

# Technical data sheet

## Safety light curtain receiver

Part no.: 544055

MLC530R30-1650-IP

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For illustration purposes only



## Technical data

### Basic data

Series	MLC 500
Device type	Receiver
Contains	2x BT-NC sliding block
Application	Hand protection

### Functions

Function package	Extended
<b>Functions</b>	
Combination of floating/fixed blanking, can be changed to "fixed blanking" during operation	
Configuration by means of wiring	
Contactor monitoring (EDM)	
Fixed blanking with 1-beam tolerance	
Fixed blanking without tolerance	
Fixed blanking without tolerance, can be activated/deactivated during operation	
Floating blanking, can be changed to "fixed blanking" during operation	
Integration of "contact-based safety circuit"	
Integration of "electronic safety-related switching outputs"	
MaxiScan	
Muting-timeout extension	
Partial muting	
Reduced resolution, can be changed to "fixed blanking" during operation	
Start/restart interlock (RES)	
Timing controlled 2-sensor muting	
Transmission channel changeover	

### Characteristic parameters

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

### Protective field data

Resolution	30 mm
Protective field height	1,650 mm

### Optical data

Synchronization	Optical between transmitter and receiver
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### Electrical data

Protective circuit	Overvoltage protection
	Short circuit protected

### Performance data

Supply voltage U <sub>B</sub>	24 V, DC, -20 ... 20 %
Current consumption, max.	150 mA
Fuse	2 A semi time-lag

### Inputs

Number of digital switching inputs	3 Piece(s)
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### Switching inputs

Type	Digital switching input
Switching voltage high, min.	18 V
Switching voltage low, max.	2.5 V
Switching voltage, type.	22.5 V
Voltage type	DC

### Outputs

Number of safety-related switching outputs (OSSDs)	2 Piece(s)
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### 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, type.	22.5 V
Voltage type	DC
Current load, max.	380 mA
Load inductivity	2,000 $\mu$ H
Load capacity	0.3 $\mu$ F
Residual current, max.	0.2 mA
Residual current, type.	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

### Time behavior

Response time	14 ms
Restart delay time	100 ms

### Connection

Number of connections	1 Piece(s)
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### Connection 1

Function	Machine interface
Type of connection	Cable with connector
Cable length	25,000 mm
Sheathing material	PVC
Thread size	M12
Material	Metal
No. of pins	8 -pin

### Cable properties

Permissible conductor cross section, type.	0.25 mm <sup>2</sup>
Length of connection cable, max.	100 m
Permissible cable resistance to load, max.	200 $\Omega$

## Technical data

### Mechanical data

Dimension (Ø x L)	52.5 mm x 1,850 mm
Housing material	Metal
Metal housing	Aluminum
Lens cover material	Plastic / PMMA
Material of end caps	Diecast zinc
Net weight	1,800 g
Housing color	Yellow, RAL 1021
Type of fastening	Groove mounting Mounting brackets Mounting on Device Column Swivel mount

### Protective tube

Material	PMMA, clear
Material of end caps	V4A stainless steel (1.4404)
Material of clamping cylinder	PA 6
Material of pressure-equalization membrane	PA 6
Cable gland material	PA 6

### Operation and display

Type of display	7-segment display LED
Number of LEDs	3 Piece(s)

### Environmental data

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

### Certifications

Degree of protection	IP 65 IP 66 IP 67 IP 69K
Protection class	III
Approvals	c TÜV NRTL US c UL US S Mark 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

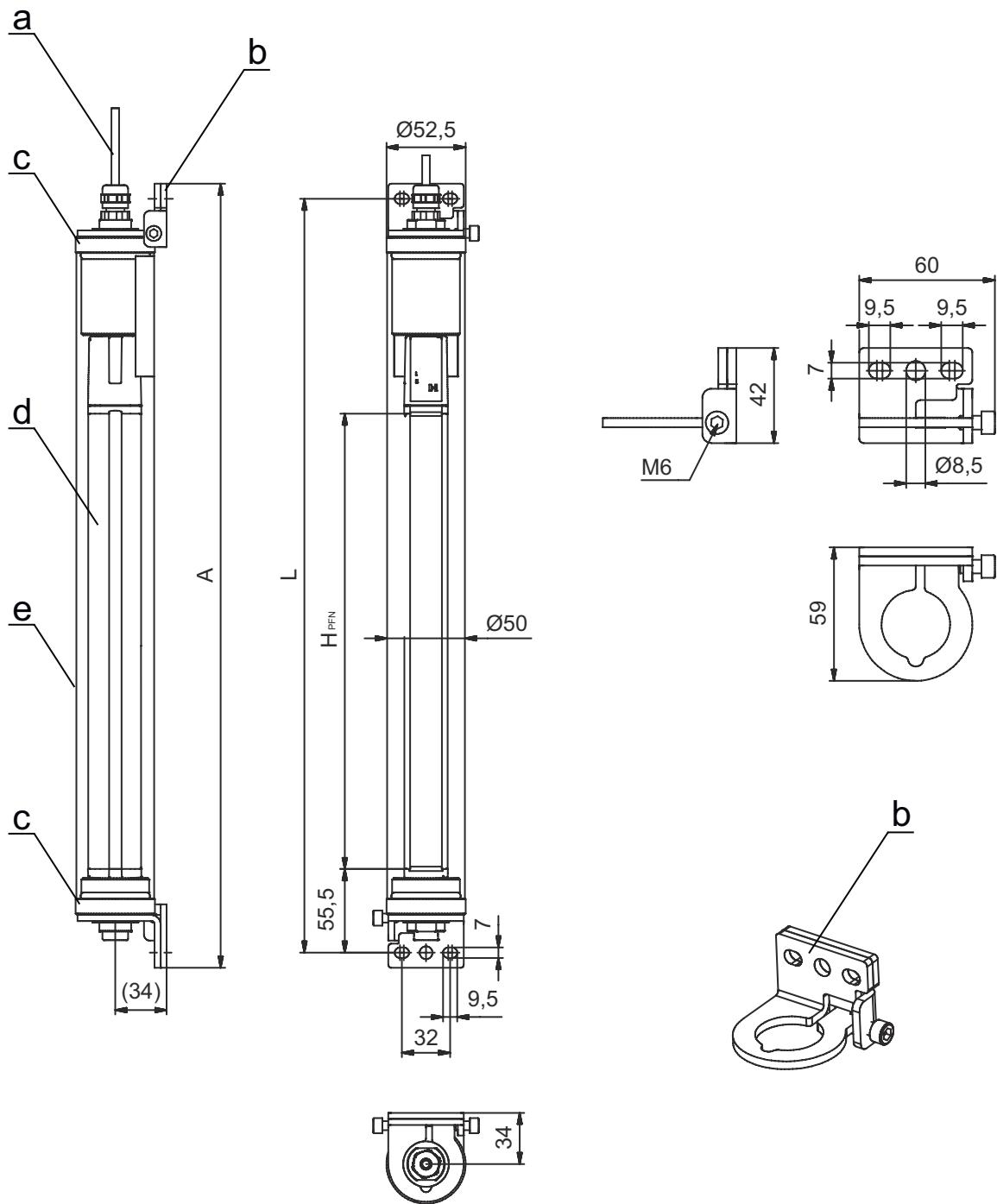
### Classification

Customs tariff number	85365019
ECLASS 5.1.4	27272704
ECLASS 8.0	27272704
ECLASS 9.0	27272704
ECLASS 10.0	27272704
ECLASS 11.0	27272704
ECLASS 12.0	27272704
ECLASS 13.0	27272704
ECLASS 14.0	27272704
ECLASS 15.0	27272704
ETIM 5.0	EC002549
ETIM 6.0	EC002549
ETIM 7.0	EC002549
ETIM 8.0	EC002549
ETIM 9.0	EC002549
ETIM 10.0	EC002549

## Dimensioned drawings

All dimensions in millimeters

MLC safety light curtains pre-mounted in the IP protective tube



- a Connection cable
- b Mounting brackets for mounting
- c End caps, stainless steel V4A
- d MLC receiver
- e IP protective tube

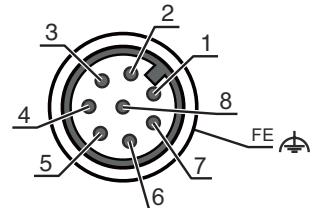
- A Total height incl. mounting brackets = 1870 mm
- L Spacing of drilled holes for mounting brackets = 1850 mm
- $H_{PFN}$  Effective protective field height = 1650 mm

## Electrical connection

### Connection 1

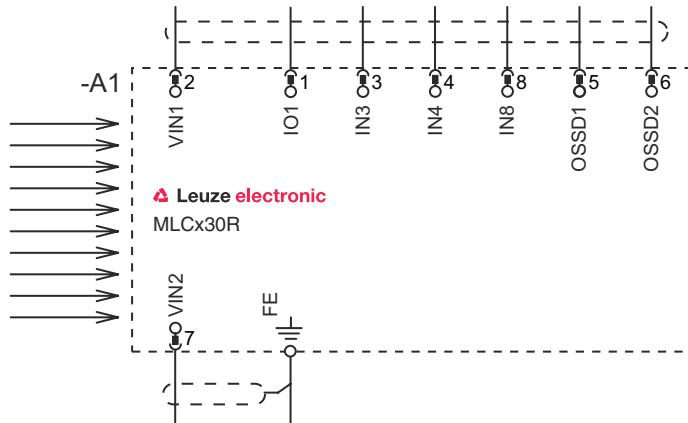
Function	Machine interface
Type of connection	Cable with connector
Cable length	25,000 mm
Sheathing material	PVC
Cable color	Black
Thread size	M12
Type	Male
Material	Metal
No. of pins	8 -pin
Encoding	A-coded
Connector housing	FE/SHIELD

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



## Circuit diagrams

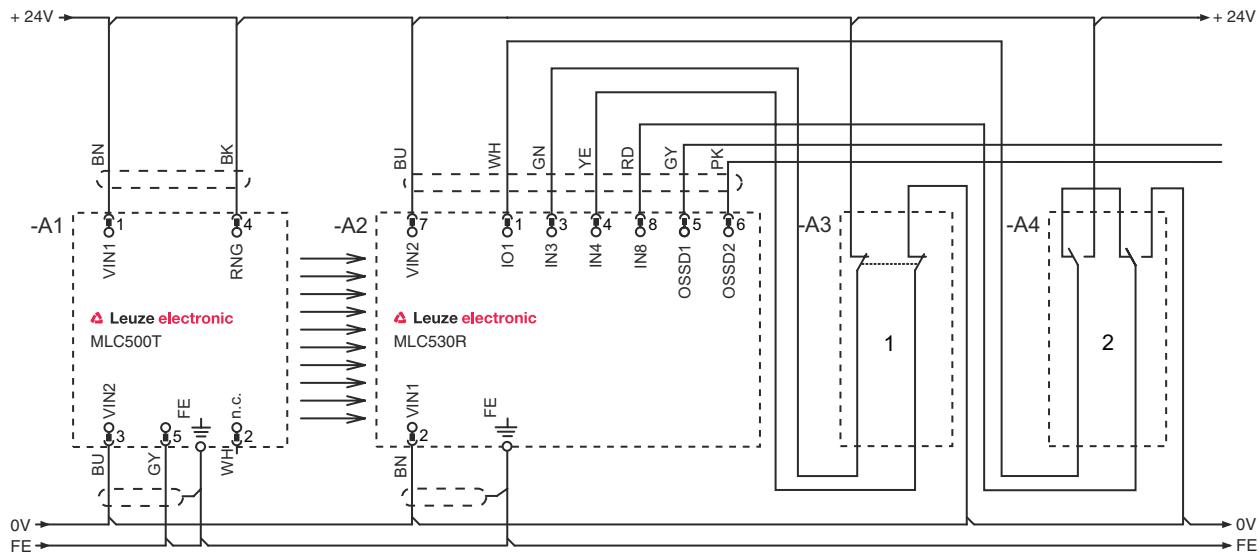
### Connection diagram receiver



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

## Circuit diagrams

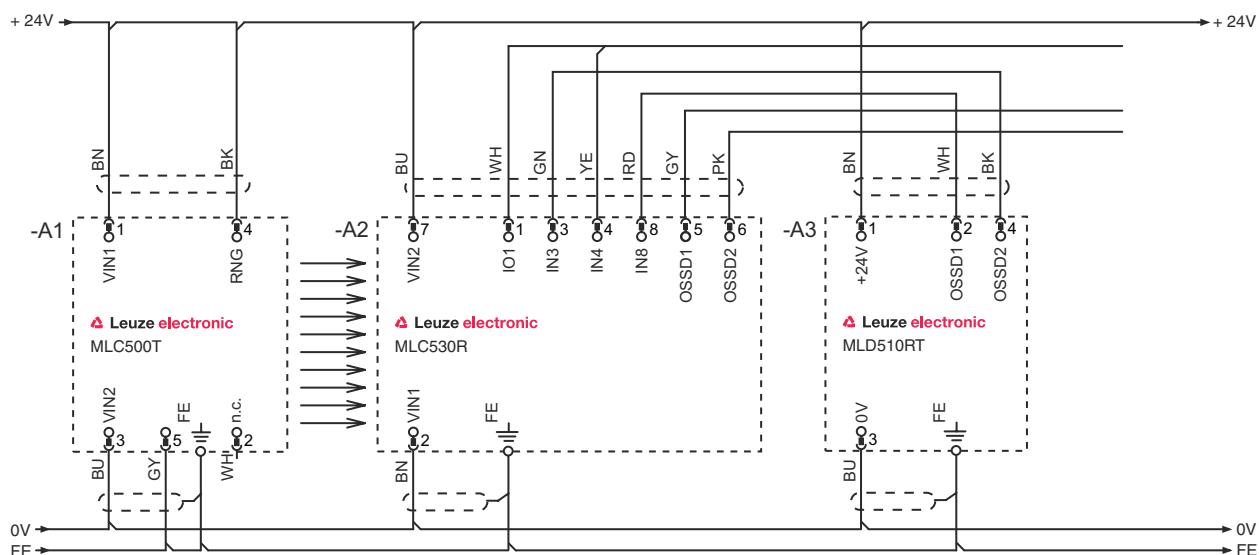
Operating mode 1: circuit diagram example of linkage with position switch for monitoring for the presence of machine parts with fixed blanking



## 1 Linked safety sensor, e.g. safety door switch

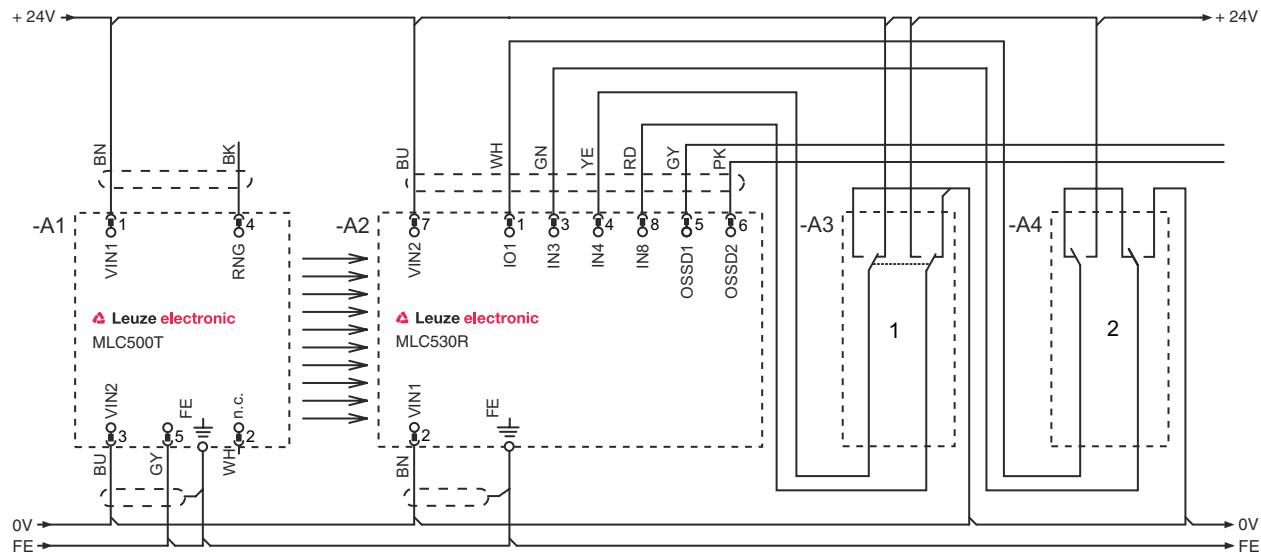
## 2 Key switch for teaching ("teach key switch")

Operating mode 2: circuit diagram example of linkage of electronic safety-related switching outputs for the combined monitoring of access points and areas



## Circuit diagrams

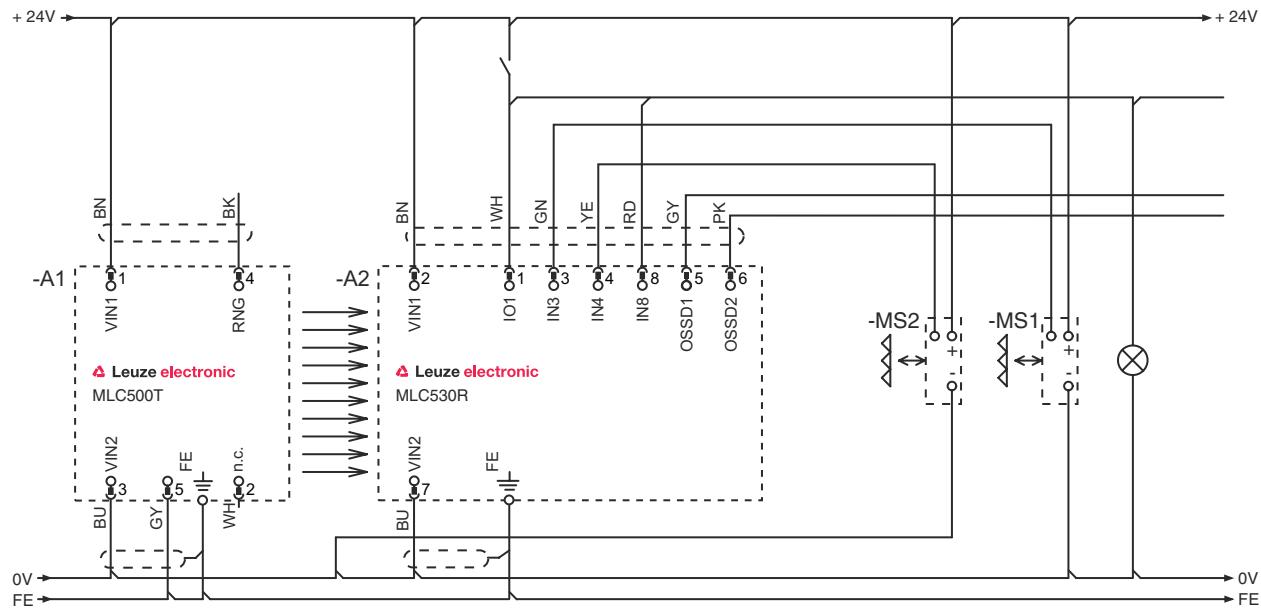
Operating mode 3: circuit diagram example of a linked, contact-based position switch for monitoring of the blanked object and a changeover switch for switching between function groups FG1 and FG2



1 Changeover key switch for switching between function groups FG1 and FG2

2 Key switch for teaching blanking areas

Operating mode 4: circuit diagram example for timing controlled 2-sensor muting



## Operation and display

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

## Operation and display

LED	Display	Meaning
1	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
	Yellow, continuous light	RES activated and blocked but ready to be unlocked - protective field free and linked sensor is enabled if applicable
	Yellow, flashing	Upstream safety circuit opened
	Yellow, flashing (1x or 2x)	Changeover of the upstream safety circuit
3	Off	No special function (blanking, muting, etc.) active
	Blue, continuous light	Protective field parameter (blanking) correctly taught
	Blue, flashing, 1 Hz	Muting active
	Blue, short flashing	Teaching of protective field parameters or muting restart required or muting override active
	Blue, flashing, 10 Hz	Error during teaching of protective field parameters

## Suitable transmitters

Part no.	Designation	Article	Description
	544049 MLC500T30-1500-IP	Safety sensor/transmitter set	Resolution: 30 mm Protective field height: 1,500 mm Operating range: 0 ... 8 m Connection: Cable with connector, M12, Metal, 5 -pin, 15,000 mm, PVC

## Part number code

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

<b>MLC</b>	<b>Safety light curtain</b>	
<b>x</b>	<b>Series</b>	
	3: MLC 300	
	5: MLC 500	
<b>yy</b>	<b>Function classes</b>	
	00: transmitter	
	01: transmitter (AIDA)	
	02: transmitter with test input	
	10: basic receiver - automatic restart	
	11: basic receiver - automatic restart (AIDA)	
	20: standard receiver - EDM/RES selectable	
	30: Extended receiver blanking/muting or gating	
	35: Extended receiver – Gating	
<b>z</b>	<b>Device type</b>	
	T: transmitter	
	R: receiver	
<b>a</b>	<b>Resolution</b>	
	14: 14 mm	
	20: 20 mm	
	30: 30 mm	
	40: 40 mm	
	90: 90 mm	
<b>hhhh</b>	<b>Protective field height</b>	
	150 ... 3000: from 150 mm to 3000 mm	
<b>e</b>	<b>Host/Guest (optional)</b>	
	H: Host	
	MG: Middle Guest	
	G: Guest	
<b>i</b>	<b>Interface (optional)</b>	
	/A: AS-i	

## Part number code

<b>MLC</b>	<b>Safety light curtain</b>
ooo	<b>Option</b> I/V: high Vibration-proof EX2: explosion protection (zones 2 + 22) SPG: Smart Process Gating SPG RR: Smart Process Gating – Reduced resolution
<b>Note</b>	
	↳ A list with all available device types can be found on the Leuze website at <a href="http://www.leuze.com">www.leuze.com</a> .

## Notes

	<b>Observe intended use!</b>
	↳ The product may only be put into operation by competent persons. ↳ Only use the product in accordance with its intended use.

## Accessories

### Services

Part no.	Designation	Article	Description
	S981050	CS40-I-140	Safety inspection 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. 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.
	S981046	CS40-S-140	Start-up support Details: For safety devices including stopping time measurement and initial inspection. Conditions: Devices and connection cables are already mounted, price not including travel costs and, if applicable, accommodation expenses.

	<b>Note</b>
	↳ A list with all available accessories can be found on the Leuze website in the Download tab of the article detailed page.