – Multiple light beam safety device receiver

## Outputs

|  |            |
|--|------------|
| Number of safety-related switching outputs (OSSDs) | 2 Piece(s) |
| Number of digital switching outputs                | 1 Piece(s) |

### Safety-related switching outputs

|                              |                                      |
|------------------------------|--------------------------------------|
| Type                         | Safety-related switching output OSSD |
| Switching voltage high, min. | 18.2 V                               |
| Switching voltage low, max.  | 2.5 V                                |
| Switching voltage, typ.      | 23 V                                 |
| Voltage type                 | DC                                   |
| Current load, max.           | 380 mA                               |
| Load inductivity             | 2,200,000 µH                         |
| Load capacity                | 0.3 µF                               |
| Residual current, max.       | 0.2 mA                               |
| Residual current, typ.       | 0.002 mA                             |
| Voltage drop                 | 1 V                                  |

### Safety-related switching output 1

|                   |                     |
|-------------------|---------------------|
| Assignment        | Connection 1, pin 6 |
| Switching element | Transistor, PNP     |

### Safety-related switching output 2

|                   |                     |
|-------------------|---------------------|
| Assignment        | Connection 1, pin 5 |
| Switching element | Transistor, PNP     |

### Switching outputs

|                              |                          |
|------------------------------|--------------------------|
| Type                         | Digital switching output |
| Switching voltage high, min. | 18.2 V                   |
| Switching voltage low, max.  | 2.5 V                    |
| Switching voltage, typ.      | 23 V                     |
| Voltage type                 | DC                       |

### Switching output 1

|                   |                                |
|-------------------|--------------------------------|
| Assignment        | Connection 1, pin 1            |
| Switching element | Transistor, PNP                |
| Function          | "State of OSSDs" signal output |

## Timing

|                    |        |
|--------------------|--------|
| Response time      | 50 ms  |
| Restart delay time | 100 ms |

## Connection

|                       |            |
|-----------------------|------------|
| Number of connections | 2 Piece(s) |
|-----------------------|------------|

### Connection 1

|                    |                   |
|--------------------|-------------------|
| Type of connection | Connector         |
| Function           | Machine interface |
| Thread size        | M12               |
| Material           | Metal             |
| No. of pins        | 8 -pin            |

### Connection 2

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

## Part no.: 66563600 – MLD530-XR3 – Multiple light beam safety device receiver

### 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) | 52 mm x 900 mm x 64.7 mm        |
| Housing material      | Metal, Aluminum                 |
| Lens cover material   | Plastic / PMMA                  |
| Material of end caps  | Diecast zinc                    |
| Net weight            | 2,000 g                         |
| Housing color         | Yellow, RAL 1021                |
| Type of fastening     | Groove mounting<br>Swivel mount |

### Operation and display

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

### Environmental data

|                                    |               |
|------------------------------------|---------------|
| Ambient temperature, operation     | -30 ... 55 °C |
| Ambient temperature, storage       | -40 ... 75 °C |
| Relative humidity (non-condensing) | 0 ... 95 %    |


### Certifications

|                      |                                      |
|----------------------|--------------------------------------|
| Degree of protection | IP 67                                |
| Protection class     | III                                  |
| Certifications       | c TÜV NRTL US<br>c CSA US<br>TÜV Süd |
| US patents           | US 6,418,546 B<br>US 7,741,595 B     |

### Classification

|            |          |
|------------|----------|
| eCl@ss 8.0 | 27272703 |
| eCl@ss 9.0 | 27272703 |
| ETIM 5.0   | EC001832 |

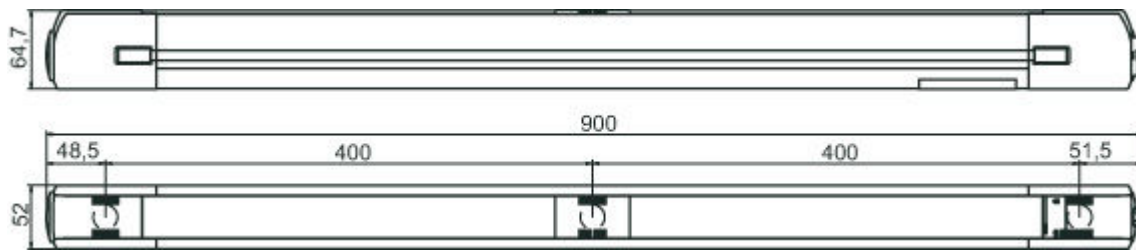
## Suitable transmitters

|   | Part no. | Designation | Article                                       | Description  |
|---|----------|-------------|---|--|
|  | 66501600 | MLD500-XT3  | Multiple light beam safety device transmitter | Operating range: 20 ... 70 m<br>Number of beams: 3 Piece(s)<br>Beam spacing: 400 mm<br>Connection: Connector, M12, Metal, 5 -pin |

Part no.: 66563600 – MLD530-XR3 – Multiple light beam safety device receiver

## Dimensioned drawings

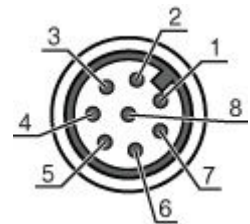
All dimensions in millimeters



## Electrical connection

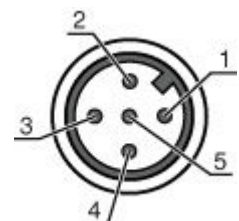
| Connection 1       |                   |
|--------------------|-------------------|
| Type of connection | Connector         |
| Function           | Machine interface |
| Thread size        | M12               |
| Type               | Male              |
| Material           | Metal             |
| No. of pins        | 8 -pin            |
| Encoding           | A-coded           |

| Pin | Pin assignment         | Conductor color |
|-----|------------------------|-----------------|
| 1   | RES/OSSD status signal | White           |
| 2   | VIN                    | Brown           |
| 3   | EDM                    | Green           |
| 4   | MS2                    | Yellow          |
| 5   | OSSD2                  | Gray            |
| 6   | OSSD1                  | Pink            |
| 7   | VIN                    | Blue            |
| 8   | M-EN/TO                | Red             |



| Connection 2       |                 |
|--------------------|-----------------|
| Type of connection | Connector       |
| Function           | Local interface |
| Thread size        | M12             |
| Type               | Female          |
| Material           | Metal           |
| No. of pins        | 5 -pin          |
| Encoding           | A-coded         |

| Pin | Pin assignment | Conductor color |
|-----|----------------|-----------------|
| 1   | +24V           | Brown           |
| 2   | MS2            | White           |
| 3   | 0 V            | Blue            |
| 4   | MS1            | Black           |
| 5   | RES/LMP        | Gray            |



Part no.: 66563600 – MLD530-XR3 – Multiple light beam safety device receiver

## Operation and display

### LEDs

| LED | Display                  | Meaning  |
|-----|--------------------------|--|
| 1   | Red, continuous light    | OSSD off.  |
|     | Green, continuous light  | OSSD on  |
|     | Red, flashing, 1 Hz      | External error                                       |
|     | Red, flashing, 10 Hz     | Internal error                                       |
|     | Green, flashing, 1 Hz    | Weak signal, device not optimally aligned or soiled. |
| 2   | Yellow, continuous light | Start/restart interlock locked.                      |


## Part number code

Part designation: **MLDxyy-zab/t**

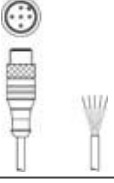


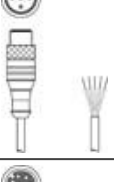

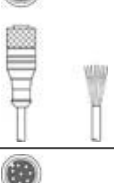
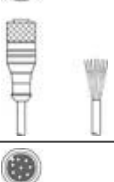
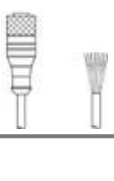
| MLD | Multiple light beam safety device  |
|-----|--|
| x   | <b>Series:</b><br>3: MLD 300<br>5: MLD 500   |
| yy  | <b>Function classes:</b><br>00: Transmitter<br>10: automatic restart<br>12: external testing<br>20: EDM/RES<br>30: muting<br>35: timing controlled 4-sensor muting   |
| z   | <b>Device type:</b><br>T: transmitter<br>R: receiver<br>RT: transceiver<br>xT: transmitter with high range<br>xR: receiver for high range  |
| a   | Number of beams  |
| b   | <b>Option:</b><br>L: integrated laser alignment aid (for transmitter/receiver)<br>M: integrated status indicator (MLD 320, MLD 520) or integrated status and muting indicator (MLD 330, MLD 335, MLD 510/A, MLD 530, MLD 535)<br>E: connection socket for external muting indicator (AS-i models only) |
| /t  | <b>Safety-related switching outputs (OSSDs), connection technology:</b><br>-: transistor output, M12 plug<br>A: integrated AS-i interface, M12 plug, (safety bus system)   |

## Accessories


### Connection technology - Connection cables

|   | Part no. | Designation       | Article          | Description   |
|---|----------|-------------------|------------------|---|
|  | 678051   | CB-M12-10000E-5GM | Connection cable | Connection 1: Connector, M12, Axial, Male, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 10,000 mm<br>Sheathing material: PUR |

## Part no.: 66563600 – MLD530-XR3 – Multiple light beam safety device receiver




|   | Part no. | Designation        | Article          | Description   |
|---|----------|--------------------|------------------|---|
|    | 678052   | CB-M12-15000E-5GM  | Connection cable | Connection 1: Connector, M12, Axial, Male, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 15,000 mm<br>Sheathing material: PUR   |
|    | 678053   | CB-M12-25000E-5GM  | Connection cable | Connection 1: Connector, M12, Axial, Male, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 25,000 mm<br>Sheathing material: PUR   |
|    | 678064   | CB-M12-50000E-8GF  | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 8 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 50,000 mm<br>Sheathing material: PUR |
|   | 678050   | CB-M12-5000E-5GM   | Connection cable | Connection 1: Connector, M12, Axial, Male, A-coded, 5 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 5,000 mm<br>Sheathing material: PUR    |
|  | 50135128 | KD S-M12-8A-P1-050 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 8 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 5,000 mm<br>Sheathing material: PUR  |
|  | 50135129 | KD S-M12-8A-P1-100 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 8 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 10,000 mm<br>Sheathing material: PUR |
|  | 50135130 | KD S-M12-8A-P1-150 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 8 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 15,000 mm<br>Sheathing material: PUR |
|  | 50135131 | KD S-M12-8A-P1-250 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 8 -pin<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 25,000 mm<br>Sheathing material: PUR |

## Mounting technology - Swivel mounts


|   | Part no. | Designation  | Article              | Description   |
|---|----------|--------------|----------------------|---|
|  | 560340   | BT-SET-240BC | Mounting bracket set | Mounting bracket, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable<br>Type of mounting device: Turning, 240°<br>Material: Metal |




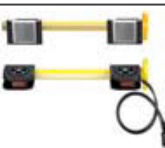
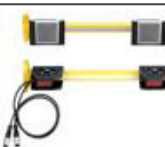


## Part no.: 66563600 – MLD530-XR3 – Multiple light beam safety device receiver

|   | Part no. | Designation     | Article              | Description   |
|---|----------|-----------------|----------------------|---|
|  | 540350   | BT-SET-240BC-E  | Mounting bracket set | Mounting bracket, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable<br>Type of mounting device: Turning, 240°<br>Material: Metal, Plastic  |
|  | 560342   | BT-SET-240BCS   | Mounting bracket set | Mounting bracket, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable<br>Type of mounting device: Turning, 240°, Shock absorber<br>Material: Metal<br>Shock absorber: Yes          |
|  | 540352   | BT-SET-240BCS-E | Mounting bracket set | Mounting bracket, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable<br>Type of mounting device: Shock absorber, Turning, 240°<br>Material: Metal, Plastic<br>Shock absorber: Yes |





## Mounting technology - Other

|  | Part no. | Designation | Article              | Description   |
|--|----------|-------------|----------------------|---|
|  | 424417   | BT-2P40     | Mounting bracket set | Contains: 2x BT-P40 clamp bracket<br>Design of mounting device: Mounting clamp<br>Mounting bracket, at system: Groove mounting<br>Mounting bracket, at device: Groove mounting<br>Type of mounting device: Clampable<br>Material: Metal |




## Muting - Mounting systems

|   | Part no. | Designation      | Article           | Description  |
|---|----------|------------------|-------------------|--|
|  | 426490   | Set-AC-ML-2SA    | Muting sensor set | Operating range: 0 ... 4 m<br>Cable length of muting sensors: 300 mm<br>Type of muting sensors: Retro-reflective photoelectric sensors PRK 3B<br>Number of muting sensors: 2 Piece(s)<br>Number of reflectors: 2 Piece(s)    |
|  | 426491   | Set-AC-ML-2SB    | Muting sensor set | Operating range: 0 ... 4 m<br>Cable length of muting sensors: 300 mm<br>Type of muting sensors: Retro-reflective photoelectric sensors PRK 3B<br>Number of muting sensors: 2 Piece(s)<br>Number of reflectors: 2 Piece(s)    |
|  | 426520   | Set-AC-MLX-2SA   | Muting sensor set | Operating range: 0 ... 8 m<br>Cable length of muting sensors: 700 mm<br>Type of muting sensors: PRK 25B retro-reflective photoelectric sensors<br>Number of muting sensors: 2 Piece(s)<br>Number of reflectors: 2 Piece(s)   |
|  | 426521   | Set-AC-MLX-2SB   | Muting sensor set | Operating range: 0 ... 8 m<br>Cable length of muting sensors: 700 mm<br>Type of muting sensors: PRK 25B retro-reflective photoelectric sensors<br>Number of muting sensors: 2 Piece(s)<br>Number of reflectors: 2 Piece(s)   |
|  | 426526   | Set-AC-MLX.2-2SA | Muting sensor set | Operating range: 0 ... 8 m<br>Cable length of muting sensors: 2,000 mm<br>Type of muting sensors: PRK 25B retro-reflective photoelectric sensors<br>Number of muting sensors: 2 Piece(s)<br>Number of reflectors: 2 Piece(s) |


## Part no.: 66563600 – MLD530-XR3 – Multiple light beam safety device receiver

|   | Part no. | Designation      | Article           | Description  |
|---|----------|------------------|-------------------|--|
|  | 426527   | Set-AC-MLX.2-2SB | Muting sensor set | Operating range: 0 ... 8 m<br>Cable length of muting sensors: 2,000 mm<br>Type of muting sensors: PRK 25B retro-reflective photoelectric sensors<br>Number of muting sensors: 2 Piece(s)<br>Number of reflectors: 2 Piece(s) |
|  | 426494   | Set-AC-MT-2S     | Muting sensor set | Operating range: 0 ... 4 m<br>Cable length of muting sensors: 300 mm<br>Type of muting sensors: Retro-reflective photoelectric sensors PRK 3B<br>Number of muting sensors: 2 Piece(s)<br>Number of reflectors: 2 Piece(s)    |
|  | 426524   | Set-AC-MTX-2S    | Muting sensor set | Operating range: 0 ... 8 m<br>Cable length of muting sensors: 300 mm<br>Type of muting sensors: PRK 25B retro-reflective photoelectric sensors<br>Number of muting sensors: 2 Piece(s)<br>Number of reflectors: 2 Piece(s)   |
|  | 426529   | Set-AC-MTX.2-2S  | Muting sensor set | Operating range: 0 ... 8 m<br>Cable length of muting sensors: 2,000 mm<br>Type of muting sensors: PRK 25B retro-reflective photoelectric sensors<br>Number of muting sensors: 2 Piece(s)<br>Number of reflectors: 2 Piece(s) |

## Muting - Connection technology








|   | Part no. | Designation   | Article                  | Description  |
|---|----------|---------------|--------------------------|--|
|  | 520150   | AC-SCM5U      | Sensor connection module | Suitable for: MLD 330, MLD 530 multiple light beam safety devices<br>Supply voltage: 24 V, DC, -20 ... 20 %<br>Number of connections: 5 Piece(s)<br>Connection: Cable with connector, M12, 500 mm<br>Type of fastening: Through-hole mounting                        |
|  | 520151   | AC-SCM5U-BT   | Sensor connection module | Suitable for: MLD 330, MLD 530 multiple light beam safety devices<br>Supply voltage: 24 V, DC, -20 ... 20 %<br>Number of connections: 5 Piece(s)<br>Connection: Cable with connector, M12, 500 mm<br>Type of fastening: Mounting plate, Groove mounting              |
|  | 520152   | AC-SCM5U-BT-L | Sensor connection module | Suitable for: MLD 330, MLD 530 multiple light beam safety devices<br>Supply voltage: 24 V, DC, -20 ... 20 %<br>Number of connections: 5 Piece(s)<br>Connection: Cable with connector, M12, 500 mm<br>Type of fastening: Mounting plate with L-angle, Groove mounting |

## Display/operating elements

|   | Part no. | Designation | Article             | Description  |
|---|----------|-------------|---------------------|--|
|  | 426296   | AC-ABF70    | Acknowledgment unit | Switching current via button: 1 ... 1,000 mA<br>Housing material: Glass fiber reinforced (PPS), self-extinguishing<br>Clamping plate material: Stainless steel<br>Degree of protection: IP 67, IP 69K<br>Functions: Reset of the start/restart interlock, Overriding with AOPDs with muting function, Illuminated reset buttons<br>Reset buttons: Yes<br>LED indicators: Yes |

# Part no.: 66563600 – MLD530-XR3 – Multiple light beam safety device receiver

## Device columns

|   | Part no. | Designation | Article       | Description  |
|---|----------|-------------|---------------|--|
|    | 549879   | UDC-1140-S2 | Device column | Dimensions: 160 mm x 1,200 mm x 149 mm<br>Column height without foot: 1,140 mm<br>Functions: Adjustable, 3 directions, Mounting and protection of light curtains and multiple light beam devices |
|    | 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 |