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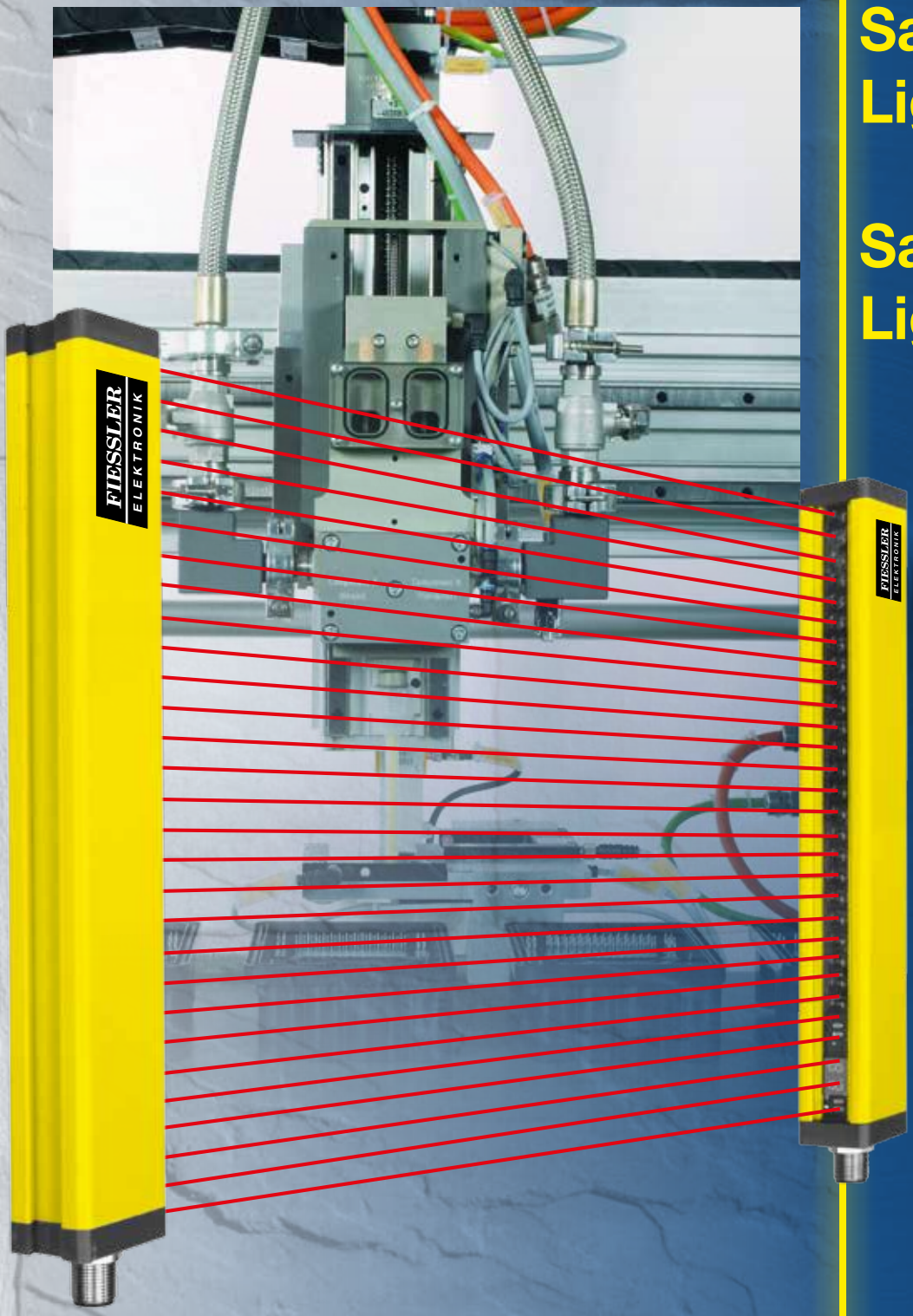
ELEKTRONIK

Safety Light Curtains

Safety Light Grids



Safe.
Reliable.
Economical.

Safety solutions ▲ Sicherheitskomponenten und Sicherheitslösungen
developed and manufactured
FIESSLER ELEKTRONIK
entwickelt und gefertigt
MADE IN GERMANY

HOMEPAGE

ULVT/ULCT

FIESSLER ELEKTRONIK

Innovation

Our vision:

We protect people from accidents and have convincing high quality innovative, user-friendly safety solutions for the customers and are always willing to provide the customer with help and advice.

Our passion:

Fiessler Elektronik has been producing optoelectronic components for the industry since 1956. The resulting development and production of the first fully electronic safety light curtain and safety light grid on the basis of the transmitter-receiver principle began in 1965.

Nearly 30 years later in 1996, Fiessler Elektronik was the first manufacturer worldwide to introduce the groundbreaking innovation of a specially coupled motion safety solution for blanking presses (AKAS®).

In 2005, Fiessler Elektronik completed its solution for blanking presses with its programmable FPSC safety control.

Permanent product care and new developments in dialogue with our customers is what guarantees perfect solutions and high quality products. Certifications, quality monitoring and prototype tests in accordance with worldwide standards are a matter of course for Fiessler Elektronik.

Company description

Service

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Worldwide service

Fiessler Elektronik serves customers in all industrial regions of the world. The service network of Fiessler Elektronik is available in more than 30 countries.

These support points provide effective supervision to machine manufacturers as well as end users.

Branches

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Application areas/ Target groups

Optimal and economic solutions for individual requirements

Safety light curtains/light grids are used wherever hazardous locations and areas need to be secured reliably and economically. Depending on the variation, different safety functions are integrated or can be implemented using safe control solutions.

The range includes small and compact designs up to extremely robust and resilient variations for special environmental conditions up to the highest safety level.

Type 4 (IEC 61496), SIL 3 (IEC 61508), PL e (EN ISO 13849)
Type 2 (IEC 61496), SIL 1 (IEC 61508), PL c (EN ISO 13849)

Your benefit

- Easy assembly thanks to innovative and flexible mounting systems
- Quick commissioning through integrated LED display / 7-segment display and automatic calibration of protective field width up to 60 m range
- Simply safe: robust and reliable with protection type IP 65/67 for use under rough environmental conditions
- Intelligently standardized: Connection technology M12 or terminal compartment for connecting standard cables
- Basic functions without configuration effort enables rapid replacement for service purposes
- Cascading of several safety light curtains possible
- Beam blanking possible
- Beam switching over tilted mirror

Fields of application/Target groups

- Automobile / Automotive and Supplier industry
- Machine tools
- Wood working machines
- Machines and custom machine construction
- Metal working
- Sheet metal work
- Stone and construction industry
- Warehouse and distribution centers
- Consumer goods and packaging machines

System range

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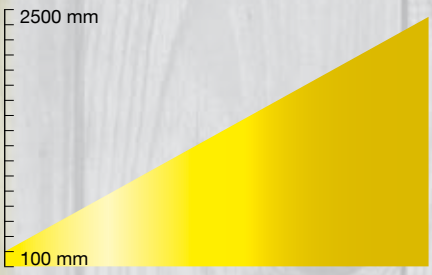
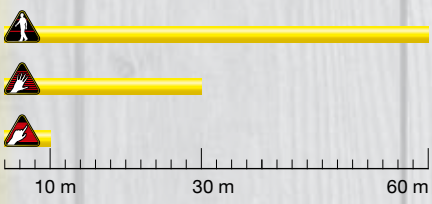
Features of Fiessler Accident Protection Light Curtains

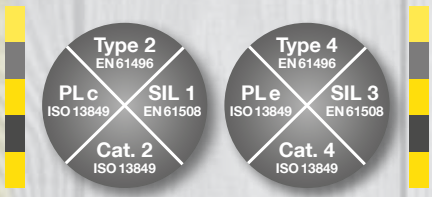
- **Type 4 (IEC 61496), SIL 3 (IEC 61508), PL e (EN ISO 13849)**
- **Type 2 (IEC 61496), SIL 1 (IEC 61508), PL c (EN ISO 13849)**
- **Finger and hand guard, pedestrian access protection**
  High ranges up to 60 m (finger guard up to 10 m,
  Hand guard up to 30 m, pedestrian access protection up to 60 m)
- **Protective field heights of 100 mm to 2500 mm in 100 mm increments** (Special lengths upon customer request)
- **OSSD, transistor oder relay output available**
- **User friendly**
- **Compact and robust**
- **Economical**
- **Short response times**
- **Different designs and versions, appropriate for every application**
  – Integrated switchgear
  – Cascading
  – Blanking function (beam blanking)
  – Reduced resolution
- **Selectable EDM contactor control**
- **Selectable RES restart interlock**
- **Muting function**
- **Sequencing control 1-4 cycle**
- **Emergency stop circuit monitoring**
- **Different connection types available**
  (integrated terminal compartment, M12 or other upon customer request)
- **Customer-requested modifications possible**
- **Various accessories**

Protective field height



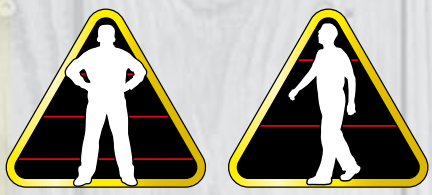
Range





Resolutions

14 mm 30 mm



100-200-300 mm 400-500 mm

optional

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Selection table

Safety light curtains

Safety category	Design W x D (mm)	Finger guard  Resolution (mm) / Range (m)	Hand guard  Resolution (mm) / Range (m)	Personal protection  Resolution (mm) / Range (m)	Personal protection  Resolution (mm) / Range (m)	Personal protection  Resolution (mm) / Range (m)
Type 4 SIL 3 (EN 61508) Performance Level PL e IEC 61496, EN 61496, (ISO 13849-1)	40 x 60	14 / 0-7 / 0-10	30 / 0-24 / 15-30	100 / 0-24 / 15-30	200 / 0-24 / 15-30	300 / 0-24 / 15-30
	25 x 35	14 / 0-5	30 / 0-5			
Type 2 SIL 1 (EN 61508) Performance Level PL c IEC 61496, EN 61496, (ISO 13849-1)	40 x 60	14 / 0-7 / 0-10	30 / 0-24 / 15-30	100 / 0-24 / 15-30	200 / 0-24 / 15-30	300 / 0-24 / 15-30
	25 x 35	14 / 0-5	30 / 0-5			

1) with snap-on muting controller PLSG1 to PLSG3 or switch cabinet version PLSG1K to PLSG3K or safety control FMSC
2) with muting controller switch cabinet version PLSG1K to PLSG3K or safety control FMSC
3) with snap-on safety micro programmable controller PLSG3 or switch cabinet version PLSG3K or safety control FMSC
4) with safety micro programmable controller switch cabinet version PLSG3K or safety control FMSC
5) with snap-on light barrier relay output LSRA or power supply ULSG (potential-free outputs) or contact extension FSEM
6) with power supply ULSG (potential-free outputs) or contact extension FSEM

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and light grids

Pedestrian access protection  Resolution (mm) / Range (m)	Pedestrian access protection  Resolution (mm) / Range (m)	Protective field Protective field (mm) 100 mm-increments Special protective field heights available upon request	Properties: EDM – Selectable contactor control	RES – Selectable restart interlock	Cascading (see pg. 17)	Blanking functions (see pg. 16)	Reduced resolution (see pg. 16)	Muting functions	Sequencing control 1-4 cycle	Relay output optional	Emergency stop circuit monitoring	Door switch monitoring	Designation
400 0-24 / 6-30 / 15-60	500 0-24 / 6-30 / 15-60	100-1900	✓	✓	✓			1)	3)	5)	3)	3)	**ULVT**
			✓	✓	✓	✓	✓						**BLVT**
		100-1500	✓	✓	✓			2)	4)	6)	4)	4)	**ULCT**
			✓	✓	✓	✓	✓						**BLCT**
400 0-24 / 6-30 / 15-60	500 0-24 / 6-30 / 15-60	100-1900	✓	✓	✓			1)	3)	5)	3)	3)	**TLVT**
			✓	✓	✓	✓	✓						**ILVT**
		100-1500	✓	✓	✓			2)	4)	6)	4)	4)	**TLCT**
			✓	✓	✓	✓	✓						**ILCT**

optional

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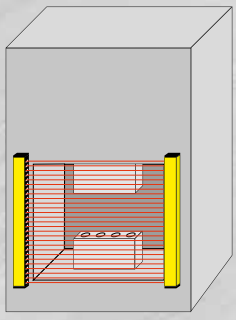
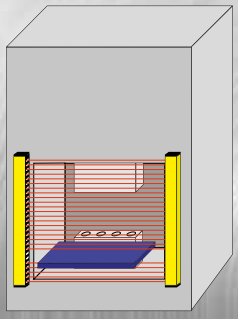
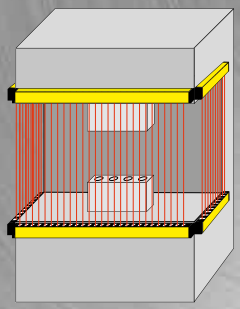
Type 4 – ULCT/BLCT
Type 2 – TLCT/ILCT



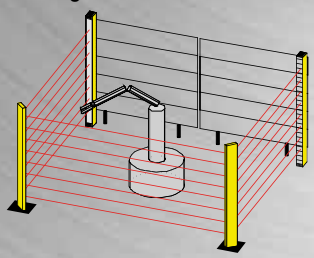
Multi-beam safety light curtains
for safeguarding off hazardous areas.
Finger or hand protection.



Multi-beam safety light curtains with blanking function.



Multi-beam safety light curtains cascading.



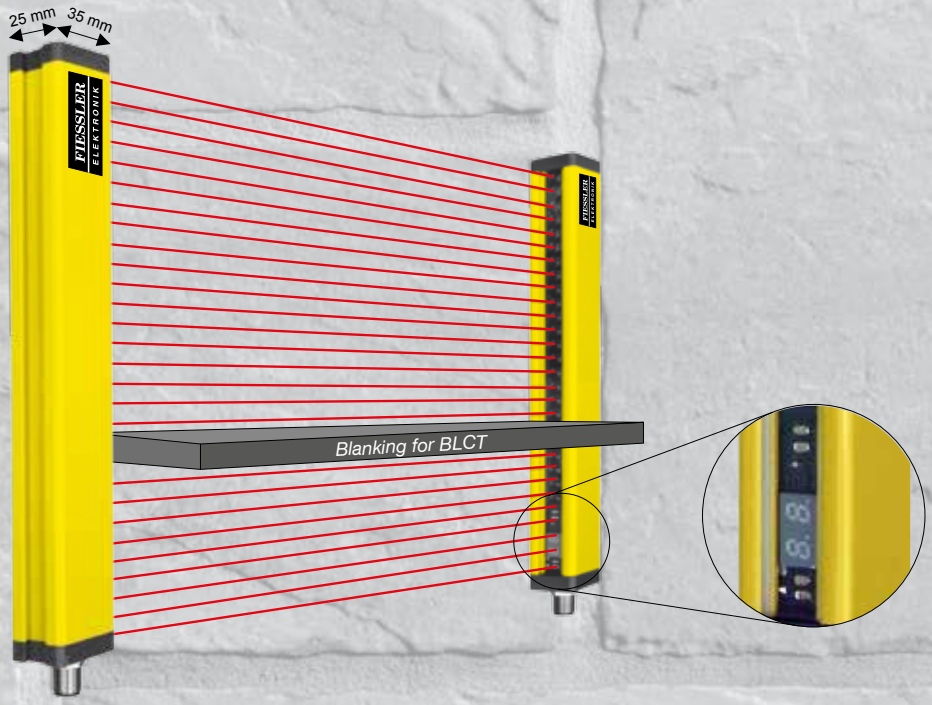
Light grid barriers
for protection of access areas.
Body protection.

Type 2 EN 61496 | PL c ISO 13849 | SIL 1 EN 61508 | Cat. 2 ISO 13849

Type 4 EN 61496 | PL e ISO 13849 | SIL 3 EN 61508 | Cat. 4 ISO 13849

Compact safety light curtains

- **Compact design 25 x 35 mm**
- **Integrated controller**
- **High ranges**
- **Cascading**
- **M12 plug connectors**
- **7-Segment display**
- **Blanking function (BLCT)**



The safety light curtains of the series ...LCT are available as optimized for all applications.

	Protection (protection type: IP 65)	Resolution
ULCT / BLCT	Hazardous area protection, area guarding, finger protection	14 mm
ULCT	Hand protection	30 mm
Cascading	All safety light curtains Available as cascading	14 mm or 30 mm

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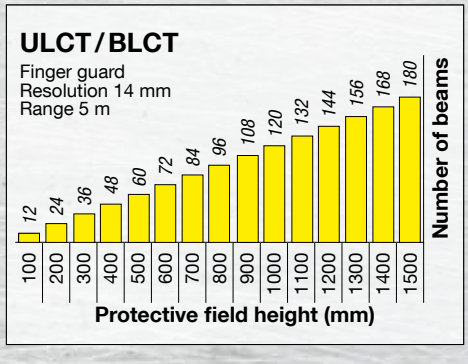
Features

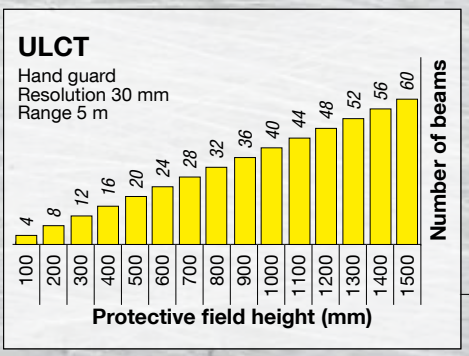
- **ULCT/BLCT:** Safety category 4 (EN 954-1 and IEC 61496 Part 1 + Part 2 or EN 61496) SIL 3 (EN 61508) Performance Level PL e (ISO 13849-1)
- **TLCT/ILCT:** Safety category 2 (EN 954-1 and IEC 61496 Part 1 + Part 2 or EN 61496) SIL 1 (EN 61508) Performance Level PL c (ISO 13849-1)
- Contactor control and restart interlock
  Integrated functions can be programmed without a PC
- Contactors / valves can be connected directly, switching capacity 0.5 A / 24 V
- Beam spacing: 8.33 mm, 25 mm (resolution: 14 mm, 30 mm)
- Protective field widths (range): 5 m
- Semiconductor outputs with short-circuit and cross-circuit monitoring
- Blanking function

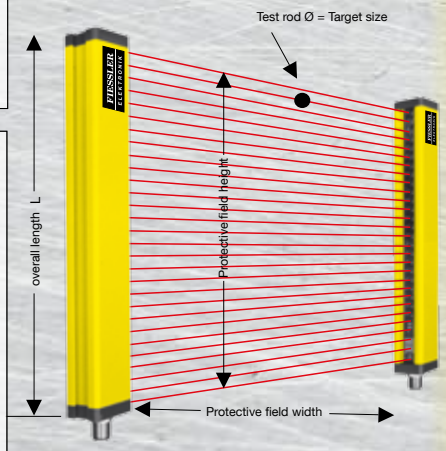
Response time

Depending on overall length: smallest safety clearance due to short response times

ULCT	Basic time 4 ms – 20 ms
BLCT	Basic time 7 ms – 29 ms







Operating modes

- With / without restart interlock
- With / without contactor control (EDM)
- 11 Beam blanking types (BLCT)
- Cascading (... LCT-K)

with optional safety controls

- Muting (bypass unit)
- Cycle operation 1-cycle/4-cycles (e.g. for insertion operations)
- Emergency stop circuit- / safety door monitoring
- Potential-free relay outputs
- Program beam blanking (BLCT) etc.

Standard system

Ordering code:

e.g.: Type: **ULCT 100/12**

System — Number of beams — Protective field height

Cascading light grid

Ordering code:
additionally the abbreviation **K**

e.g.: Type: **ULCT-K 300/36**

Cascading, a standard light grid or an additional cascading light grid can be connected to this light grid

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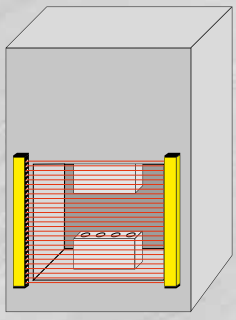
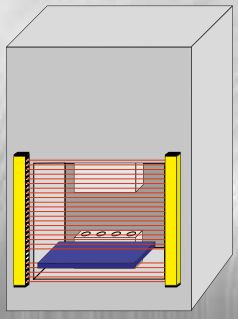
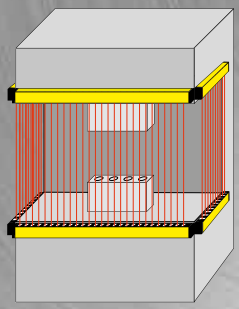
Type 4 – ULVT/BLVT
Type 2 – TLVT/ILVT



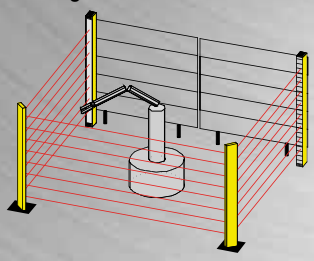
Multi-beam safety light curtains
for safeguarding off hazardous areas.
Finger or hand protection.



Multi-beam safety light curtains with blanking function.



Multi-beam safety light curtains cascading.



Light grid barriers
for protection of access areas.
Body protection.

Safety light curtains
Safety light grids

- **Robust design 40 x 60 mm**
- **Integrated controller**
- **High ranges up to 60 m**
- **Cascading**
- **Blanking function**
- **With terminal compartment for connecting standard cables**
- **M12 available as option**
- **Available with silicate glass pane as option**

The safety light curtains of the series ...LVT are available as optimized for all applications.

	Protection	Resolution
ULVT	Finger and hand protection or pedestrian access protection	14-500 mm
BLVT	Finger and hand protection or pedestrian access protection with blanking function	14-500 mm
ULVT500/2R	Pedestrian access protection with an active transmitter/ receiver unit and a passive tilted mirror unit	500 mm
Cascading	All safety light curtains available as cascading	14-500 mm

Type 2 EN 61496 · PL c ISO 13849 · SIL 1 EN 61508 · Cat. 2 ISO 13849

Type 4 EN 61496 · PL e ISO 13849 · SIL 3 EN 61508 · Cat. 4 ISO 13849

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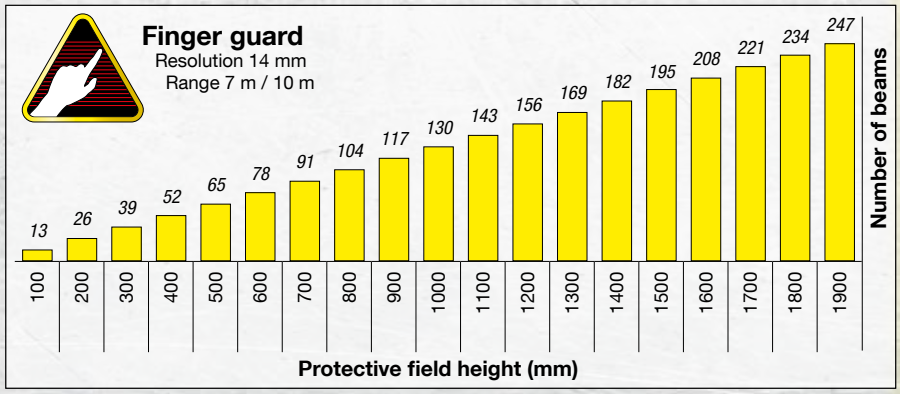
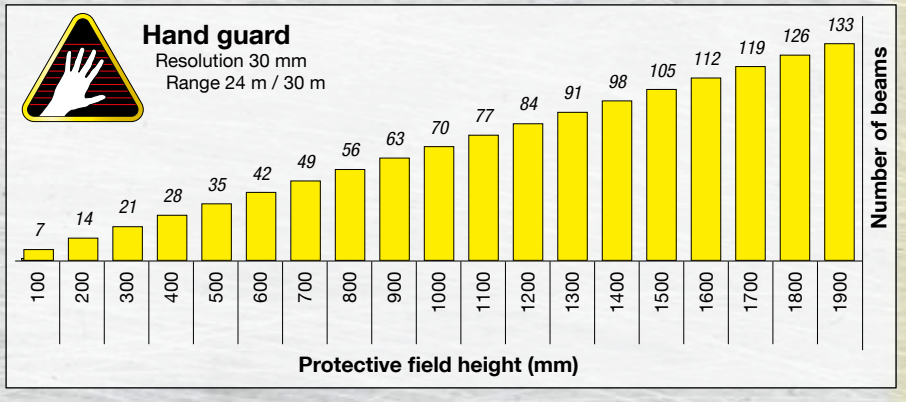
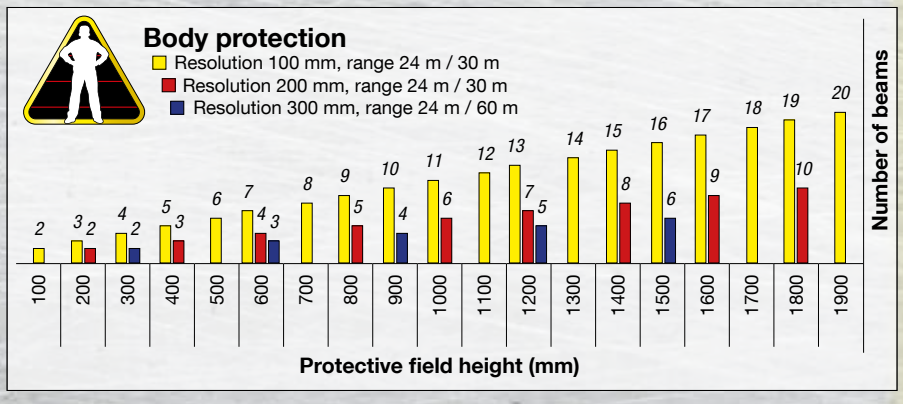
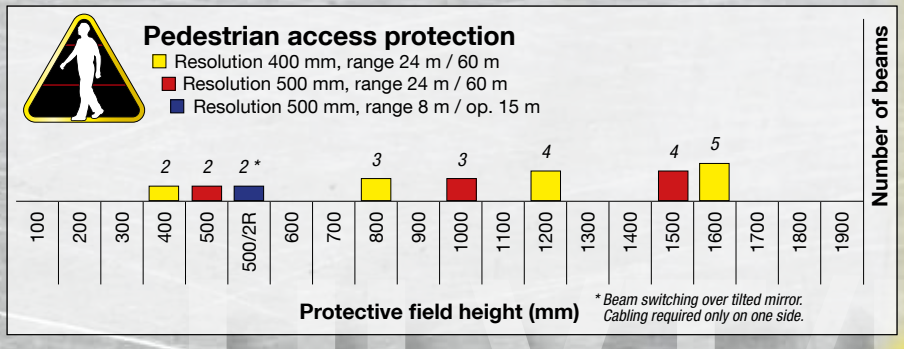
Response time

The light curtains of the series ...LVT are characterized by their particularly rapid response times. This reduces the safety clearance of the light curtain before the hazardous location.









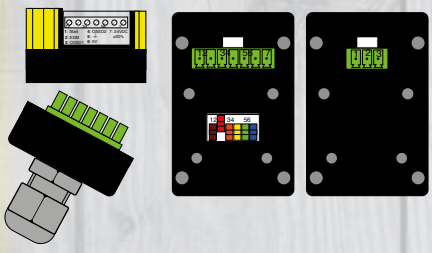
* Beam switching over tilted mirror. Cabling required only on one side.

Controller integrated

The restart interlock and contactor control required for Type 4, PL e, SIL 3 is integrated in the receiver as standard. Additional safety controller is therefore not required for safe operation.

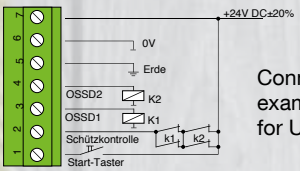
Operating modes

The required operating mode has a user-friendly set up via DIP switches. A PC for programming is not required.



Contactor/Valves can be connected directly

The switching capacity of 0.5 A/24 VDC of both fail-safe outputs (OSSD1 and OSSD2) enables the direct connection of contactors or valves.



Connection example for ULVT

LED indicators

Several LEDs on the receiver and transmitter indicate the respective operating state. Protective field interruptions, contamination, start request or errors are quickly and clearly recognizable.

Self-diagnostics system

If the system detects an internal or external error, the machine is immediately switched off and the LEDs in the transmitter or in the receiver will flash to show the error condition to the user. An optional error diagnostic device enables accurate localization on site. The detected error is output optically and displayed in the error diagnostics device.

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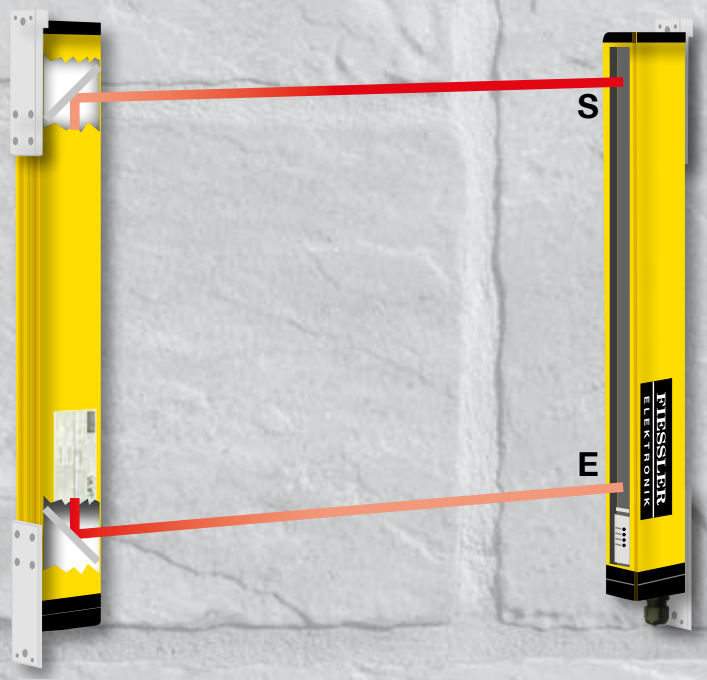
Type 4 – ULVT 500/2R

2-beam safety light grid barrier

- **Robust design 40 x 60 mm**
- **Integrated safety controller**
- **Range 8 m / op. 15 m**
- **Beam deflection via separate passive mirror unit**
- **Cabling required only on one side**
- **Easy assembly and adjustment**
- **Self-monitoring without supplementary circuit**
- **Available with silicate glass pane as option**



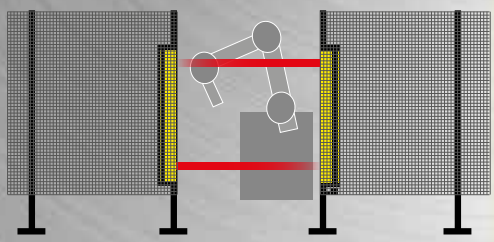
Fields of application

Safe guarding of access areas for e.g.:

- Presses for metal, wood, plastic, rubber, leather and glass processing
- Filter presses
- Folding and bending machines
- Injection molding machines
- Processing centers and welding presses
- Automatic placement machines
- Robots, palletizers
- Stock fuse protection
- Doors and gates, among other things

Features

- Type 4, SIL 3, PL e.
- Response time: 4 ms
- Beam spacing: 500 mm
- Adjustment and contamination indicator installed in the receiver / transmitter unit
- Short-circuit and cross-circuit monitoring
- Safety mode with restart interlock
- Cabling required only on one side
- Active snap-on function unit



Application

The safety grid light barrier ULVT 500/2R is a contact-free acting protection and control system the task of which is to protect people from accidents.
This is done in a way that the power-operated machinery is safeguarded in a way that the access to the hazardous area is only possible by walking though the light beams of a light barrier. Any interruption of the light beams will reliably lead to the complete and timely switch-off of the machine.

Function description

The safety grid light barrier ULVT 500/2R consists of the two components receiver/transmitter unit and tilted mirror. Consolidating the receiver and transmitter in just one housing reduces the cabling effort. (Electrical connection only at the receiver/task unit.)

Type 4 EN 61496
PL e ISO 13849
SIL 3 EN 61508
Cat. 4 ISO 13849

Type 4 – ULVT 1200/4R

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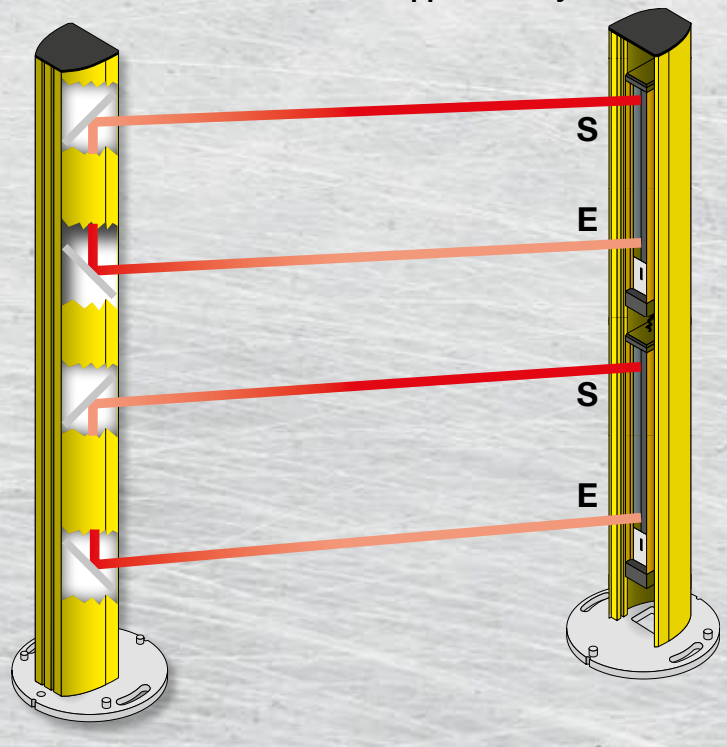
4-beam safety grid light barrier

- **Robust design 40 x 60 mm**
- **Integrated switchgear**
- **Range 10 m / op. 12 m**
- **Beam switching over tilted mirror**
- **Cabling required only on one side.**
- **Easy assembly and adjustment**
- **Self-monitoring without supplementary circuit**



Application

The safety grid light barrier ULVT 1200/4R is a contact-free acting protection and control system the task of which is to protect people from accidents.
This is done in a way that the power-operated machinery is safeguarded in a way that the access to the hazardous area is only possible by walking though the light beams of a light barrier. Any interruption of the light beams will reliably lead to the complete and timely switch-off of the machine.

Function description

The safety grid light barrier ULVT 1200/4R consists of the two components receiver/ transmitter unit and tilted mirror. Consolidating the receiver and transmitter in just one housing reduces the cabling effort. (Electrical connection only at the receiver/ transmitter unit.)

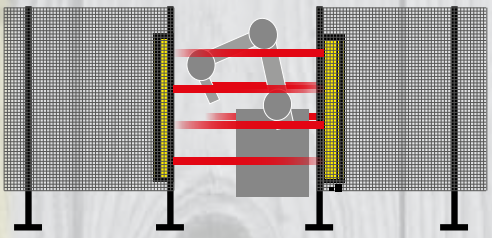
Fields of application

Safe guarding of entrance areas for e.g.:

- Presses for metal, wood, plastic, rubber, leather and glass processing
- Filter presses
- Folding and bending machines
- Injection molding machines
- Processing centers and welding presses
- Automatic placement machines
- Robots, palletizers
- Stock fuse protection
- Doors and gates, among other things

Features

- Type 4, SIL 3, PL e.
- Response time: 6 ms
- Beam spacing: 300 mm
- Adjustment and contamination indicator installed in the receiver / transmitter unit
- Safety mode with restart interlock
- Cabling required only on one side.
- Active snap-on function unit



Type 4 EN 61496
PLe ISO 13849
SIL 3 EN 61508
Cat. 4 ISO 13849

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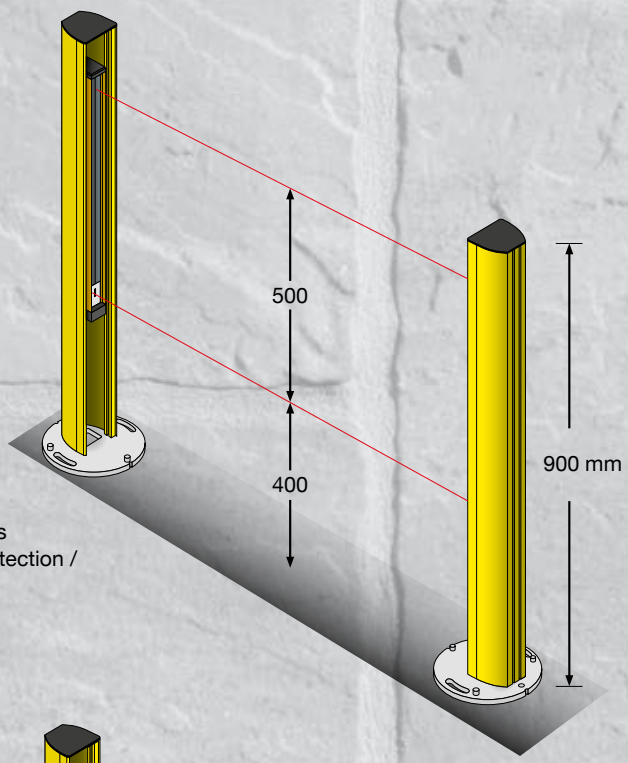
Type 4 – ULVT / BLVT
Type 2 – TLVT / ILVT

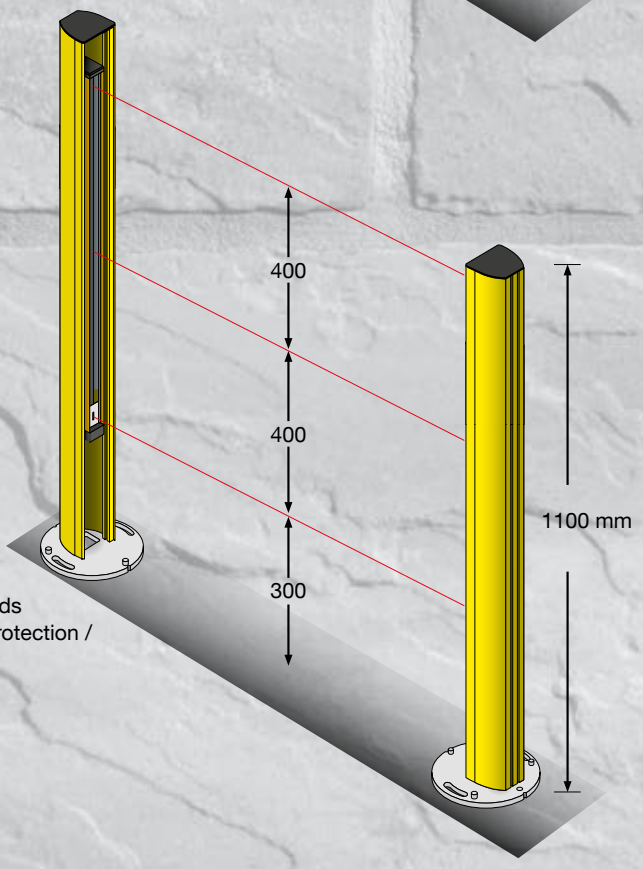
Safety light grids / Multi beam safety light barriers

Fields of application
Safe guarding of entrance with and without muting

- Machine tools
- Storage and conveying technology
- Packaging machines
- Palletizing systems
- Wood working machines
- Stone saw systems



Example 2-beam
according to standards
Pedestrian access protection /
Area protection
with ULVT 500/2



Example 3-beam
according to standards
Pedestrian access protection /
Area protection
with ULVT 800/3

Type 2 EN 61496 | PL c ISO 13849 | SIL 1 EN 61508 | Cat. 2 ISO 13849

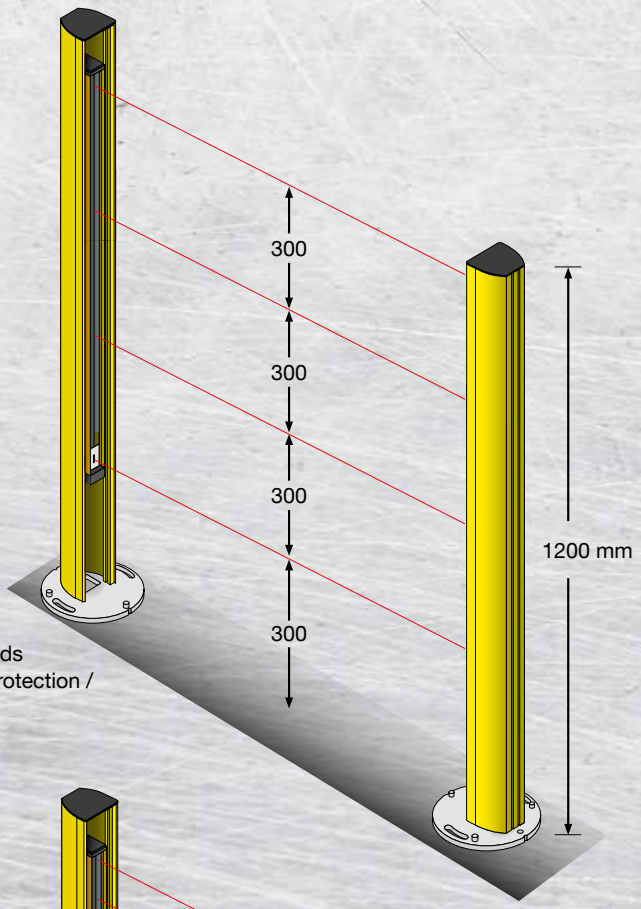
Type 4 EN 61496 | PL e ISO 13849 | SIL 3 EN 61508 | Cat. 4 ISO 13849

Type 4 – ULVT / BLVT
Type 2 – TLVT/ILVT

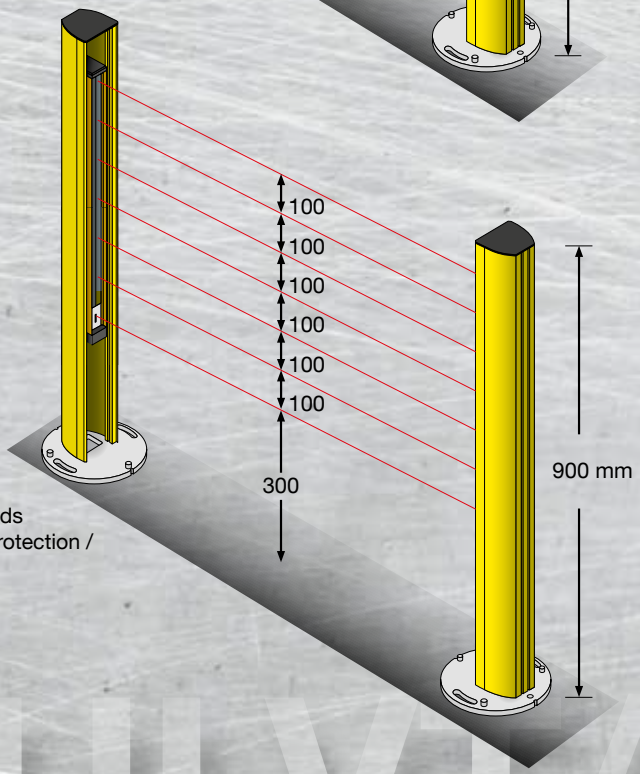
FIESSLER ELEKTRONIK

Safety light grids / Grid light barriers

Features
- Type 4, SIL 3, PL e
  Type 2, SIL 1, PL c
- Beam spacing:
  500, 400, 300, 200 and 100 mm
- Ranges up to 60 m



Example 4-beam
according to standards
Pedestrian access protection /
Area protection
with ULVT 900/4



Example 7-beam
according to standards
Pedestrian access protection /
Area protection
with ULVT 600/7

Type 2 EN 61496 · PL c ISO 13849 · SIL 1 EN 61508 · Cat. 2 ISO 13849

Type 4 EN 61496 · PL e ISO 13849 · SIL 3 EN 61508 · Cat. 4 ISO 13849

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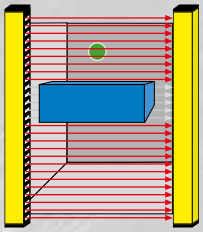
Blanking



● → detectable obstacle size

Figure 16/1
Fixed / floating blanking

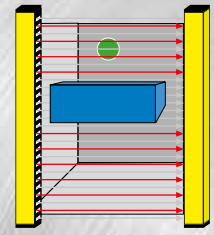


Figure 16/2
Fixed / floating blanking with 1-beam reduced resolution

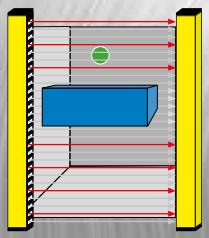


Figure 16/3
Fixed / floating blanking with 2-beam reduced resolution

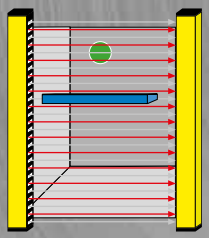


Figure 16/4
1-beam reduced resolution, any number of times

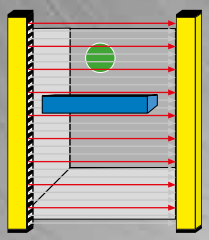


Figure 16/5
2-beam reduced resolution, any number of times

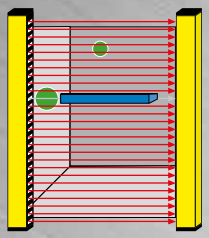


Figure 16/6
Ignore 1 beam only once

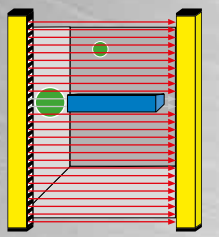
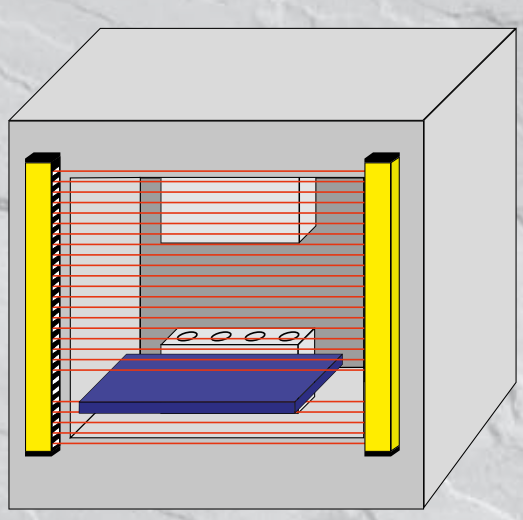


Figure 16/7
Ignore 2 beams only once

Typical applications of the respective blanking types

Blanking renders parts of a protective field ineffective, so that e.g. tool parts or machine parts can protrude into the protective field without impairing the function of the machine.

Blanking types	typical application
1. Blanking off	full protection in entire protective field. Resolution and application like ULVT.
2. Fixed blanking (fixed blanking) Figure 16/1	Blanking of up to 5 objects with stationary location in the protective field. **(e.g. supporting table or material feed devices)**
3. Fixed blanking with **1**-beam reduced resolution Figure 16/2	Combination of 2. and 8. Blanking of up to 5 objects with stationary location in the protective filed and additionally moving thin objects **(e.g. hoses or cables)**, which reach into the protective field occasionally or permanently and interrupt max. 1 beam respectively.
4. Fixed blanking with **2**-beam reduced resolution Figure 16/3	Combination of 2. and 9. Blanking of up to 5 objects with stationary location in the protective filed and additionally moving thin objects **(e.g. hoses or cables)**, which reach into the protective field occasionally or permanently and interrupt max. 2 beams respectively.
5. Floating blanking (floating blanking) Figure 16/1	Blanking of an object that is moving in the protective field **(e.g. height adjustable table)**
6. Floating blanking with **1**-beam reduced resolution Figure 16/2	Combination of 5. and 8. Blanking of an object that is moving in the protective filed and additionally moving thin objects **(e.g. hoses or cables)**, which reach into the protective field occasionally or permanently and interrupt max. 1 beam respectively.
7. Floating blanking with **2**-beam reduced resolution Figure 16/3	Combination of 5. and 9. Blanking of an object that is moving in the protective filed and additionally moving thin objects **(e.g. hoses or cables)**, which reach into the protective field occasionally or permanently and interrupt max. 2 beams respectively.
8. 1-beam reduced resolution Figure 16/4	moving thin objects **(e.g. hoses or cables)**, which protrude into the protective field occasionally or permanently and interrupt max. 1 beam respectively.
9. 2-beam reduced resolution Figure 16/5	moving thin objects **(e.g. hoses or cables)**, which protrude into the protective field occasionally or permanently and interrupt max. 2 beams respectively.
10. Ignore 1 beam only once Figure 16/6	1 flat object to be processed may protrude into the protective field at any location (except synchronous beam!) **(e.g. blanking of sheet metal for blanking presses)**.
11. Ignore 2 beams only once Figure 16/7	1 flat object to be processed may protrude into the protective field at any location (except synchronous beam!) **(e.g. blanking of a thicker piece of sheet metal for blanking presses)**.

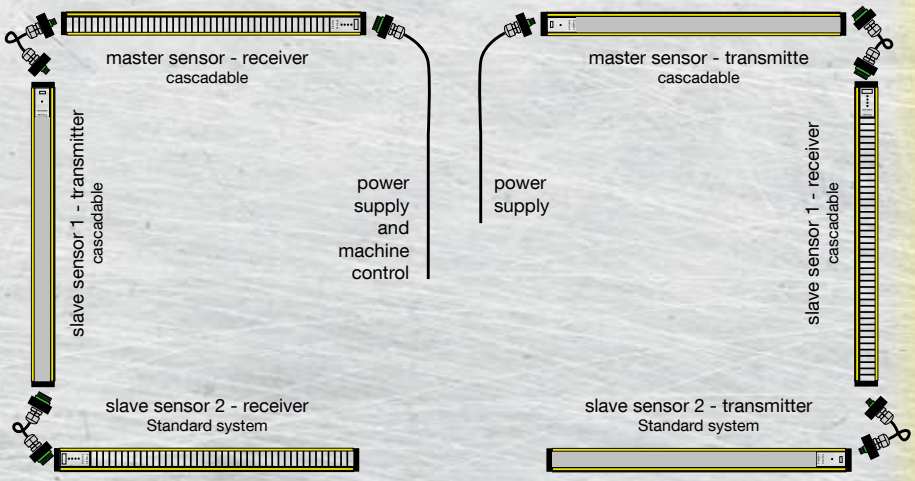


FIESSLER ELEKTRONIK

Cascading of safety light curtains & light grids

Combinable cascading:

- **ULVT, BLVT, TLVT and ILVT**
- **ULCT, BLCT, TLCT and ILCT**
- **Type 4 and 2**
- **PL e and c**
- **SIL 3 and 1**
- **Finger and hand guard, body protection**



Features

- no beam limitation
- fast response times
- Cable lengths max. 10 m between each individual device

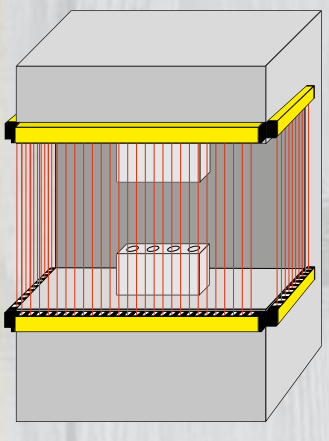
Cascading

Stepping behind can also be monitored with two vertically facing light curtains. The vertical light curtain is responsible for the access protection, the bottom horizontally arranged light curtain assumes the protection against stepping behind. Both light curtains can be operated as individual systems with considerable switching complexity. If they are interconnected in series to a cascade, the same protective goal can be achieved with less wiring and circuitry complexity, assuming a corresponding communication between the processors of the light curtains in the evaluation unit.

Both cascaded light curtains then behave like a single system. Up to three systems can be connected to a cascade.

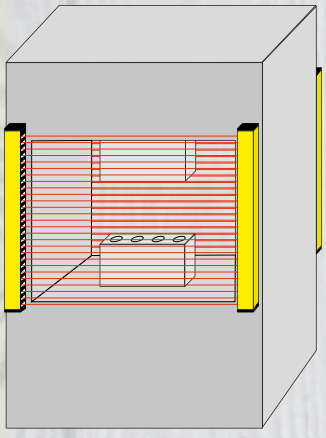
The minimum clearance for the horizontal part of the L-shaped configuration of the cascade must be calculated as well with consideration of the sensor detection capacity. The typical application are bigger mechanical presses and similar machines. The vertical light curtain secures the by-pass to the tool, the horizontal light grids switched in series to a cascade secures the space between the light grid and tool against stepping behind from the sides.

Application examples

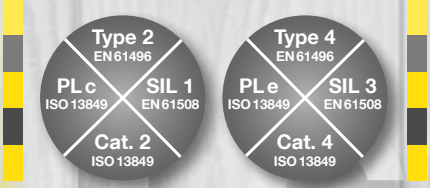


Safe guarding of a C press on 3 sides without obstruction through vertical tilted mirror.

For the cascading arrangement, as opposed to the solution with the vertically standing tilted mirror, there is no obstruction when feeding larger parts.



Step behind protection or rear side fuse protection of a press.



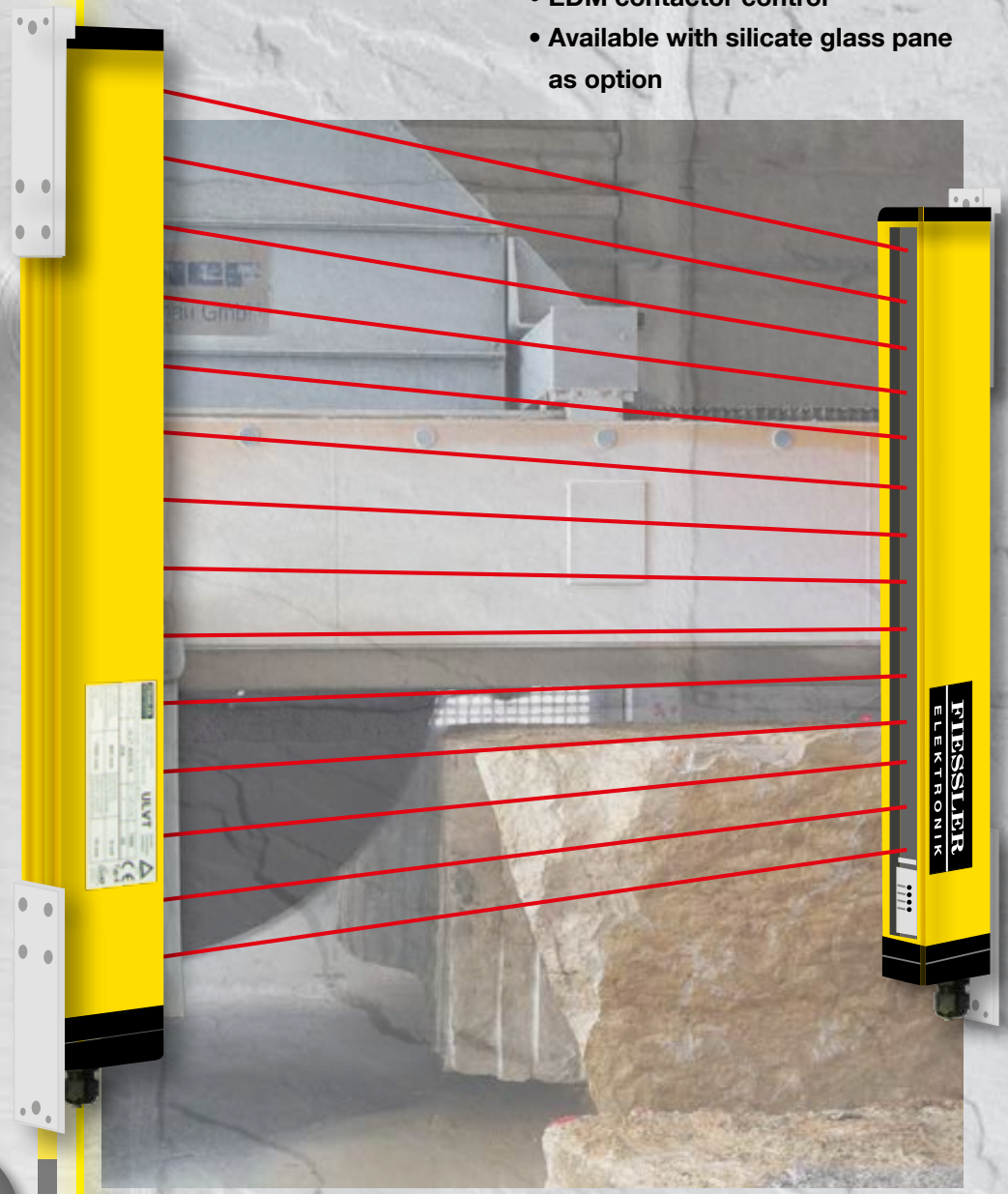
FIESSLER ELEKTRONIK

VS version ULVT / BLVT / TLVT

Safety light grid for area with increased contamination

Fields of application
- e. g. lumber mill plants, stone saws, water jet systems
- Safe guarding in the outdoor area (e.g. snowfall)
- Shutdown only when light beam interrupted by persons

- **Response time: as of 4 ms**
- **Range: up to 60 m**
- **Number of beams: 2 or 3 and 4**
- **Integrated adjustment and contamination indicator**
- **Restart interlock**
- **EDM contactor control**
- **Available with silicate glass pane as option**



Type 2 EN 61496 | PL c ISO 13849 | SIL 1 EN 61508 | Cat. 2 ISO 13849

Type 4 EN 61496 | PL e ISO 13849 | SIL 3 EN 61508 | Cat. 4 ISO 13849

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Application

For application cases in environments with increased pollution due to flying chips, dust, steam such as e.g. in lumber mill plants or water jet systems, conventional safety grids switch off due to water vapor or chips even though no operator is in danger.

With the 2- or 3-beam safety light grid XLVT-VS from Fiessler Elektronik, these areas can be secured so that the machine is only stopped when the safety beams are interrupted by a person.

The special optics of the safety grid XLVT-VS extensively ignores water vapor, splashed water, water jets, sawdust, dust, etc.

Only the large-scale shadowing of light beams triggers the safe shutdown function of the safety light grid.

FIESSLER ELEKTRONIK

Muting station FCMS

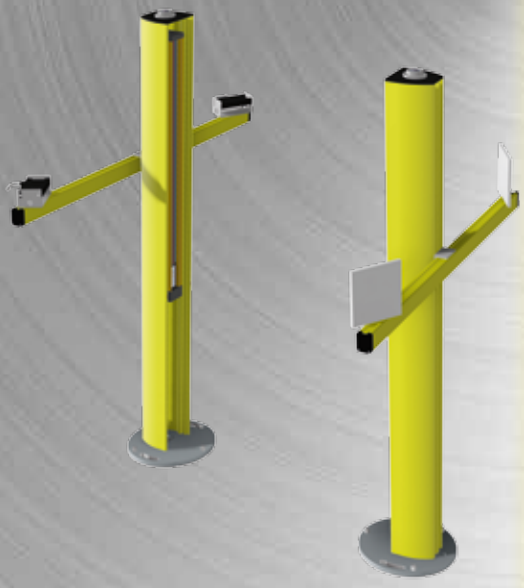
Short-term bypassing of a safety light barrier

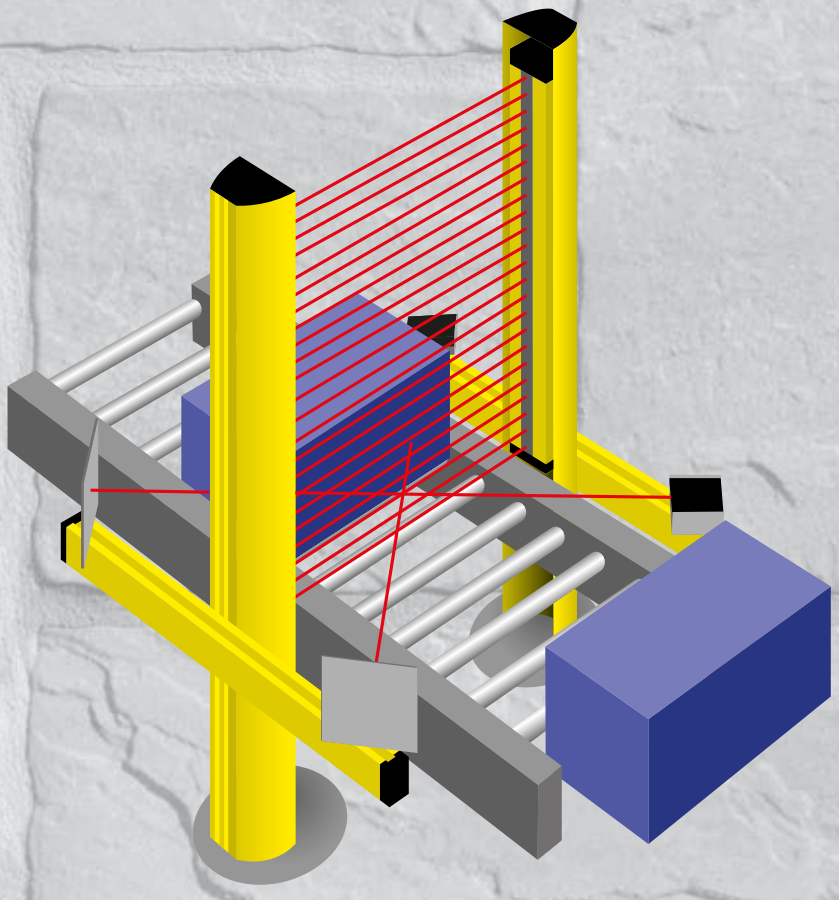
Fields of application
Bypass unit (muting) for the short-term bypassing of a safety light barrier

- Production cells
- Presses and press brakes
- Narrow aisle warehouses

Features
- Self-monitoring without supplementary circuit
- Restart interlock
- Valve or contactor monitoring
- Reliable distinction between human and material flow
- Can be connected to safety light curtain, light grid or light barrier and muting sensors

- **Complete muting unit**
- **Integrated muting sensors & reflectors**
- **Integrated safety light grid & safety light curtains**
- **Less assembly effort**
- **Optional relay output LSRA**
- **Components prewired**
- **Integrated muting lamp**





Muting
(English muting, damping, silencing) describes the bypassing of a safety system. This typically concerns a contact-free active safety system such as safety light curtains or safety light barriers. This bypass is purposeful and intentional and therefore does not fall under the prohibited manipulation of safety systems. The parameters for such muting functions must be selected carefully, e.g. the safety clearances and the type of control. It is important for all bypassed safety functions to be restored immediately after the muting. In addition, a check must be performed in order to verify as to whether and in what way a Muting is displayed and whether the current muting status of a safety application is acoustically or visually indicated to the machine operator.

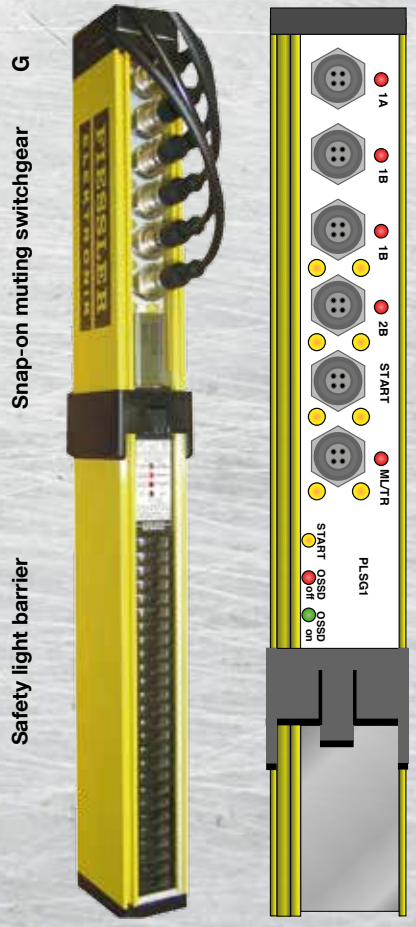
Type 4 EN 61496 | PLe ISO 13849 | SIL 3 EN 61508 | Cat. 4 ISO 13849

PLSG 1 / PLSG 2 PLSG 3

FIESSLER ELEKTRONIK

Directly snap-on muting safety controllers for safety light barriers

- **Muting sensors connected directly**
- **Safety limit switch is connectable**
- **Emergency off/ Emergency stop is connectable**
- **Muting lamp integrated**
- **Two-hand start**
- **Start button connected directly**



Scope of functions PLSG 1

- Override function
- Restart interlock (cannot be deselected)
- Contactor control (cannot be deselected)
- Muting time monitoring (fixed 13.5 hrs.)

Scope of functions PLSG 2

In addition to the version PLSG 1

- Muting end delay adjustable
- Display of operating states in clear text
- Muting end directly when protective field free again
- Output release delay (e.g. for robot application)
- EDM / contactor control function selectable

Scope of functions PLSG 3

In addition to the version PLSG 1 & PLSG 2

- Emergency off/ Emergency stop is connectable
- Safety mode with two-hand start and emergency stop circuit
- Two-hand start directly connectable (only 2 muting sensors possible)
- Cycle operation (PSDI) programmable up to 4 cycles
- Working hours monitoring for cycle operation
- Light curtains programmable with blanking function
- Selector switch for selecting 5 blanking types (in conjunction with switchgear BPSG/BLPG

The safety controller of the series PLSG saves costs due to:

Direct prewiring
- Short wiring
- Reduction of installation costs
- Savings in control cabinet space
- Muting lamp integrated

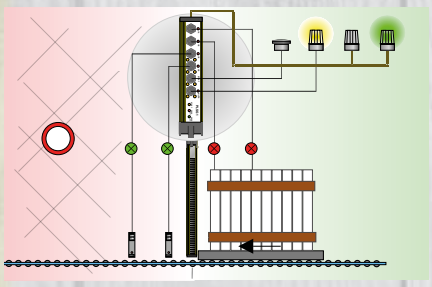
Direct connection of safety components
- Saving of safety switching devices for emergency off, contactor door switch, two-hand control panel or sequence controls

Minimal parameterization effort
- No software necessary
- Short commissioning times
- Fastest replacement in case of error

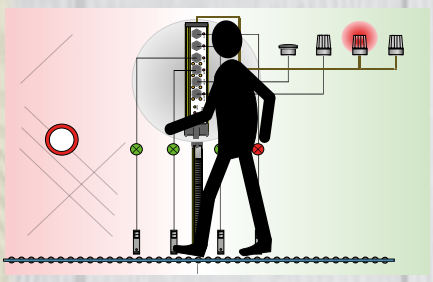
Fields of application

The muting function enables personal protection with unhindered material flow

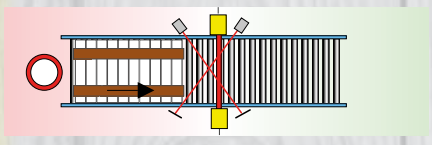
- Safe guarding of central or decentralized systems
- Pedestrian access protection of automatic production systems
- Safe guarding of entry openings to production cells
- Safe guarding of entrance areas
- Conveying and storage technology



Immediate end of muting when the protective field is clear again



If the light barriers are arranged correctly, people will not simultaneously interrupt the muting light barrier pairs A or B.



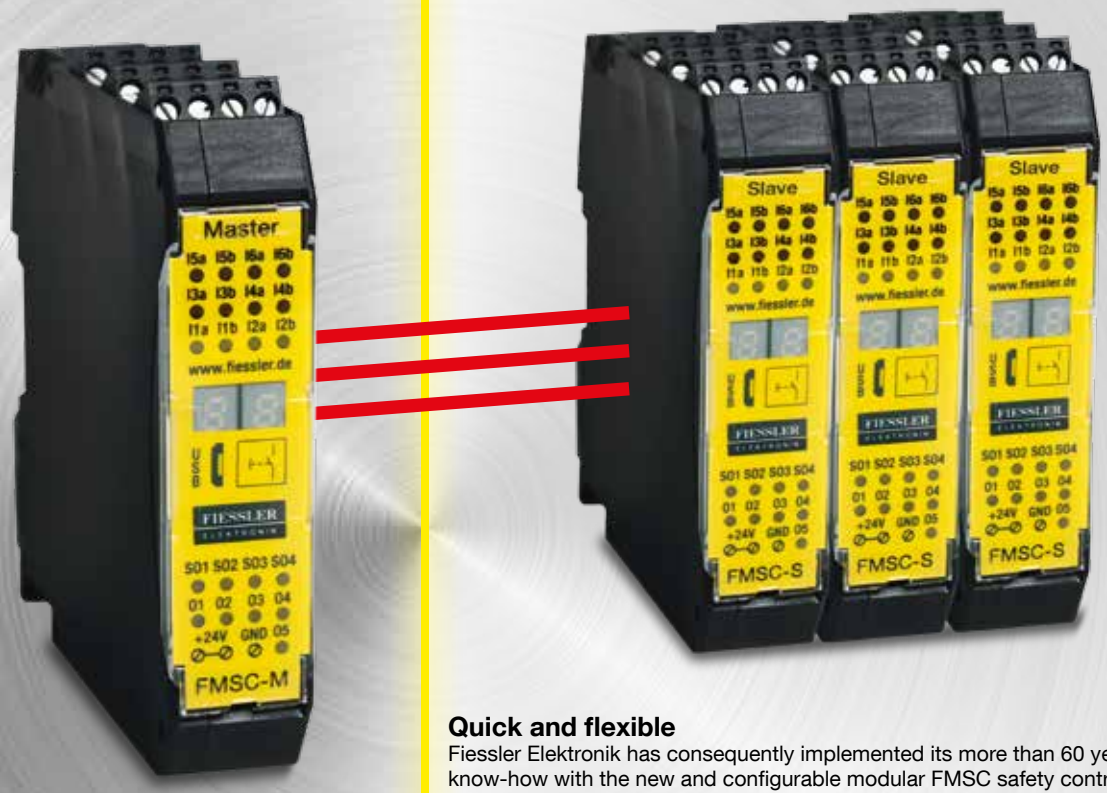
Muting variation cross-muting. The intersection point of both light barrier beams must be within the danger zone.

Type 4 EN 61496 · PLe ISO 13849 · SIL 3 EN 61508 · Cat. 4 ISO 13849

FIESSLER ELEKTRONIK

FMSC System overview

Modular configurable safety control



Quick and flexible

Fiessler Elektronik has consequently implemented its more than 60 years of experience and know-how with the new and configurable modular FMSC safety control. The development not only focused on the high standard of safety but also on how to simply and rapidly implement projects. Versatile functionalities, such as forming combinations, make it easier for the user to program the safety control. Already created projects can also be comprehensively documented. Rapid response times as well as the safety-oriented monitoring of up to 16 axes round off the profile of the new FMSC safety control.

The modular structure of the FMSC system family ensures that the most efficient hardware solutions will always be found for a monitoring task. The variations Eco, Basic, Advanced and Professional provide a selection of different master devices with a respectively different range of functions. The corresponding functionalities are simply integrated or configured with the programming software, FMSC Studio.

The system can be expanded at any time with up to 16 expansion modules. As a result, up to 204 digital inputs and up to 153 digital outputs are available today. And up to 16 axes can be monitored for safety. The compact design makes it easy to integrate the safety control in new systems as well as for retrofitted systems.

The programming

The programming environment, FMSC Studio, is the heart of the FMSC safety control. This software tool will configure all hardware functionalities and create the user program. A great number of pre-finished standard and safety function blocks simplifies the work for the user. Using drag and drop, the modules are placed on the worksheet, which accepts nearly any size, and the individual I/O points are simply graphically connected. Transfer flags do not necessarily need to be set, since FMSC Studio supports both work methods. The individual windows are arranged in a clear and flexible manner to provide an optimal overview at all times.

FIESSLER ELEKTRONIK

Muting for safe bypassing of an optical safety protection

For many applications, materials need to be transported into or out from the area to be protected. An optical safe guarding, however, would shut down the system each time because the material interrupts the safety light curtain. The safe Muting function bypasses the light curtain for the duration of the transport. Depending on the set-up, this is called serial or parallel muting.
The override function can bypass the safety light curtain at any time, helping to recover the system after a standstill and interrupted light curtain.
The pre-finished and certified modules of the FMSC system family supports all muting arrangements.

Muting

Cycle operation – a light curtain not only for safety

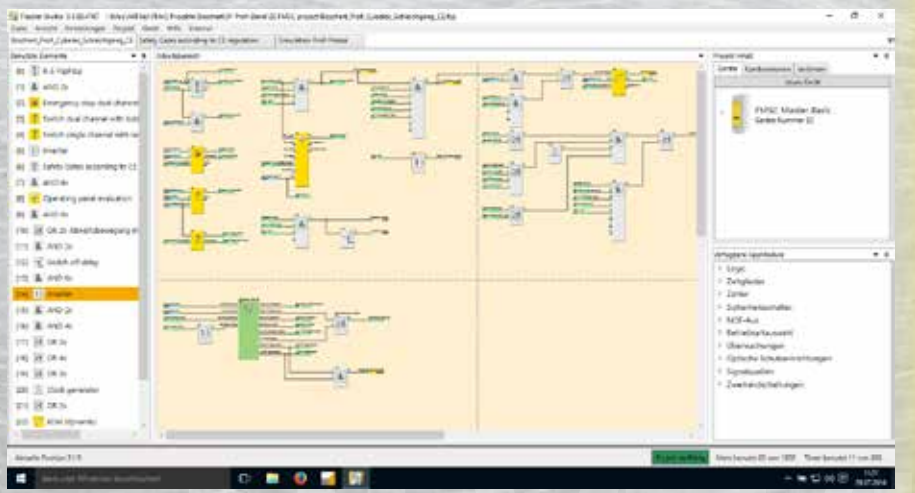
To increase the ergonomics at the machine workplace, an operating step is initialized with the cycle operation (PSDI) via the safety light curtain. Also, productivity at many manual feed workplaces is significantly increased because extra equipment does not need to be activated to trigger the operating step. Depending on machine type, up to four interruptions can be programmed to trigger the operating step. Typical application areas are presses and automatic testing devices that are loaded by hand.

Cycle operation (PSDI)

Programmable light curtain BLVT/BLCT

A safety concept with optical safe guarding must be flexible and capable of adapting to the respective requirement. If not, the motivation to manipulate the
optical safe guarding increases because the safety concept is deemed as interference while working. With the safety light barrier BLVT/BLCT and the safety control FMSC, up to eleven operating modes can be configured and called up during operation. This is done either with the teaching-in function or direct retrieval from a defined memory. The safety concept can be flexibly adapted to requirements at any time.

Light curtain BLVT/BLCT



Programming environment FMSC Studio

FIESSLER ELEKTRONIK

Accessories

ULVT / TLVT / BLVT / ILVT / ULCT / TLCT / BLCT / ILCT

Optionally available electronic / mechanical accessories / Switchgears

FSEM, safety contact extension for safety-oriented applications
Up to Cat.4/SIL3/PLe as per EN 954-1/EN 62061:2005/EN ISO 13849-1: 2008,
Top-hat rail, 3 normally open contact / 1 normally close contact.

Snap-on relay output (potential-free) LSRA, for Type ULVT, BLVT and PLSG

Snap-on relay output (potential-free) LSRA-T, for Type TLVT and ILVT

Power supply, Type ULSG3 / ULSG 6
for each 3x or 6x ULVT / TLVT, ULCT / TLCT or FLSC
for supply voltage 24V DC, potential-free outputs (relay)

Power supply, Type ULSG / ULSG/Duo K
for each 1x or 2x ULVT / TLVT, ULCT / TLCT or FLSC
for supply voltages 115/230V AC & 24V DC, potential free outputs (relays)

BPSG, Blanking programming device with power supply and
positive-action relay with potential-free outputs only for BLVT / ILVT, BLCT / ILCT

BLPG, Blanking light barrier programming device, only for BLVT / ILVT, BLCT / ILCT

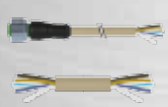
On light barrier receiver of the series ULVT and BLVT, **snap-on muting control devices PLSG 1 / 2 and safety controller PLSG 3,** further expansion configurations and more information, see specification sheet.

Muting controllers PLSG 1K / 2K and safety controllers PLSG 3K, for switch cabinet installation (top-hat rail), further expansion configurations and more information, see specification sheet.

Retrofit Kit FGUL, quick retrofitting from FGS system to ULVT plug-in adapter for transmitter and receiver + mounting bracket.

Laser Adjustment aid JHL 2 for system ULVT/ULCT, TLVT/TLCT, LSUW, EU2K
and columns. Recommended for mounting above mirrors or in case of large ranges.

ASI-BWS-007S, Safe active AS-i-Safe module, device connection via
M12x1 or terminals, Cat.4 / PLe / SIL 3.



Connecting for xLCT transmitter, M12, 4-pole socket, straight, 10m cable
Connecting for xLCT receiver, M12, 8-pole socket, straight, 10m cable
3-wire cable, for XLVT transmitter
7-wire cable, for XLVT receiver

Operating time measuring adapter LZMA, for type ULVT, BLVT, M12 connection

Accessories

FIESSLER ELEKTRONIK

ULVT / TLVT / BLVT / ILVT / ULCT / TLCT / BLCT / ILCT

Optionally available mechanical accessories

Self-supporting column (shock protector) SAU, in different heights for transmitter or receiver of type XLVT, including base plate and compensating plate. The columns are also optionally available with vibration absorber.

Self-supporting column (shock protector) SDSU, complete with mirrors in different heights, including base plate and compensating plate. The columns are also optionally available with vibration absorber.

Column (shock protector) SDSU, complete with mirrors in different heights, without base plate/compensating plate, without free space, with 2 covers as termination.

Column (shock protector) SDU, for transmitter and receiver, without base plate/compensating plate, without free space, with 2 covers as termination.

Tilted mirrors in different lengths, (including ball-and-socket joints)

Rubber-metal mounts, against vibrations from machines, (4 fastening points per bracket)

Angle brackets for side mounting of light curtains

Plexiglas protective enclosure IP 67 for light curtains

EEx-p overpressure encapsulation system.
Compressed air controller for operating the light curtain in areas subject to explosion hazards. ATEX certified in accordance with ATEX 95 (100a) or EN 50016

Heater for safety light barriers in 24VDC or 230VAC

Test rods, in various sizes

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Target groups

Fields of application and target groups

Automobile industry/ Automotive

Wood industry

Machines and custom machine construction

Metal working

Sheet metal work

Stone and construction industry

Warehouse center

Services

FIESSLER ELEKTRONIK

Our experience for your safety

You will be competently advised on site and by telephone by our field representatives and technical consultants:

Application consulting

We support machine manufacturers and end customers in assessing possible dangers and determining necessary safety categories in order to secure systems according to applicable laws and standards.

Support for Risk analysis

Our employees are available for questions and suggestions concerning our products and their integration.

Technical support

We will check if the circuit diagrams you processed are integrated correctly in the associated safety category.

Circuit diagram processing

– Safety inspections before initial start-up
– Annual safety inspections
– Overrun traverse measuring
– Other safety inspections

Standard safety checks

Retrofitting of safety devices with subsequent inspection

System modernization

– Safety seminars, also at the customer's premises
– User training
– Customer-specific training

Safety training

– Safety light barriers
– Safety controls
– AKAS® integrator training
– FMSC integrator training
– Application engineering of safety light curtains, light grids, light barriers

Product training

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The delivery programme

Innovative solutions

Safety light curtains
Type 4, SIL 3, PL e
high range up to 60 m
Very short response time as of 2 ms
Blanking and cascading
Type 2, SIL 1, PL c
Protective field height up to 2500 m
Finger and hand guard, entrance protection
Safety controller integrated

AKAS® press brake safety system
fully automatic adjustment after tool change
laser-optics safety light grid
innovative finger guard through continuous bending without stop

FMSC safety PLC
Emergency shutdown (fast shut down) max. 0.5 ms
Expandable with up to 16 expansion modules
Easiest programming
Cat 4, SIL 3, PL e

Safety contact mats
Type 3, SIL 2, PL d
Series connection of up to ten mats
Load capacity up to 2000N
single component casting also in several colors
individual sizes and shapes
Polyurethane, aluminum or Stainless steel surface
with integrally cast ramp rail available

Safety laser scanner
Cat 3, SIL 2, PL d
Protective field 4 m, range 7 m
Metering section 50 m range
Easy assembly
Warning field 15 m
Several programmable sections

Safety foot pedals
Single-pedal or double-pedal

Controlling, detecting and measuring
Measuring light curtains
Loop sensors
Directional counting light barriers
Hole detectors
Encoding strips

FIESSLER ELEKTRONIK

Fiessler Elektronik GmbH & Co. KG
Kastellstrasse 9 · D-73734 Esslingen
Phone +49 (0)711-91 96 97-0 · Fax +49 (0)711-91 96 97-50
info@fiessler.de · www.fiessler.de

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