



Figure can vary

**Part no.: 68042210**  
**MLC520R20-1050-EX2**  
**Safety light curtain receiver**



## Contents

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

## Technical data

| <b>Basic data</b>                  |                                                                                               |
|------------------------------------|-----------------------------------------------------------------------------------------------|
| Series                             | MLC 500                                                                                       |
| Device type                        | Receiver                                                                                      |
| Contains                           | 2x BT-NC sliding block                                                                        |
| Application                        | Hand protection                                                                               |
| <b>Functions</b>                   |                                                                                               |
| Function package                   | Standard                                                                                      |
| Functions                          | Contactormonitoring (EDM)<br>Start/restart interlock (RES)<br>Transmission channel changeover |
| <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                                                                            |
| PFH <sub>D</sub>                   | 7.73E-09 per hour                                                                             |
| Mission time T <sub>M</sub>        | 20 years , EN ISO 13849-1                                                                     |
| Category                           | 4 , EN ISO 13849                                                                              |
| <b>Protective field data</b>       |                                                                                               |
| Resolution                         | 20 mm                                                                                         |
| Protective field height            | 1,050 mm                                                                                      |
| <b>Optical data</b>                |                                                                                               |
| Synchronization                    | Optical between transmitter and receiver                                                      |
| <b>Electrical data</b>             |                                                                                               |
| Protective circuit                 | Overvoltage protection<br>Short circuit protected                                             |
| <b>Performance data</b>            |                                                                                               |
| Supply voltage U <sub>B</sub>      | 24 V , DC , -20 ... 20 %                                                                      |
| Current consumption, max.          | 150 mA                                                                                        |
| Fuse                               | 2 A semi time-lag                                                                             |
| <b>Inputs</b>                      |                                                                                               |
| Number of digital switching inputs | 3 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                                                                                            |

**Outputs**

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

**Safety-related switching outputs**

|                              |                                      |
|------------------------------|--------------------------------------|
| Type                         | Safety-related switching output OSSD |
| Switching voltage high, min. | 18 V                                 |
| Switching voltage low, max.  | 2.5 V                                |
| Switching voltage, typ.      | 22.5 V                               |
| Voltage type                 | DC                                   |
| Current load, max.           | 380 mA                               |
| Load inductivity             | 2,000 µH                             |
| Load capacity                | 0.3 µF                               |
| Residual current, max.       | 0.2 mA                               |
| Residual current, typ.       | 0.002 mA                             |
| Voltage drop                 | 1.5 V                                |

**Safety-related switching output 1**

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

**Safety-related switching output 2**

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

**Timing**

|                    |        |
|--------------------|--------|
| Response time      | 19 ms  |
| Restart delay time | 100 ms |

**Connection**

Number of connections 1 Piece(s)

**Connection 1**

|                    |                   |
|--------------------|-------------------|
| Type of connection | Connector         |
| Function           | Machine interface |
| Thread size        | M12               |
| Material           | Metal             |
| No. of pins        | 8 -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 1,116 mm x 40.3 mm                                                     |
| Housing material      | Metal , Aluminum                                                                 |
| Lens cover material   | Plastic / PMMA                                                                   |
| Material of end caps  | Diecast zinc                                                                     |
| Net weight            | 1,200 g                                                                          |
| Housing color         | Yellow, RAL 1021                                                                 |
| Type of fastening     | Groove mounting<br>Mounting bracket<br>Mounting on Device Column<br>Swivel mount |

**Operation and display**

## Part no.: 68042210 – MLC520R20-1050-EX2 – Safety light curtain receiver

|                 |                          |
|-----------------|--------------------------|
| Type of display | 7-segment display<br>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              | 3D<br>3G                                             |
| 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       | c TÜV NRTL US<br>TÜV Süd |
| Vibration resistance | 50 m/s <sup>2</sup>      |
| Shock resistance     | 100 m/s <sup>2</sup>     |
| US patents           | US 6,418,546 B           |

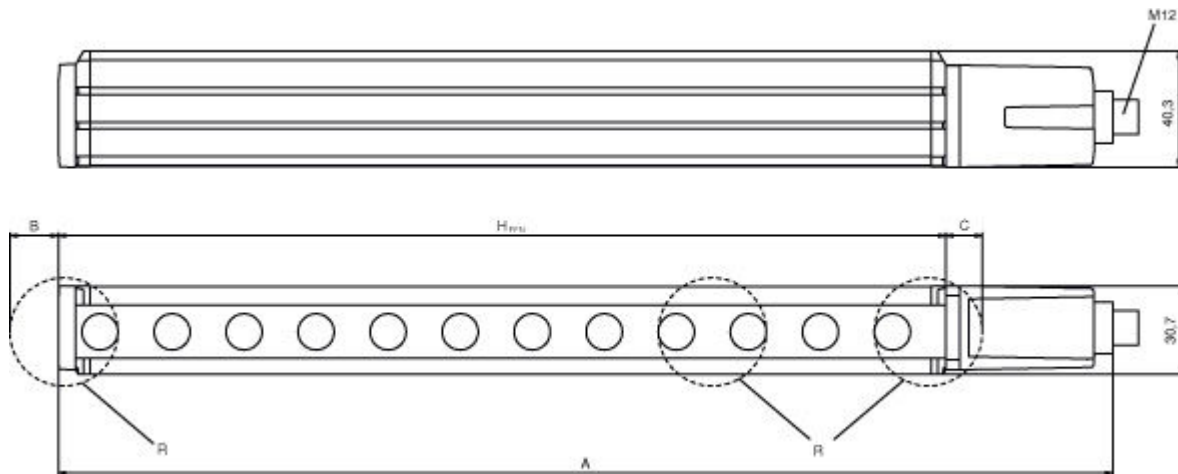
### Classification

|                       |          |
|-----------------------|----------|
| Customs tariff number | 85365019 |
| eCl@ss 8.0            | 27272704 |
| eCl@ss 9.0            | 27272704 |
| ETIM 5.0              | EC002549 |
| ETIM 6.0              | EC002549 |

## Dimensioned drawings

All dimensions in millimeters

Calculation of the effective protective field height  $H_{PFE} = H_{PFN} + B + C$



$H_{PFE}$  Effective protective field height = 1067 mm

$H_{PFN}$  Nominal protective field height = 1050 mm

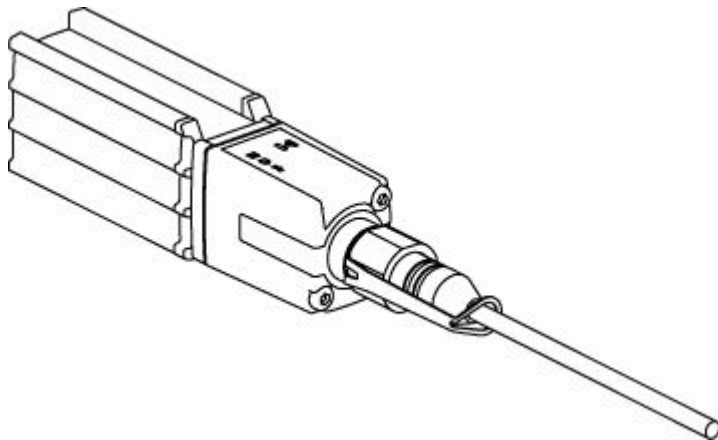
A Total height = 666 mm

B 7 mm

C 10 mm

R Effective protective field height  $H_{PFE}$  goes beyond the dimensions of the optics area to the outer borders of the circles labeled with R.

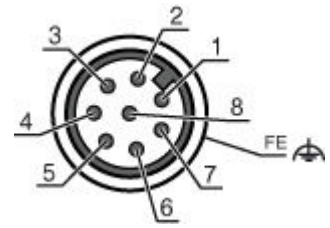
### K-VM12-Ex interlocking guard



### Electrical connection

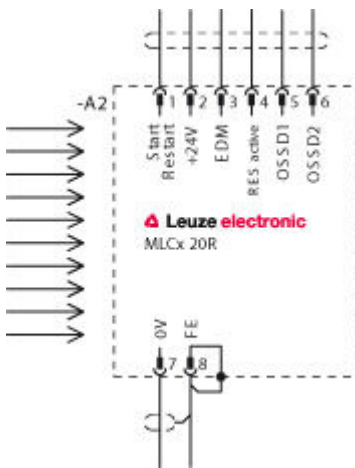
| Connection 1       |                   |
|--------------------|-------------------|
| Type of connection | Connector         |
| Function           | Machine interface |
| Thread size        | M12               |
| Type               | Male              |
| Material           | Metal             |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

| Pin | Pin assignment | Conductor color |
|-----|----------------|-----------------|
| 1   | IO1            | White           |
| 2   | VIN1           | Brown           |
| 3   | IN3            | Green           |
| 4   | IN4            | Yellow          |
| 5   | OSSD1          | Gray            |
| 6   | OSSD2          | Pink            |
| 7   | VIN2           | Blue            |
| 8   | IN8            | Red             |



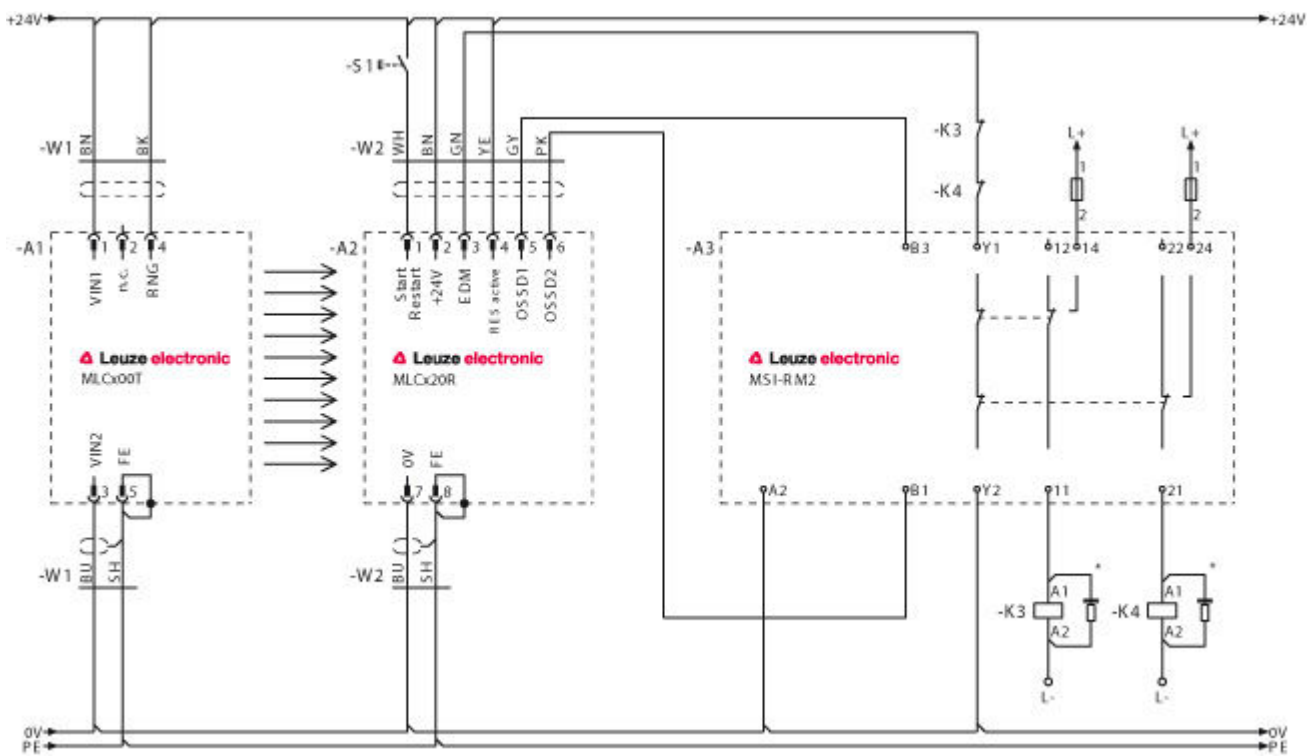
## Circuit diagrams

### Connection diagram receiver



- VIN1 = +24 V, VIN2 = 0 V: transmission channel C1
- VIN1 = 0 V, VIN2 = +24 V: transmission channel C2

Circuit diagram example with downstream MSI-RM2 safety relay




**Operation and display**

LEDs

| LED | Display                 | Meaning                                                                                                               |
|-----|-------------------------|-----------------------------------------------------------------------------------------------------------------------|
| 1   | Off                     | Device switched off                                                                                                   |
|     | Red, continuous light   | OSSD off                                                                                                              |
|     | Red, flashing, 1 Hz     | External error                                                                                                        |
|     | Red, flashing, 10 Hz    | Internal error                                                                                                        |
|     | Green, flashing, 1 Hz   | OSSD on, weak signal                                                                                                  |
|     | Green, continuous light | OSSD on                                                                                                               |
| 2   | Off                     | RES deactivated or RES activated and enabled or RES blocked and protective field interrupted                          |
|     | Red, continuous light   | RES activated and blocked but ready to be unlocked - protective field free and linked sensor is enabled if applicable |

**Suitable transmitters**

|                                                                                     | Part no. | Designation        | Article                          | Description                                                                                                                       |
|-------------------------------------------------------------------------------------|----------|--------------------|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
|  | 68040210 | MLC500T20-1050-EX2 | Safety light curtain transmitter | Resolution: 20 mm<br>Protective field height: 1,050 mm<br>Operating range: 0 ... 9 m<br>Connection: Connector, M12, Metal, 5 -pin |

Part no.: 68042210 – MLC520R20-1050-EX2 – Safety light curtain receiver

## 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                                                                                                                                                                                                          |
| hhhh | <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).


## 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.

## Accessories

### Connection technology - Connection cables

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




Part no.: 68042210 – MLC520R20-1050-EX2 – Safety light curtain receiver



## 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 |

## General

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

## Services

|                                                                                     | Part no. | Designation | Article                                   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------------------------------------------------------------------|----------|-------------|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | S981050  | CS40-I-140  | Safety inspection "Safety light barriers" | Details: Checking of a safety light barrier application in accordance with current standards and guidelines. Inclusion of the device and machine data in a database, production of a test log per application.<br>Conditions: It must be possible to stop the machine, support provided by customer's employees and access to the machine for Leuze employees must be ensured.<br>Restrictions: Travel costs and accommodation expenses charged separately and according to expenditure. |
|  | S981046  | CS40-S-140  | Start-up support                          | Details: For safety devices including stopping time measurement and initial inspection.<br>Conditions: Devices and connection cables are already mounted, price not including travel costs and, if applicable, accommodation expenses.<br>Restrictions: Max. 2 h., no mechanical (mounting) and electrical (wiring) work performed, no changes (attachments, wiring, programming) to third-party components in the nearby environment.                                                   |