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ELEKTRONIK

over 50 years

Our experience for your safety

safety for all applications

complete catalogue

Our experience for your safety

Complete Safety FIESSLER ELEKTRONIK Solutions

Safety sensors

Safety controllers

Safety service

Sensors for conveyors

Controlling, detecting, measuring

Doku Nr. 1142 / EW

Fiessler Elektronik Kastellstr. 9
D - 73734 Esslingen

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Telefax: +49 (0) 711 / 91 96 97-50 eMail: info@fiessler.de

In 1956 qualified engineer H. W. Fiessler founded the Fiessler Elektronik company in Esslingen, Germany, with the aim to produce opto electronic appliances.

Since that time customised solutions are given special emphasis of the entrepreneurial activity. More than 40 years ago Fiessler Elektronik started to develop and produce safety light barriers. Since then thousands of Fiessler Elektronik safety light barriers are used in the industry.

Today Fiessler Elektronik is one of the world wide leading companies in safety light barrier technology.

Now the Fiessler Elektronik company is managed by the second generation.

A team of high qualified employees and a rather broad scale of products are the basis for innovative products in the field of safety technology and customised optical sensors.

A quality control security system according to ISO 9001:2008 guarantees the customer a constant high quality of the products and services.

Complete Safety FIESSLER ELEKTRONIK Solutions

Our vision

We protect People from accidents

and

satisfy customers with innovative,

user-friendly, opto electronic

safety solutions

of highest quality

and

we are always at customers' disposal

in word and deed.

More than 50 years experience in
developing, producing and distributing
safety light barriers stands for guaranteed industrial safety

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C

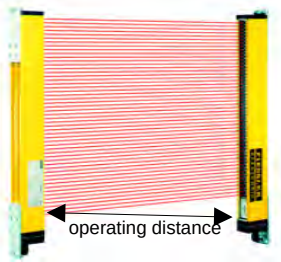
FIESSLER ELEKTRONIK

Selection table --> Safety -light curtain /-light grid

FIESSLER ELEKTRONIK

Safety category	housing B x T (mm)	resolution (mm) range (m) finger protection	resolution (mm) range (m) hand protection	resolution (mm) range (m) body protection	resolution (mm) range (m) body protection	resolution (mm) range (m) body protection	resolution (mm) range (m) access protection	resolution (mm) range (m) access protection	protection field (mm) 100 mm steps Sepecial protection field height available by demand	Characteristics EDM -external device monitoring select. RES - restart interlock select. cascadable Blanking functions reduced resolution Muting functions PSDI mode 1 - 4 stroke relay output optional emergency stop circuit monitoring limit switch monitoring	Identification saftey light curtain **user friendly and efficient** - compact housing - integrated control box - ULVT / BLVT with terminal board for standard cable - ULCT / BLCT with M12 plug connection - 7 digit display
Category 4 SIL 3 (EN 61508) Performance Level PL e EN 954-1 and 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	400 0-24 / 6-30 / 6-60	500 0-24 / 6-30 / 6-60	100 - 1900	✓ ✓ ✓ 1) 3) 5) 3) 3)	**ULVT**
	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	400 0-24 / 6-30 / 6-60	500 0-24 / 6-30 / 6-60	100 - 1900	✓ ✓ ✓ ✓ ✓ 1) 3) 5) 3) 3)	**BLVT**
	25 x 35	14 0-5	30 0-5						100 - 1500	✓ ✓ ✓ 2) 4) 6) 4) 4)	**ULCT**
	25 x 35	14 0-5							100 - 1500	✓ ✓ ✓ ✓ ✓ 2) 4) 6) 4) 4)	**BLCT**
Category 2 SIL 1 (EN 61508) Performance Level PL c EN 954-1 and 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	400 0-24 / 6-30 / 6-60	500 0-24 / 6-30 / 6-60	100 - 1900	✓ ✓ ✓ 1) 3) 5) 3) 3)	**TLVT**
	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	400 0-24 / 6-30 / 6-60	500 0-24 / 6-30 / 6-60	100 - 1900	✓ ✓ ✓ ✓ ✓ 1) 3) 5) 3) 3)	**ILVT**
	25 x 35	14 0-5	30 0-5						100 - 1500	✓ ✓ ✓ 2) 4) 6) 4) 4)	**TLCT**
	25 x 35	14 0-5							100 - 1500	✓ ✓ ✓ ✓ ✓ 2) 4) 6) 4) 4)	**ILCT**

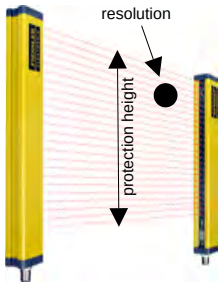
1) with Snap-on Muting controller PLSG1 up to PLSG 3 or DIN rail mounted PLSG1K up to PLSG3K or safety PLC FPSC
2) with DIN-rail mounted Muting controller PLSG1K up to PLSG3K or safety PLC FPSC
3) with Snap-On compact safety controller or DIN rail mounted PLSG3K or safety PLC FPSC
4) with compact safety controller for DIN rail mounting PLSG3K or safety PLC FPSC
5) with Snap-On relay output module LSRA or power supply ULSG or Fiessler safe contact expander module FSEM
6) with power supply ULSG or Fiessler safe contact expander module FSEM



ULVT - BLVT
TLVT - ILVT

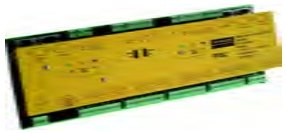
Snap-On safety Muting controller
PLSG1/ PLG2
Snap-On compact safety controller PLSG 3

Self supporting columns



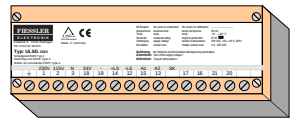
ULCT - BLCT
TLCT - ILCT

Safety Muting controller
PLSG1K/ PLG2K
Compact
safety controller PLSG3K
for DIN rail mounting



Safety PLC
Programmable Safety Centre
FPSC

Snap-On relay output module
LSRA



Power supply with potential free relay outputs
ULSG

optional

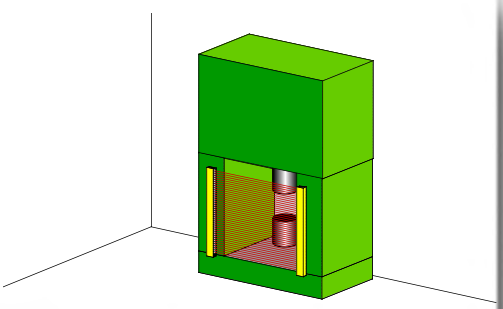
Safety-light curtains

Safety-light grids

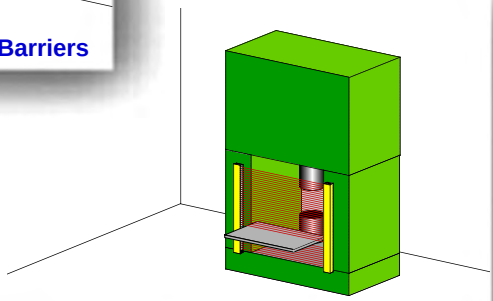
ULVT / BLVT

user-friendly
economically

- model 40x60mm
- integrated controller
- large range up to 60 m
- cascadable
- Blanking function
- with terminals for the use of standard cable



Multi-Beam Safety Light Barriers

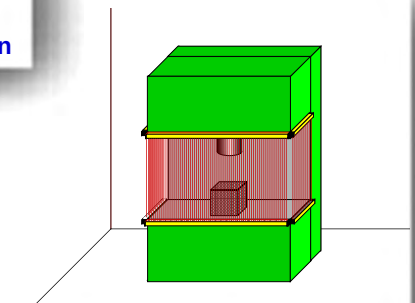


With Blanking Functions

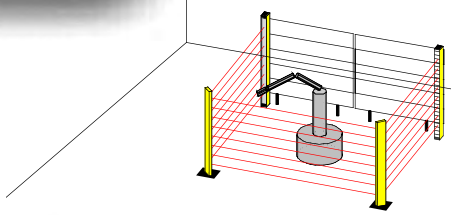
Safety For All Applications*

*** Expert advice and information for the reliable integration of our safety equipment in your machine!**

Safety Light Curtain



Cascadable



Safety Light Grids

Typ 4 EN 61496
PL e ISO 13849
SIL 3 EN 61508
Kat. 4 ISO 13849

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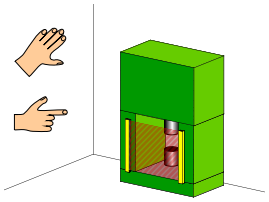
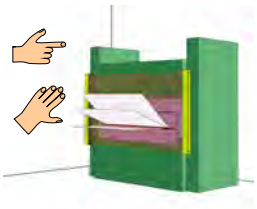
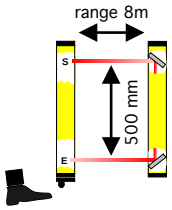
Application Examples



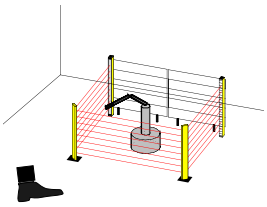
Light Curtains for the protection of dangerous sites. Protection of fingers or hands.



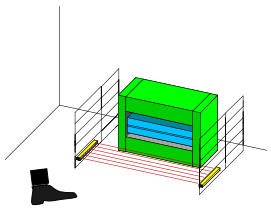
Guarding of special sections of press brakes with light curtains featuring Blanking Functions



Pedestrian access units. with one active transmitter/ receiver unit and one passive deflecting mirror unit



Pedestrian access units. Guarding by Safety Light Grids, body protection.



Fencing off of accessible areas by horizontally positioned light curtain

Type Description

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

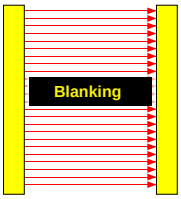
ULVT	Protection of fingers, hands, or pedestrian access guard	Resolution 14 - 500 mm Typ 4, PL e, SIL 3
BLVT	Protection of Fingers, hands, or pedestrian access guard w. blanking function,	Resolution 14 - 500 mm Typ 4, PL e, SIL 3
ULVT500/2R	pedestrian access guard with one activ transmitter/ receiver unit and one passive deflecting mirror unit	Resolution 500 mm Typ 4, PL e, SIL 3
cascading	All safety light curtains available for connection in segments	Resolution 14 - 500 mm Typ 4-2, PL e-c, SIL 3-1

Terminology

Light curtains: safety light curtains for protection of fingers or hands. Beam spacing 14mm or 30 mm.
Blanking function: controlled blanking of light beams to disable selected, fixed areas in the protective field.
Safety light grids: same as safety light curtains, but especially for personal protection as pedestrian access unit. Beam spacing ≥100 mm
Beam spacing: distance between adjacent light beams. In order to enable a reliable stop of the machine, at least 2 beams must be interrupted completely.
Resolution: see also "minimum obstacle diameter". Reference testing measure for safe responding of the light curtain.
Passive transmitter: light grid with opposed mirrors. Only available with a beam spacing of 500 mm (type ULVT500/2R)
Typ 4, PL e, SIL 3: highest safety class for light curtains. If a fault is detected, the the hazardous movement will be reliably stopped at once.
Cascading: For protecting a hazardous area on more than one side, up to 3 light curtains may be connected in series.

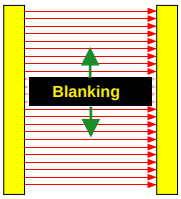
Examples For Blanking Functions

There are 11 different blanking patterns to choose from. Progamming these patterns is very easy.



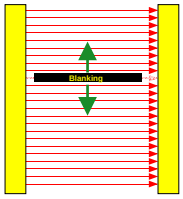
Fixed Blanking

The presence of rigid (fixed) machine parts that permanently reach into the protective field of the light curtain must be blanked.
Full protection for the remainder of the protective field.



Floating Blanking

The presence of moving machine parts that permanently reach into the protective field of the light curtain must be blanked.
Full protection for the remainder of the protective field.

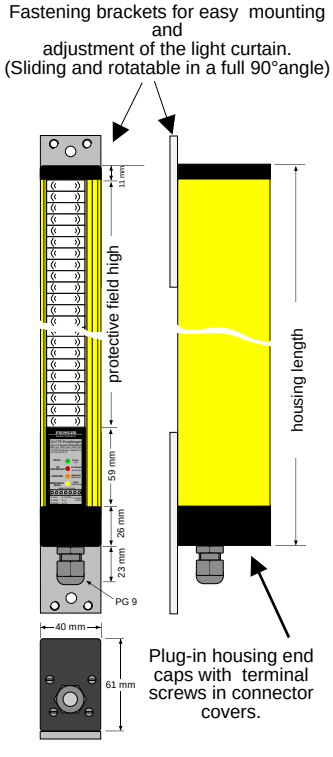


Skip 1 Beam Once

The covering of only one beam that is located at any random position within the protective field, is ignored.
application example:
blanking of a metal sheet at press brakes.

Design

The safety light curtains of the ...LVT series consist of two components: transmitter and receiver. Their detection range is defined by the distance between the transmitter and the receiver; their protective height depends on their individual constructional height (overall height). Therefore, the protective field is defined by both protective height and detection range.
Protective heights from 100mm up to 1900 mm are available because of their modular design. On demand, construction of special units for intermediate-sized application is possible.



Function

The transmitter generates infra-red chopped light beams. The parallel light beams are monitored by micro-controllers. The receiver evaluates the arriving beams in synchronous action to the transmitter.
Due to the beam spacing, a resolution of 14 mm / 30 mm is achieved. If an object is introduced into the protective field, , i.e. if at least one of the light beams is interrupted, both receiver outputs interrupt the hazardous movement of the machine at once, and a restart of the machine is reliably prevented.

Response Time

The safety light curtains of the ...LVT series are characterized by the special short response times.

This reduces the safety distance between the light curtain and the dangerous area.

	basic response time	response time per receiver segment
ULVT	4,3 ms	0,084 ms
BLVT	5,5 ms	0,126 ms
cascaded light curtain	response time main sensor + 3ms for each secondary sensor	

Available standard sizes

Protective height (mm)	Con-struc-tional Height L(mm)	Finger protection	Hand protection	Access protection	Access protection	Access protection	Access protection	Access protection	Access protection
		Resolution 14 mm **Number of beams**	Resolution 30 mm **Number of beams**	Resolution 100 mm **Number of beams**	Resolution 200 mm **Number of beams**	Resolution 300 mm **Number of beams**	Resolution 400 mm **Number of beams**	Resolution 500 mm **Number of beams**	Resolution 500 mm **Number of beams**
v	v	Range 7 m / 10 m	Range 24 m / 30 m	Range 24 m / 30 m	Range 24 m / 30 m	Range 24 m / 30 m	Range 24 m / 60 m	Range 24 m / 60 m	Range 8m
100	196	13	7	-	-	-	-	-	
200	296	26	14	3	2	-	-	-	
300	396	39	21	4	-	2	-	-	
400	496	52	28	5	3	-	2	-	
500	596	65	35	6	-	-	-	2	
500/2R	650		Beam diversion via mirror. Wiring required to only one head.						2
600	696	78	42	7	4	3	-	-	
700	796	91	49	8	-	-	-	-	
800	896	104	56	9	5	-	3	-	
900	996	117	63	10	-	4	-	-	
1000	1096	130	70	11	6	-	-	3	
1100	1196	143	77	12	-	-	-	-	
1200	1296	156	84	13	7	5	4	-	
1300	1396	169	91	14	-	-	-	-	
1400	1496	182	98	15	8	-	-	-	
1500	1596	195	105	16	-	6	-	4	
1600	1696	208	112	17	9	-	5	-	
1700	1796	221	119	18	-	-	-	-	
1800	1896	234	126	19	10	-	-	-	

Protective height: by demand special protective height are available

Order code: example type (**ULVT**)-protective height(**500**)-/number of beams(**35**) — **ULVT500/35**

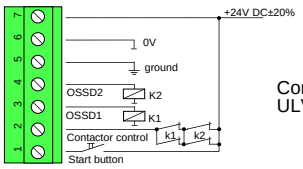
Order code: example type (**BLVT**)-protective height((**500**)-/number of beams((**35**) — **BLVT500/35 (with blanking function)**

Integrated switching unit

The ESPE Typ 4, PL e, SIL 3 requires the restart interlock and valve/contactor control. These characteristics are integrated standard features of the receiver head of the light curtain. Therefore, for the safe operation no additional switching unit is necessary.

Contactors/valves directly connectable

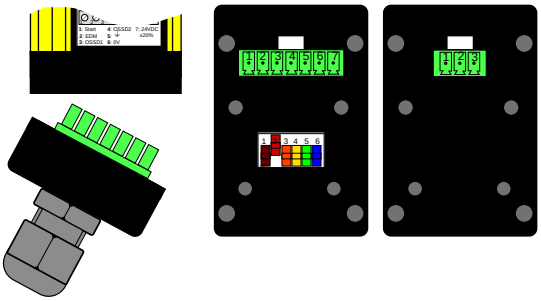
The switching capacity of 0,5 A / 24 VDC of both fail-safe outputs (OSSD1 und OSSD2) permits the direct connection of contactors or valves.



Connection Example for ULVT

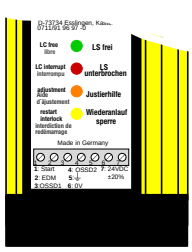
Operational modes

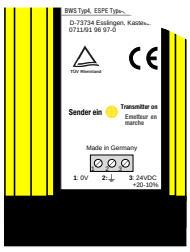
The required operational mode is user-friendly selected via dip-switches. There is no need of a computer for programming.



LED displays

Several LEDs located at the receiver and transmitter heads provide precise and clear indication of the current operating status, such as interruPtion of the protective field, soiling, start requiring signal, or faults.





Integrated plug-in connection in the connection lid

The standard equipment of the product series ...LVT includes an extra flat plug-in connection with screw nut located in the connection lid. This lid may be removed without disconnecting the cable. The housing itself remains sealed.
Several standard connection-plugs are available as options.
The transmitter is connected via a 3-core cable, the receiver is connected via a 5- to 7-core cable (required according to the mode of operation).

Self-Diagnostics Device

If the self-testing of the system detects an internal or external error, the machine will be switched off immediately. The internal or external error will be displayed by the flashing of the LEDs located on the transmitter, respectively on the receiver panel.
An error-diagnostic appliance is available, which enables the exact localization of the errors on the spot. When a fault is detected, the flashing LEDs provide the visual output of the detected fault and display in the diagnostics device.

Accessories

All light curtains are delivered with the necessary plugs and come with adjustable fastening brackets.

For their installation in an open area (e.g. for a multi-sided screening, or protection through tilted mirrors), the units can be supplied as pre manufactured assembly columns.

For the precise alignment of the ULVT light barriers, particularly where large distances or screening through tilted mirrors are involved, a battery powered adjustment laser is available. The device is attached to the front panel of the transmitter. A laser beam which is visible even in broad daylight, shows the direction of the beams coming from the transmitter, thereby providing the most accurate adjustment of the light curtain.

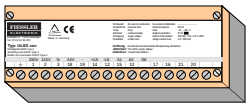
Additional functions

Optional there safety controller available for additional functions such as relay output PSDI mode (1-4 stroke) or Muting: e.g. snap-on realy output module LSRA, power supply with potential free relay outputs ULSG, snap-on safety muting controller PLSG 1 till PLSG 3, compact safety controller PLSG1k -PLSG3k for DIN rail mounting, The prrogramming of all these devices is possible without PC.

Snap-On safety Muting controller
PLSG1/ PLG2
Snap-On compact safety controller PLSG 3

Safety Muting controller
PLSG1K/ PLG2K
Compact safety controller PLSG3K for DIN rail mounting

Safety PLC
Programmable Safety Centre FPSC



Power supply with potential free relay outputs
ULSG

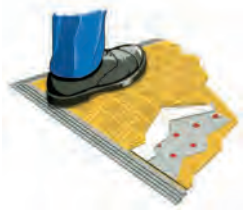
Snap-On relay output module LSRA

Other safety equipment

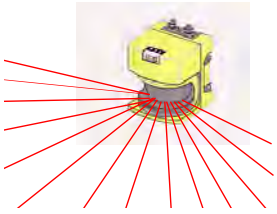
Apart from the above mentioned light curtains and light grids, Fiessler Elektronik provides other components for the protection of your work places.

Service

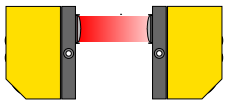
As a special feature for training our customers, Fiessler Elektronik offers one-day safety workshops. Our service team provides you with expert advice and information for the reliable integration of our safety equipment into your machine.



Safety mats

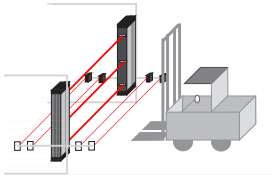


Proximity laser scanner



Single-beam safety light barriers with extra large detection range

Press brake protection system AKAS



Distinguishing man from machine due to special muting applications

HOMOLOGATIONS

In order to ensure and maintain the high quality level of the Fiessler safety products, a quality control security system has been established early. Fiessler Elektronik holds the DIN ISO EN 9001 Certificate and, thanks to the company-owned EMC laboratory, all products must pass an inspection without exception before they leave the company. All safety equipment comply with the applicable national and international standards. Development and Design is made in close co-operation with the German employer`s liability insurance associations. All homologations are obtained only after having passed strict tests by the German surveyor organisation TÜV.

CE BG zugelassen TÜV ZERT UL LISTED Ex

Award of appreciation

for exemplary performance in the development of the press brake protection system AKAS.
The award was bestowed upon Fiessler Elektronik by the ministry of trade and commerce of the federal state of Baden-Württemberg.

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Fiessler Elektronik has respresentations in all major industrial nations.

FIESSLER ELEKTRONIK

Data sheet

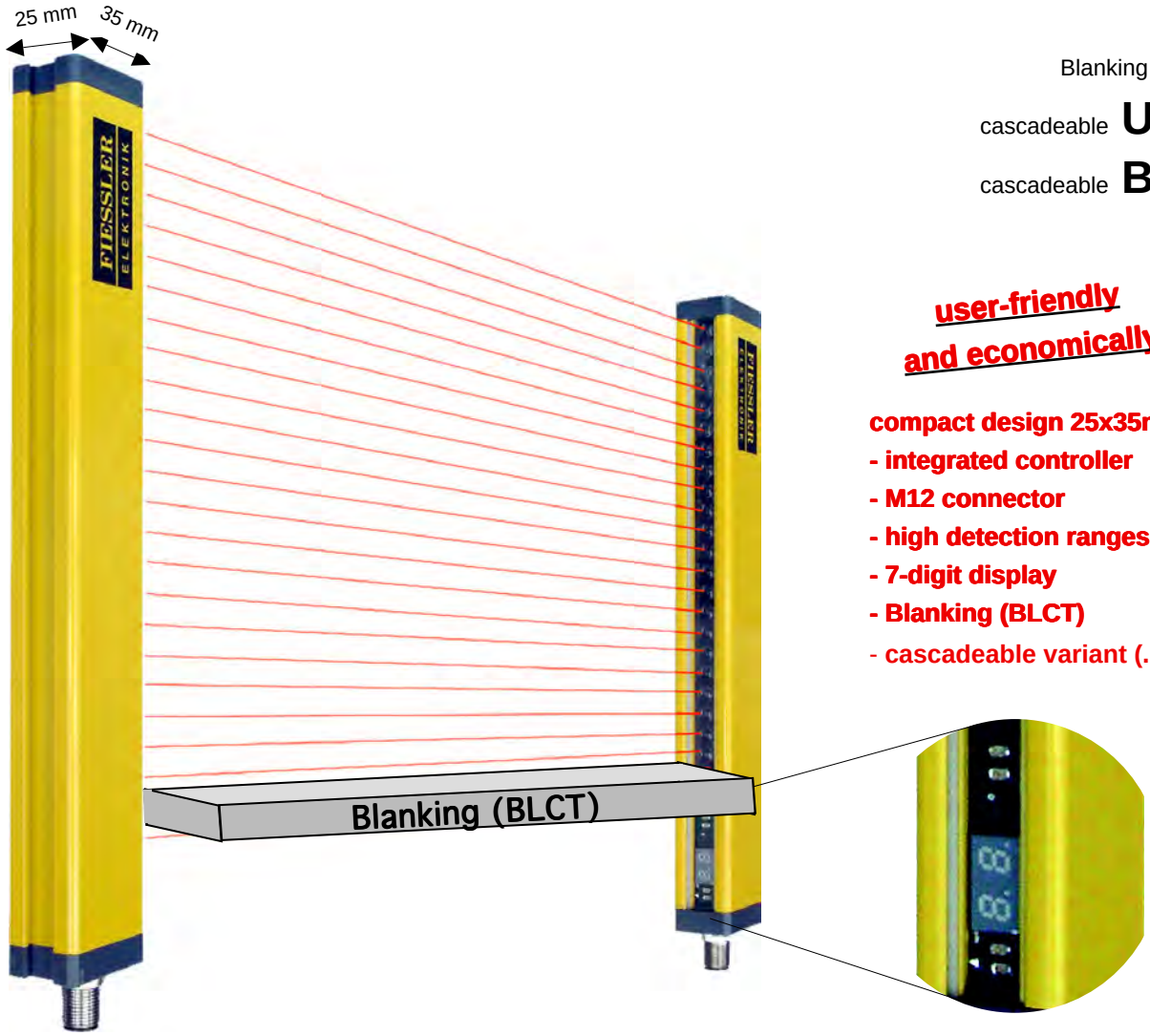
Compact Safety Light Curtains

ULCT

Blanking **BLCT**

cascadeable **ULCTK**

cascadeable **BLCTK**



user-friendly and economically

compact design 25x35mm
- **integrated controller**
- **M12 connector**
- **high detection ranges**
- **7-digit display**
- **Blanking (BLCT)**
- **cascadeable variant (...LCTK)**

Safety cat. type 4 - SIL 3 - Performance Level PL e

Finger and hand protection (14 mm / 30 mm resolution)
11 Blanking modes (BLCT)

integrated controller
-selectable valve control and restart interlock

connection via M12 connector / 7-digit display

compact design 25 x 35 mm with flexible swivel mounting

very short response times and large detection ranges

protection heights until 1500 mm in steps of 100 mm

TÜV

ZERT DIN EN ISO 9001 Reg.Nr. 96007

Typ 4 EN 61496 · PL e ISO 13849 · SIL 3 EN 61508 · Kat. 4 ISO 13849

optional

TÜVRheinland c us

CE

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Features:

- **Safety category 4**
  (EN 954-1 und IEC 61496 part 1 +part 2 or EN 61496)
  SIL 3 (EN 61508)
  Performance Level PL e (ISO 13849-1)
- Contactor control and restart interlock
  Integrated functions can be programmed without a PC
- Directly controllable contactors / valves
  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
- Protective field heights: 100 mm - 1500 mm
- Short reaction times: ULCT 4 ms - 20 ms, BLCT 7 ms - 29 ms
  depending on the length; correspondingly short safety clearances
- Semiconductor outputs with short-circuit and cross-connection monitoring
- Blanking (BLCT)

Areas of application:

Safeguarding of hazard zones,

Protection of fingers and hands, e.g. when operating:

- Presses for metal, wood, plastic, rubber, leather and glass
- Filter presses
- Chamfering and bending machines
- Injection moulding machines
- Machining centres and welding presses
- Automatic placement machines
- Robots
- Pallettizers

Design and function

ULCT / BLCT safety light consist of two components: Light transmitter and light receiver. The clearance between these two components and the installation height determine the width and height of the protective field.

Their modular design permits the realisation of protective field heights ranging from 100 mm to 1500 mm in 100-mm steps.

The transmitter generates infrared light beams in rapid pulses. These parallel light beams are analysed by two single-chip controllers in the transmitter. The beam spacing determines the resolution.

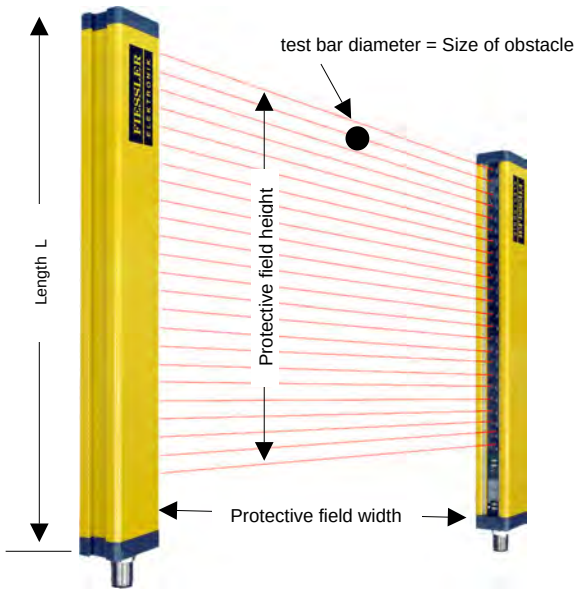
If an object enters the protective field, i.e. if at least one light beam is interrupted, the receiver's two outputs stop the machine or prevent it from starting, thus avoiding hazards.

In the restart with interlock operating mode, the machine can only be restarted by means of the start button once the protective field has been cleared again.

Mirrors can be used to deflect a protective field around hazard zones, permitting creation of multisided barricades.

Muting, cycle mode, monitoring Emergency off and protective doors and potential free switching contacts are realisable with optional safety switching units.

Overview table		**ULCT / BLCT**	**ULCT**
		Finger protection Resolution: 14 mm	Hand protection Resolution: 30 mm
		Range: 5 m	Range: 5 m
Protective field height (mm)	n	no. of beams	no. of beams
100	161	12	4
200	261	24	8
300	361	36	12
400	461	48	16
500	561	60	20
600	661	72	24
700	761	84	28
800	861	96	32
900	961	108	36
1000	1061	120	40
1100	1161	132	44
1200	1261	144	48
1300	1361	156	52
1400	1461	168	56
1500	1561	180	60



Swivel Mounting (Scope of supply)

lateral mounting

rear mounting

Characteristics	ULCT… / BLCT…	
safety class	Type 4 according to IEC 61496, Cat. 4 and PL e according to EN ISO 13849-1, SIL 3 acc. to IEC 61508/62061	
protective heights	100 mm … 1500 mm	
protective width (max. detection range)	0 … 5 m	
resolution	smallest obstacle recognition from 14 mm / 30 mm	
response time	**ULCT**: 4 - 20 ms, **BLCT**: 7 - 29 ms, depending on length - smallest safety distance due to short response times	
self-diagnosis	microcontroller monitoring of the safety functions (self-monitored) fault indication by 7-digit display	
operation modes	- with / without restart interlock - with / without contactor control (EDM) - **11 blanking modes (BLCT)** - **cascadeable variant (...LCT-K)**	**with optional safety switching units PLSG...K**: - Muting - cycle mode 1-cycle to 4-cycle (during inserting work) - Monitoring Emergency off and protective doors - potentialfree switching contacts - programming the blanking (for BLCT)
Mechanical data		
fastenings	- hinge fastening (swivel mounting) at the upper and lower side of the light barrier for fine adjustment - sliding fastening brackets with adjustment screws at rear side of housing - flexible fastening by sliding T-blocks	
housing	Aluminium profile 25x35mm, plastic-coated RAL 1021 yellow. End pieces made from non-corrosive spherically reinforced plastic (polyamide). Plexiglass light outlets and inlets.	
Operating data		
protection category	IP 65	
protection class	III	
operating ambient temperature	-10 to 55 °C	
storage temperature	-25 to 70 °C	
Electric data	**transmitter ULCT-S / BLCT-S**	**receiver ULCT-E / BLCT-E**
power supply	24 V DC SELV, + 20 % - 15 %	24 V DC SELV, ±20%
current draw	max. 250 mA	max. 250 mA (no load)
outputs	-	OSSD 1 and 2: fail-safe PNP-outputs, max. 0,5 A short-circuit and cross-circuit monitoring
inputs	-	contactor control and Start button 0 V bis 24 V DC ±20%, 10mA
electric connection	M12 connector 4-core	M12 connector 8-core.

Accessories and Spare parts	Order code
14-mm test rod with fastening clips (in case of strong vibrations)	PS 14
30-mm test rod with chain (in case of strong vibrations)	PS 30
Deflecting mirror	USP 100 ... USP 1500
Laser adjustment aid	JHL2
4-pol. M12- **cable connection** / emitter / 5 m Length (Other lengths on request) 	XC/M12/4pol/5m
8-pol. M12-**cable connection** / receiver / 5 m Length (Other lengths on request) 	XC/M12/8pol/5m
4-pol. M12- **extension cable for cascaded light grids** / 2 m Length 	XC/M12/4pol/2m/K
8-pol. M12- **extension cable for cascaded light grids** / 2 m Length 	XC/M12/8pol/2m/K
4-pol. M12 **Round plug connector** Screw terminals 	M12/4/K
4-pol. M12 **Round plug connector** Screw terminals 	M12/8/K
Swivel Mounting for transmitter and receiver (scope of supply) 	-
Slot block (1 piece) (optional) 	NS
Aluminium shackles (optional) 	on request
Metallic fastening rocker for a shackle (in case of strong vibrations)	SM

Standard system

Cascadable light grid

Order code of **standard system**:

i.e. Type: ULCT 100/12

system protective field — beam count

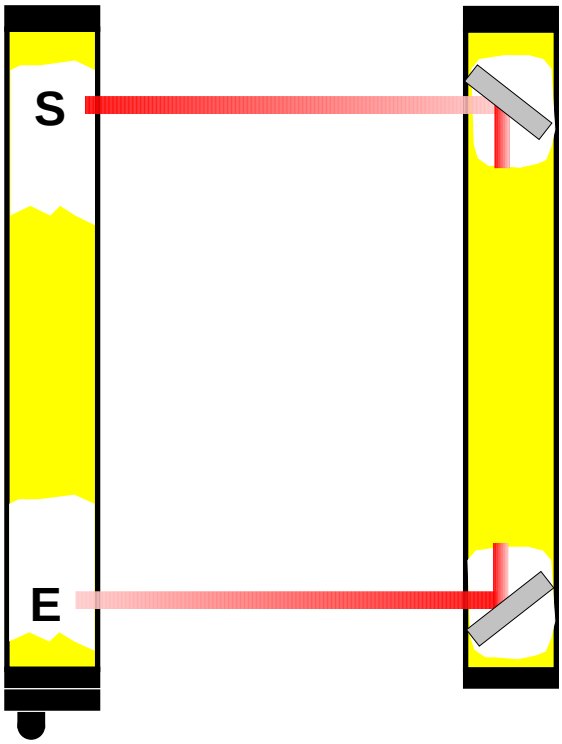
Order code of **cascadable light grid:**
additionally **K** in the type designation

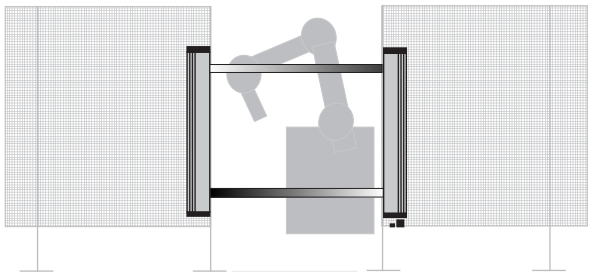
i.e. Type: ULCT-K 300/36

cascadable, to this equipment a standard device or further ascadeable equipment can be attached

Safety class 4 safety light-grid

ULVT 500/2R





- 2 -beam-safety light grid
- Safety cat. type 4 - Performance Level PL e - SIL 3
- simple installation due to active and passive functional units
- protective operation with restart interlock
- cabling on only one side of the unit, plug-in active functional unit
- integrated switching unit : EDM, restart interlock
- 8 m range, 500 mm beam spacing

DIN EN ISO 9001
Reg.Nr. 96007

optional

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features

ULVT 500/2R

The safety light grid ULVT 500/2 R is an electro-sensitive protective device (ESPE) and designed for protection of persons from accidents.

This is realized by protecting the hazardous sites and areas, enabling any access to hazard inhibiting parts of the machine only by crossing the protective field createdby the light barrier.

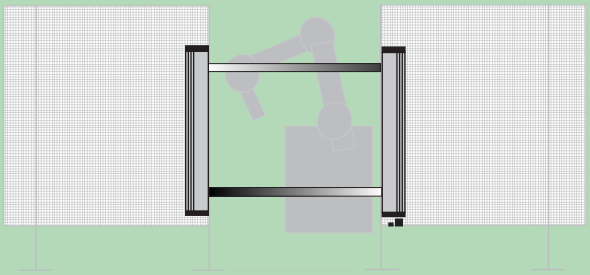
When entering the protective field, the light beams are interrupted and the machine will be reliably stopped.

Safety light grids ULVT 500/2 R are caracterized by:

- examination by the German technical surveyor authorities (TÜV)
- Typ 4, PL e, SIL 3
- built-in self-monitoring device without auxiliary circuitry
- integrated switching unit features valve control, restart interlock
- compact, sturdy structural shape
- simple installation and adjustment
- EEx-P optionally available

application

Application for the ULVT 500/2 R safety light grid:
as protection device at hazardous sites and areas as well as pedestrian access protection, e.g.:



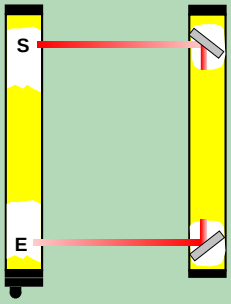
- metal presses for wood, plastic, rubber, leather, glass processing
- filter presses
- folding and bending machines
- injection moulding machines
- machining centres and welding presses
- pick-and-place machines
- robots, palettizers
- protecting storages
- doors and gates etc.

function

The ULVT 500/2 R safety light-grid consits of two components: combined transmitter/receiver unit and mirror unit.

The combination of transmitter and receiver unit in one single housing reduces the expenditure of cabling (electrical connection only on the combined transmitter/receiver unit).

The interruption of the hazardous motion is realized by a discretely built sequential safety circuitry.



technical data

detection range: 8 m

voltage: 24V DC, plug-in connection

response time: 6ms; max. switching current 500mA

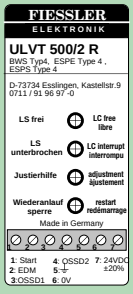
adjustment display and reading of soiling degree integrated in the receiver/ transmitter unit

housing dimensions: 40 x 60 x 650 (length x width x height), plus 50 mm for plug

weight: 3000g

optional: EEx-P

outputs OSSD 1 and 2: fail-safe PNP-outputs, max. 0,5 A
short-circuit and cross-circuit monitoring



FIESSLER ELEKTRONIK

Data sheet

Deflection mirror column ULVT 500/2R range 15m

Mounting column with integrated mirror

For range extension, as passive system of ULVT 500/2R

High range: 15m

Solid floor plate / Easy assembly

With the new mirror as a passive part of the overall system ULVT 500/2R, it is now possible to achieve a much greater range than before.

With larger mirrors, in a still larger column, arranged specifically, it is now possible to achieve a range of 15m with the system ULVT 500/2R, and thus to bridge much greater distance.

DIN EN ISO 9001
Reg.Nr. 96007

LISTED

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Accessories and Spare parts	Order code
14-mm test rod with fastening clips (in case of strong vibrations)	PS 14
30-mm test rod with chain (in case of strong vibrations)	PS 30
Deflecting mirror	USP 100 ... USP 1500
Laser adjustment aid	JHL2
4-pol. M12- **cable connection** / emitter / 5 m Length (Other lengths on request) 	XC/M12/4pol/5m
8-pol. M12-**cable connection** / receiver / 5 m Length (Other lengths on request) 	XC/M12/8pol/5m
4-pol. M12- **extension cable for cascaded light grids** / 2 m Length 	XC/M12/4pol/2m/K
8-pol. M12- **extension cable for cascaded light grids** / 2 m Length 	XC/M12/8pol/2m/K
4-pol. M12 **Round plug connector** Screw terminals 	M12/4/K
4-pol. M12 **Round plug connector** Screw terminals 	M12/8/K
Swivel Mounting for transmitter and receiver (scope of supply) 	-
Slot block (1 piece) (optional) 	NS
Aluminium shackles (optional) 	on request
Metallic fastening rocker for a shackle (in case of strong vibrations)	SM

Standard system

Cascadable light grid

Order code of **standard system**:

i.e. Type: TLCT 100/12

system protective field — beam count

Order code of **cascadable light grid:**
additionally **K** in the type designation

i.e. Type: TLCT-K 300/36

cascadable, to this equipment a standard device or further ascadeable equipment can be attached

Delivery program

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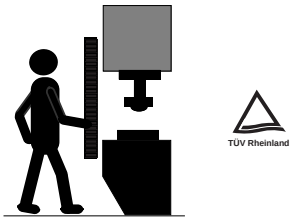
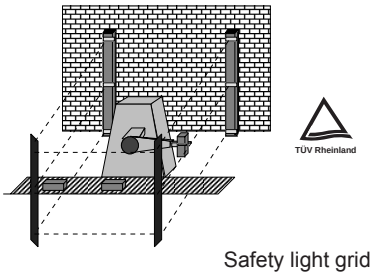
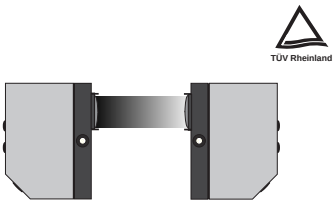


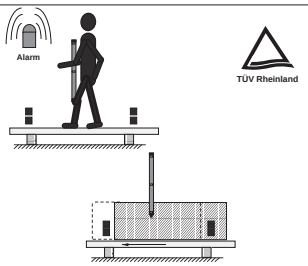
Safety light curtain



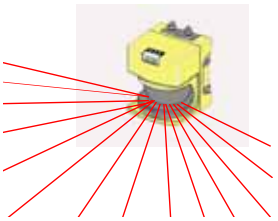
Safety light grid



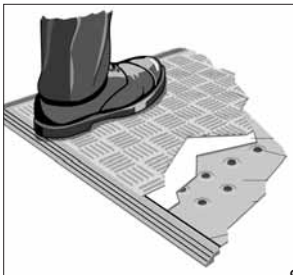
Single safety light beam



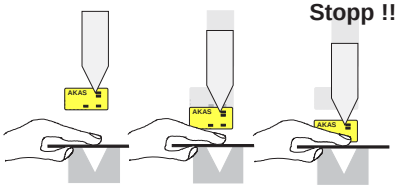
Saftey light grid with muting function



Proximity scanner



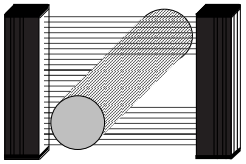
Safety mats



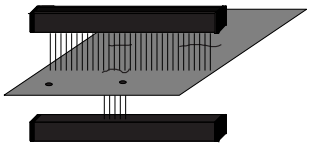
Press brake safety system

Safety foot pedal

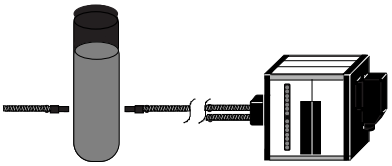
Safety PLC
Safety controllers



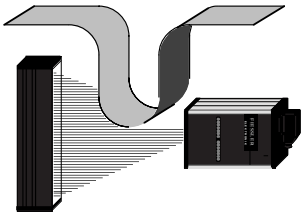
Measuring and controlling light curtains



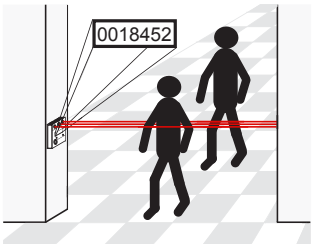
Hole detectors



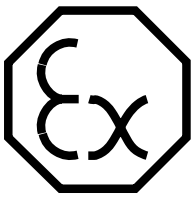
Turbidity sensors

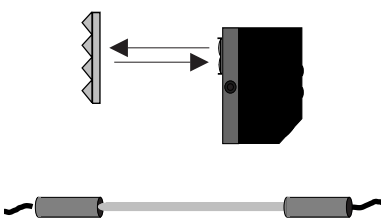


Analogue loop sensors



Counting light barriers





Light barriers for general purposes

Your application

Safety class 4 safety light-grid

ULVT 1200/4R

TÜV

ZERT
DIN EN ISO 9001
Reg.Nr. 96007

4 -beam-safety light grid

simple installation due to active and passive functional units

Typ 4 EN 61496 · PL e ISO 13849 · SIL 3 EN 61508 · Kat. 4 ISO 13849

protective operation with restart interlock

protective operation with restart interlock

optional

plug-in active functional unit

integrated switching unit : valve control, restart interlock

range 10m (op. 12m) , 300 mm beam spacing

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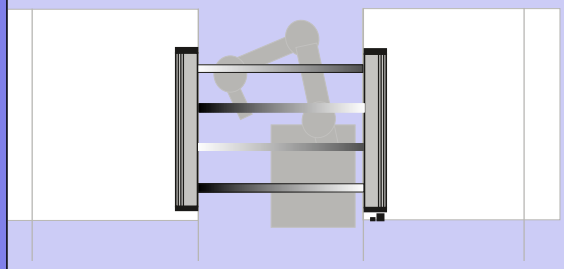
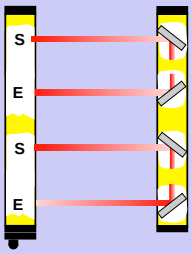
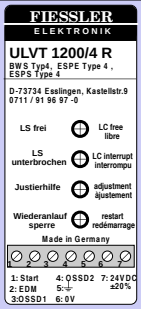
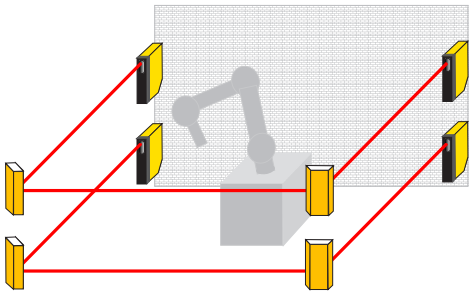
features:	ULVT 1200/4R
	The safety light grid ULVT 1200/4 R is an electro-sensitive protective device (ESPE) and designed for protection of persons from accidents. This is realized by protecting the hazardous sites and areas, enabling any access to hazard inhibiting parts of the machine only by crossing the protective field createdby the light barrier. When entering the protective field, the light beams are interrupted and the machine will be reliably stopped. Safety light grids ULVT 1200/4 R are caracterized by: - examination by the German technical surveyor authorities (TÜV) - compliance with Typ 4, PL e, SIL 3 - built-in self-monitoring device without auxiliary circuitry - integrated switching unit features valve control, restart interlock - compact, sturdy structural shape - simple installation and adjustment - EEx-P optionally available
application:	Application for the ULVT 1200/4 R safety light grid: as protection device at hazardous sites and areas as well as pedestrian access protection, e.g.:
	 - metal presses for wood, plastic, rubber, leather, glass processing - filter presses - folding and bending machines - injection moulding machines - machining centres and welding presses - pick-and-place machines - robots, palettizers - protecting storages - doors and gates etc.
function:	
	The ULVT 1200/4 R safety light-grid consits of two components: combined transmitter/receiver unit and mirror unit. The combination of transmitter and receiver unit in one single housing reduces the expenditure of cabling (electrical connection only on the combined transmitter/receiver unit). The interruption of the hazardous motion is realized by a discretely built sequential safety circuitry. For various protection measures, application-optimized switching units of the LSUW series are available. **Only available in conjunction with vertical columns!** 
technical data:	
	detection range: 10 m (op. 12m) voltage: 24V DC, plug-in connection response time: 6ms; max. switching current 500mA adjustment display and reading of soiling degree integrated in the receiver/ transmitter unit housing dimensions: 40 x 60 x 650 (length x width x height), plus 50 mm for plug weight: 19,68 Kg incl. mirror column optional: EEx-P 

Single beam safety light barrier

EU2K



1 - beam - safety light barrier

Safety category type 4

With 2 m fixed mounted cable or M12 plug

24 VDC or 230 VAC version

optional

30 m max. range

Optional : 100 m range with laser transmitter

DIN EN ISO 9001
Reg.Nr. 96007

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Telefax: +49 (0) 711 / 91 96 97-50 eMail: info@fiessler.de

Features

EU2K

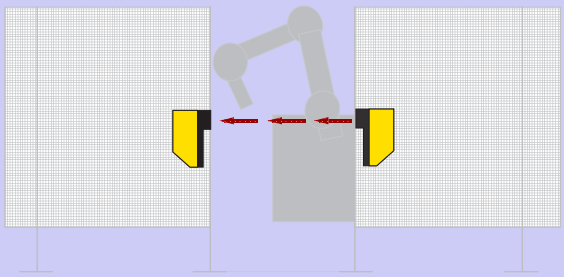
The single beam safety light barrier EU2K is an electro-sensitive protective device (ESPE) and designed for protection of persons from accidents. This is realized by protecting the hazardous sites and areas, enabling any access to hazard inhibiting parts of the machine only by crossing the protective field created by the light barrier. When entering the protective field, the light beams are interrupted and the machine will be reliably stopped.

Single beam safety light barriers EU2K are characterized by:

- examination by the German technical surveyor authorities (TÜV)
- approval by the German employer's liability insurance association (BG)
- compliance with safety category 4, EN61496
- built-in self-monitoring device without auxiliary circuitry
- compact, sturdy structural shape- simple installation and adjustment
- option: EEx-P.

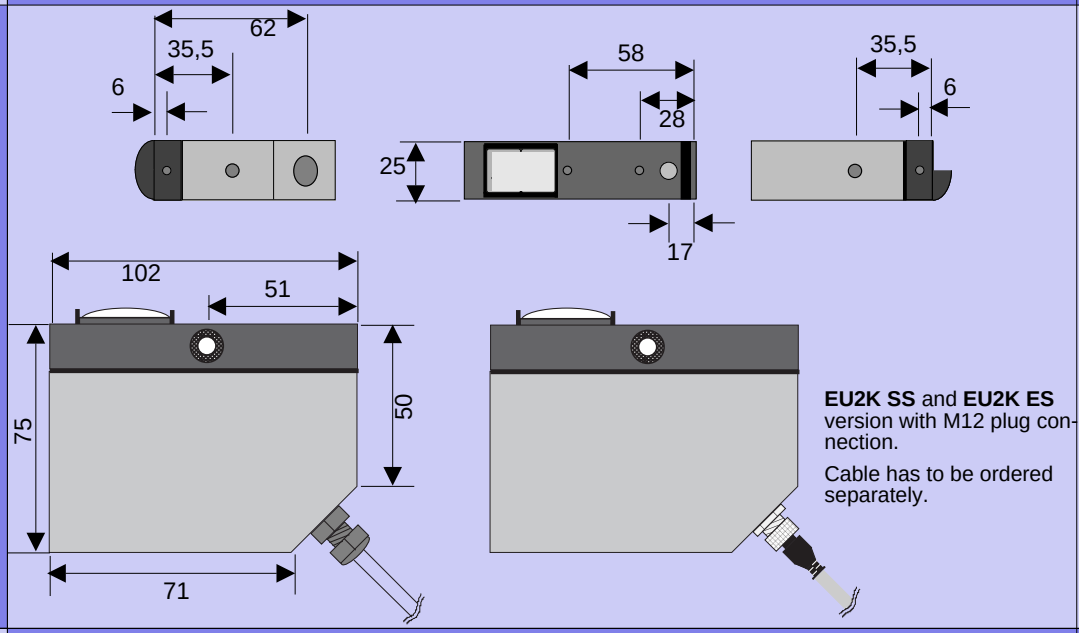
Application

Application for the EU2K safety light-grid: as protection device at hazardous sites and areas as well as pedestrian access, i.e.:



- metal presses for wood, plastic, rubber, leather, glass processing
- filter presses- folding and bending machines
- injection moulding machines
- machining centres and welding presses
- pick-and-place machines
- robots, palettizers
- protecting storages- doors and gates etc

Dimension



EU2K SK and **EU2K EK** version with 2m fixed mounted cable

EU2K SS and **EU2K ES** version with M12 plug connection.

Cable has to be ordered separately.

Technical data

detection range: up to 30 m optional: 100m range with laser transmitter
Voltage: 230V AC / 24V DC, optional 24V DC / 24V DC
Switching time: 12ms; max. switching current 500m
Adjustment display and reading of soiling degree integrated in the receiver
unithousing dimensions: 25x75x102 (length x width x height)
weight: 400g
optional: EEx-P

outputs OSSD 1 and 2: fail-safe PNP-outputs, max. 0,5 A short-circuit monitoring

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D

FIESSLER ELEKTRONIK

Selection table --> Safety -light curtain /-light grid

FIESSLER ELEKTRONIK

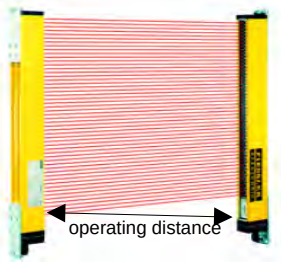
Safety category	housing B x T (mm)	resolution (mm) range (m) finger protection	resolution (mm) range (m) hand protection	resolution (mm) range (m) body protection	resolution (mm) range (m) body protection	resolution (mm) range (m) body protection	resolution (mm) range (m) access protection	resolution (mm) range (m) access protection	protection field (mm) 100 mm steps Sepecial protection field height available by demand	Characteristics: EDM -external device monitoring select. / RES - restart interlock select. / cascadable / Blanking functions / reduced resolution / Muting functions / PSDI mode 1 - 4 stroke / relay output optional / emergency stop circuit monitoring / limit switch monitoring	Identification saftey light curtain
Category 4 SIL 3 (EN 61508) Performance Level PL e EN 954-1 and 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	400 0-24 / 6-30 / 6-60	500 0-24 / 6-30 / 6-60	100 - 1900	✓ ✓ ✓ 1) 3) 5) 3) 3)	**ULVT**
	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	400 0-24 / 6-30 / 6-60	500 0-24 / 6-30 / 6-60	100 - 1900	✓ ✓ ✓ ✓ ✓ 1) 3) 5) 3) 3)	**BLVT**
	25 x 35	14 0-5	30 0-5						100 - 1500	✓ ✓ ✓ 2) 4) 6) 4) 4)	**ULCT**
	25 x 35	14 0-5							100 - 1500	✓ ✓ ✓ ✓ ✓ 2) 4) 6) 4) 4)	**BLCT**
Category 2 SIL 1 (EN 61508) Performance Level PL c EN 954-1 and 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	400 0-24 / 6-30 / 6-60	500 0-24 / 6-30 / 6-60	100 - 1900	✓ ✓ ✓ 1) 3) 5) 3) 3)	**TLVT**
	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	400 0-24 / 6-30 / 6-60	500 0-24 / 6-30 / 6-60	100 - 1900	✓ ✓ ✓ ✓ ✓ 1) 3) 5) 3) 3)	**ILVT**
	25 x 35	14 0-5	30 0-5						100 - 1500	✓ ✓ ✓ 2) 4) 6) 4) 4)	**TLCT**
	25 x 35	14 0-5							100 - 1500	✓ ✓ ✓ ✓ ✓ 2) 4) 6) 4) 4)	**ILCT**

Identification saftey light curtain

user friendly and efficient

- compact housing
- integrated control box
- ULVT / BLVT with terminal board for standard cable
- ULCT / BLCT with M12 plug connection
- 7 digit display

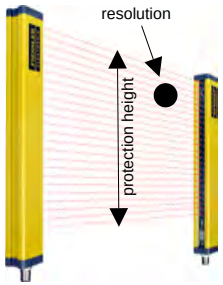
1) with Snap-on Muting controller PLSG1 up to PLSG 3 or DIN rail mounted PLSG1K up to PLSG3K or safety PLC FPSC
2) with DIN-rail mounted Muting controller PLSG1K up to PLSG3K or safety PLC FPSC
3) with Snap-On compact safety controller or DIN rail mounted PLSG3K or safety PLC FPSC
4) with compact safety controller for DIN rail mounting PLSG3K or safety PLC FPSC
5) with Snap-On relay output module LSRA or power supply ULSG or Fiessler safe contact expander module FSEM
6) with power supply ULSG or Fiessler safe contact expander module FSEM



ULVT - BLVT
TLVT - ILVT

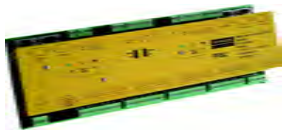
Snap-On safety Muting controller
PLSG1/ PLG2
Snap-On compact safety controller PLSG 3

Self supporting columns



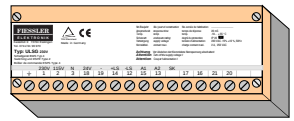
ULCT - BLCT
TLCT - ILCT

Safety Muting controller
PLSG1K/ PLG2K
Compact
safety controller PLSG3K
for DIN rail mounting



Safety PLC
Programmable Safety Centre
FPSC

Snap-On relay output module
LSRA



Power supply with potential free relay outputs
ULSG

CE TÜV UL LISTED ZERT Ex optional

Sales agencies - Germany

Office south wes	fiessler.suedwest@fiessler.de
Office west	fiessler.west@fiessler.de
Office north	fiessler.nord@fiessler.de
Office east	fiessler.ost@fiessler.de
Office south east	fiessler.suedost@fiessler.de
Office Bavaria	fiessler.bayern@fiessler.de

Sales agencies - world wide

World wide	see www.fiessler.de

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www.fiessler.de

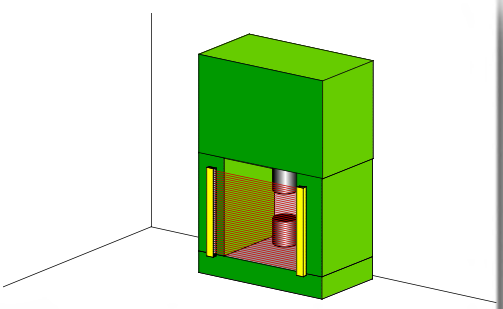
Please use the large-scale download possibilities

FIESSLER ELEKTRONIK

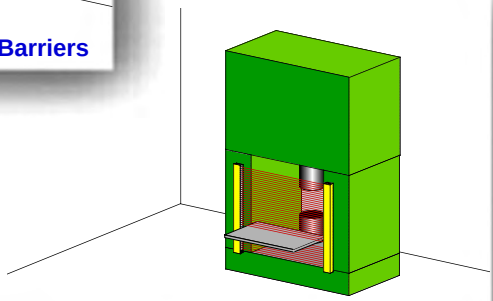
Safety-light curtains
Safety-light grids
TLVT / ILVT

user-friendly
economically

- model 40x60mm
- integrated controller
- large range up to 60 m
- cascadable
- Blanking function
- with terminals for the use of standard cable



Multi-Beam Safety Light Barriers

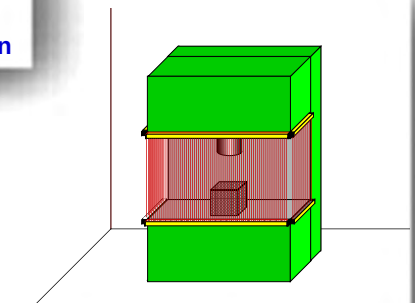


With Blanking Functions

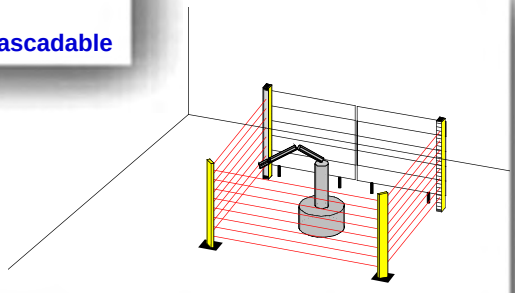
Safety For All Applications*

*** Expert advice and information for the reliable integration of our safety equipment in your machine!**

Safety Light Curtain



Cascadable



Safety Light Grids

Typ 2 EN 61496
PL c ISO 13849
SIL 1 EN 61508
Kat. 2 ISO 13849

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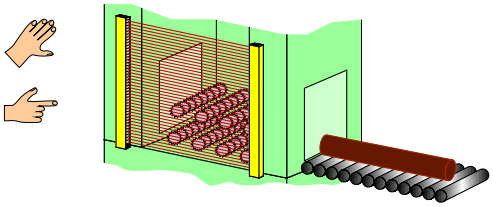
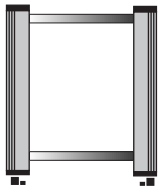
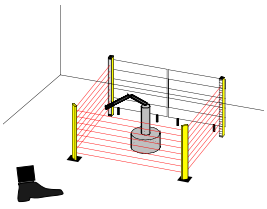
Application examples



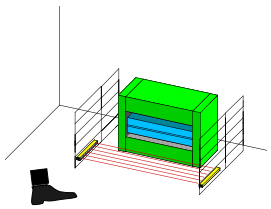
Light Curtains for the protection of dangerous sites. Protectuon of fingers or hands.



Pedestrian access units. Guarding by Safety Light Grids, body protection.



Pedestrian access units. Guarding by Safety Light Grids, body protection.



Fencing off of accessible areas by horizontally positio-ned light curtain

Type description

The optimized safety light curtains of the TLVT series are available for all applications:

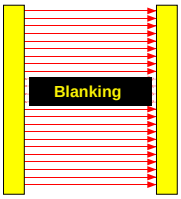
TLVT	Protection of fingers, hands, or pedestrian access guard	Resolution 14 - 500 mm	Typ 2, PL c, SIL 1
ILVT	Protection of Fingers, hands, or pedestrian access guard w. blanking function,	Resolution 14 - 500 mm	Typ 2, PL c, SIL 1
cascading	All safety light curtains available for connection in segments	Resolution 14 - 500 mm	Typ 4-2, PL e-c, SIL 3-1

Terminology

Light curtains:	safety light curtains for protection of fingers or hands. Beam spacing 14mm or 30 mm.
Blanking function:	controlled blanking of light beams to disable selected, fixed areas in the protective field.
Safety light grids:	same as safety light curtains, but especially for personal protection as pedestrian access unit. Beam spacing ≥100 mm
Beam spacing:	distance between adjacent light beams. In order to enable a reliable stop of the machine, at least 2 beams must be interrupted completely.
Resolution:	see also "minimum obstacle diameter". Reference testing measure for safe responding of the light curtain.
ESPE type 2:	Safety class with cyclic test of the saftey light curtain. Error will be detected only during the test, integrated test unit, external test is not necessary.
Cascading:	For protecting a hazardous area on more than one side, up to 3 light curtains may be connected in series.

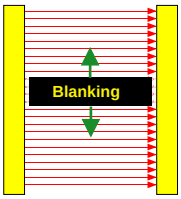
Examples For Blanking Functions

There are 11 different blanking patterns to choose from. Progamming these patterns is very easy



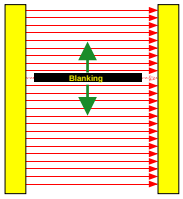
Fixed Blanking

The presence of rigid (fixed) machine parts that perma-nently reach into the protec-tive field of the light curtain must be blanked.
Full protection for the remain-der of the protective field.



Floating Blanking

The presence of moving machine parts that perma-nently reach into the protec-tive field of the light curtain must be blanked.
Full protection for the remain-der of the protective field.



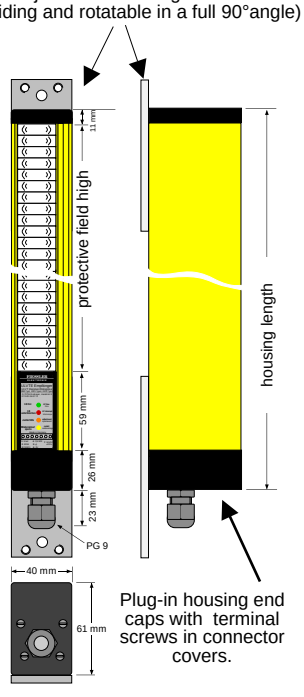
Skip 1 Beam Once

The covering of only one beam that is located at any random position within the protective field, is ignored.
application example:
blanking of a metal sheet at press brakes.

Design

The safety light curtains of the ...LVT series consist of two components: transmitter and receiver. Their detection range is defined by the distance between the transmitter and the receiver; their pro-tective height depends on their individual constructional height (overall height). Therefore, the pro-tective field is defined by both protective height and detection range.
Protective heights from 100mm up to 1900 mm are available because of their modular design. On demand, construction of special units for intermediate-sized application is possible.

Fastening brackets for easy mounting and adjustment of the light curtain. (Sliding and rotatable in a full 90°angle)



Plug-in housing end caps with terminal screws in connector covers.

Function

The transmitter generates infra-red chopped light beams. The parallel light beams are monitored by micro-controllers. The receiver evaluates the arriving beams in synchronous action to the transmit-ter.
Due to the beam spacing, a resolution of 14 mm / 30 mm is achieved. If an object is introduced into the protective field, , i.e. if at least one of the light beams is interrupted, both receiver outputs inter-rupt the hazardous movement of the machine at once, and a restart of the machine is reliably pre-vented.

Response Time

The safety light curtains of the ...LVT series are characterized by the special short response times.

This reduces the safety distance between the light curtain and the dangerous area.

	basic response time	response time per receiver segment
TLVT	4,3 ms	0,084 ms
ILVT	5,5 ms	0,126 ms
cascaded light curtain	response time main sensor + 3ms for each secondary sensor	

Available standard sizes

Protective height (mm)	Con-struc-tional Height L(mm)	Finger protection	Hand protection	Access protection	Access protection	Access protection	Access protection	Access protection
		Resolution 14 mm **Number of beams**	Resolution 30 mm **Number of beams**	Resolution 100 mm **Number of beams**	Resolution 200 mm **Number of beams**	Resolution 300 mm **Number of beams**	Resolution 400 mm **Number of beams**	Resolution 500 mm **Number of beams**
v	v	Range 7 m / 10 m	Range 24 m / 30 m	Range 24 m / 30 m	Range 24 m / 30 m	Range 24 m / 30 m	Range 24 m / 60 m	Range 24 m / 60 m
100	196	13	7	-	-	-	-	-
200	296	26	14	3	2	-	-	-
300	396	39	21	4	-	2	-	-
400	496	52	28	5	3	-	2	-
500	596	65	35	6	-	-	-	2
600	696	78	42	7	4	3	-	-
700	796	91	49	8	-	-	-	-
800	896	104	56	9	5	-	3	-
900	996	117	63	10	-	4	-	-
1000	1096	130	70	11	6	-	-	3
1100	1196	143	77	12	-	-	-	-
1200	1296	156	84	13	7	5	4	-
1300	1396	169	91	14	-	-	-	-
1400	1496	182	98	15	8	-	-	-
1500	1596	195	105	16	-	6	-	4
1600	1696	208	112	17	9	-	5	-
1700	1796	221	119	18	-	-	-	-
1800	1896	234	126	19	10	-	-	-
1900	1996	247	133	20	-	-	-	-

Protective height: by demand special protective height are available

Order code: example type (**TLVT**)-protective height(**500**)-/number of beams(**35**) — **TLVT500/35**

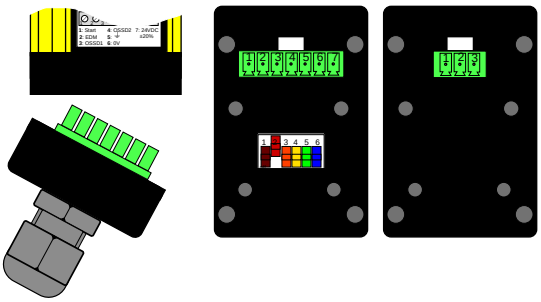
Order code: example type (**ILVT**)-protective height((**500**)-/number of beams((**35**) — **ILVT500/35 (with blanking function)**

Integrated switching unit

The ESPE safety type 2 requires the restart interlock and valve/ contactor control. These characteristics are integrated standard features of the receiver head of the light curtain. Therefore, for the safe operation no additional switching unit is necessary.
The testable category 2 light curtains required a cyclic system test.
With TLVT / ILVT light curtains this is no longer necessary, because a continuous internal self-testing is active

Operational modes

The required operational mode is user-friendly selected via dip-switches. There is no need of a computer for programming.

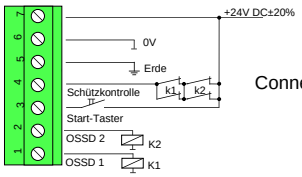


Integrated plug-in connection in the connection lid

The standard equipment of the product series ...LVT includes an extra flat plug-in connection with screw nut located in the connection lid. This lid may be removed without disconnecting the cable. The housing itself remains sealed.
Several standard connection-plugs are available as options.
The transmitter is connected via a 3-core cable, the receiver is connected via a 5- to 7-core cable (required according to the mode of operation).

Contactors/valves directly connectable

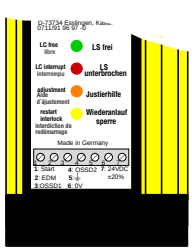
The switching capacity of 0,5 A / 24 VDC of both fail-safe outputs (OSSD1 und OSSD2) permits the direct connection of contactors or valves.

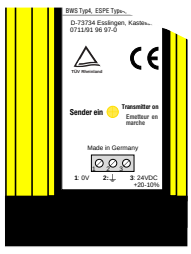


Connection Example for TLVT

LED displays

Several LEDs located at the receiver and transmitter heads provide precise and clear indication of the current operating status, such as interruption of the protective field, soiling, start requiring signal, or faults.





Self-Diagnostics Device

If the self-testing of the system detects an internal or external error, the machine will be switched off immediately. The internal or external error will be displayed by the flashing of the LEDs located on the transmitter, respectively on the receiver panel.
An error-diagnostic appliance is available, which enables the exact localization of the errors on the spot. When a fault is detected, the flashing LEDs provide the visual output of the detected fault and display in the diagnostics device.

Accessories

All light curtains are delivered with the necessary plugs and come with adjustable fastening brackets.

For their installation in an open area (e.g. for a multi-sided screening, or protection through tilted mirrors), the units can be supplied as pre manufactured assembly columns.

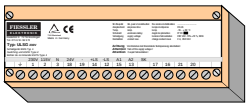
For the precise alignment of the TLVT light barriers, particularly where large distances or screening through tilted mirrors are involved, a battery powered adjustment laser is available. The device is attached to the front panel of the transmitter. A laser beam which is visible even in broad daylight, shows the direction of the beams coming from the transmitter, thereby providing the most accurate adjustment of the light curtain.

Additional functions

Optional there safety controller available for additional functions such as relay output or Muting: e.g. snap-on realy output module LSRA, power supply with potential free relay outputs ULSG, compact safety controller PLSG1k -PLSG3k for DIN rail mounting, The programming of all these devices is possible without PC.

Safety Muting controller
PLSG1K/ PLG2K
Compact
safety controller PLSG3K
for DIN rail mounting

Safety PLC
Programmable Safety Centre
FPSC



Power supply with
potential free relay outputs
ULSG

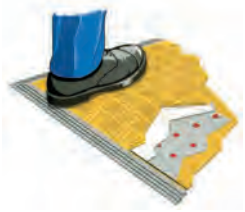
Snap-On relay
output module
LSRA-T

Other safety equipment

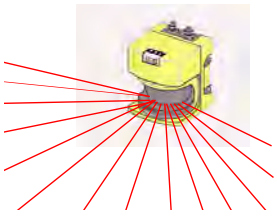
Apart from the above mentioned light curtains and light grids, Fiessler Elektronik provides other components for the protection of your work places.

Service

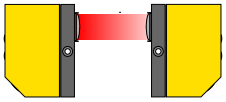
As a special feature for training our customers, Fiessler Elektronik offers one-day safety workshops. Our service team provides you with expert advice and information for the reliable integration of our safety equipment into your machine.



Safety mats

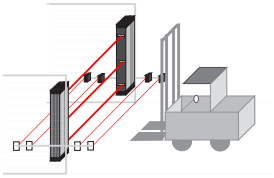


Proximity laser scanner



Single-beam safety light barriers with extra large detection range

Press brake protection system AKAS



Distinguishing man from machine due to special muting applications

HOMOLOGATIONS

In order to ensure and maintain the high quality level of the Fiessler safety products, a quality control security system has been established early. Fiessler Elektronik holds the DIN ISO EN 9001 Certificate and, thanks to the company-owned EMC laboratory, all products must pass an inspection without exception before they leave the company. All safety equipment comply with the applicable national and international standards. Development and Design is made in close co-operation with the German employer`s liability insurance associations. All homologations are obtained only after having passed strict tests by the German surveyor organisation TÜV.

CE BG zugelassen TÜV ZERT UL LISTED Ex

Award of appreciation

for exemplary performance in the development of the press brake protection system AKAS.
The award was bestowed upon Fiessler Elektronik by the ministry of trade and commerce of the federal state of Baden-Württemberg.

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Fiessler Elektronik has respresentations in all major industrial nations.

FIESSLER ELEKTRONIK

Data sheet

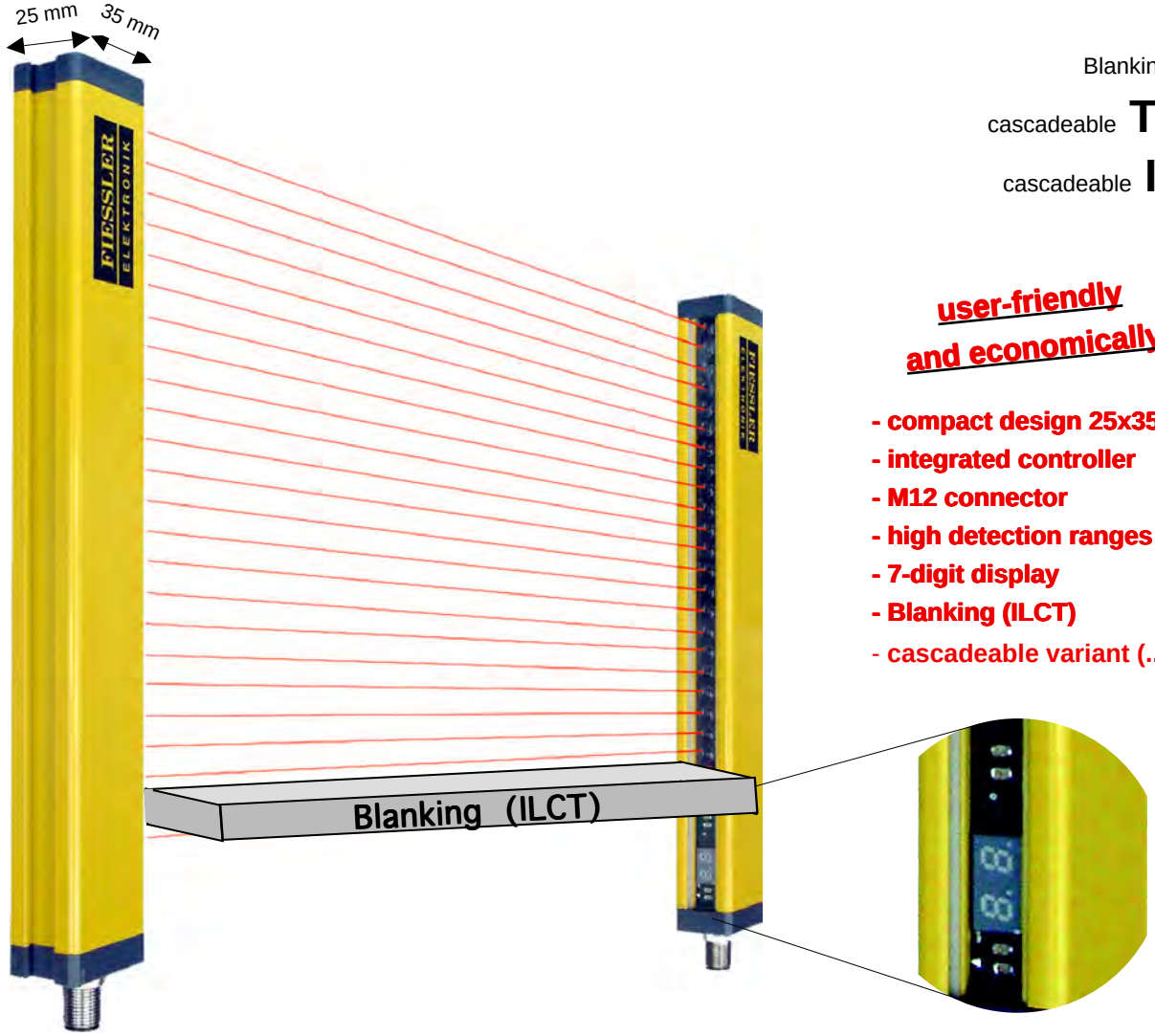
Compact Safety Light Curtains

TLCT

Blanking **ILCT**

cascadeable **TLCTK**

cascadeable **ILCTK**



user-friendly and economically

- **compact design 25x35mm**
- **integrated controller**
- **M12 connector**
- **high detection ranges**
- **7-digit display**
- **Blanking (ILCT)**
- cascadeable variant (...LCTK

Safety cat. type 2 - SIL 1 - Performance Level PL c

Finger and hand protection (14 mm / 30 mm resolution)
11 Blanking modes (ILCT)

integrated controller
-selectable valve control and restart interlock

connection via M12 connector / 7-digit display

optional

compact design 25 x 35 mm with flexible swivel mounting

compact design 25 x 35 mm with flexible swivel mounting

protection heights until 1500 mm in steps of 100 mm

TÜV

ZERT DIN EN ISO 9001 Reg.Nr. 96007

Typ 2 EN 61496 · PL c ISO 13849 · SIL 1 EN 61508 · Kat. 2 ISO 13849

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Features:

- **Safety category 2**
  (EN 954-1 und 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
- Directly controllable contactors / valves
  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
- Protective field heights: 100 mm - 1500 mm
- Short reaction times: TLCT 4 ms - 20 ms, ILCT 7 ms - 29 ms
  depending on the length; correspondingly short safety clearances
- Semiconductor outputs with short-circuit and cross-connection monitoring
- Blanking (ILCT)

Areas of application:

Safeguarding of hazard zones,

Protection of fingers and hands, e.g. when operating:

- Wood working machines
- Packaging machines
- Textile machines
- Stock and logistic technologies
- Automatic placement machines
- Round table machines
- Pallettizers

Design and function

TLCT / ILCT safety light curtains consist of two components: Light transmitter and light receiver. The clearance between these two components and the installation height determine the width and height of the protective field.

Their modular design permits a realisation of protective field heights ranging from 100 mm to 1500 mm in 100-mm steps.

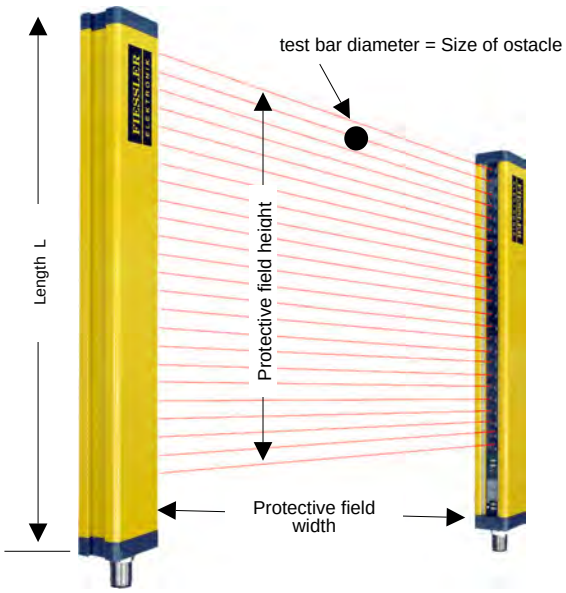
The transmitter generates infrared light beams in rapid pulses. These parallel light beams are analysed by two single-chip controllers in the transmitter. The beam spacing determines the resolution.

If an object enters the protective field, i.e. if at least one light beam is interrupted, the receiver's two outputs stop the machine or prevent it from starting, thus avoiding hazards.

In the restart with interlock operating mode, the machine can only be restarted by means of the start button once the protective field has been cleared again.

Userfriendly integrated cyclic test: The testable category 2 light curtains required a cyclic system test. With TLCT / ILCT light curtains, this is no longer necessary, because a continuous internal self-testing is active

Overview table		TLCT / ILCT	TLCT
		Finger protection Resolution: 14 mm	Hand protection Resolution: 30 mm
		Range: 5 m	Range: 5 m
Protective field height (mm)	Length L (mm)	no. of beams	no. of beams
100	161	12	4
200	261	24	8
300	361	36	12
400	461	48	16
500	561	60	20
600	661	72	24
700	761	84	28
800	861	96	32
900	961	108	36
1000	1061	120	40
1100	1161	132	44
1200	1261	144	48
1300	1361	156	52
1400	1461	168	56
1500	1561	180	60



Swivel Mounting (Scope of supply)

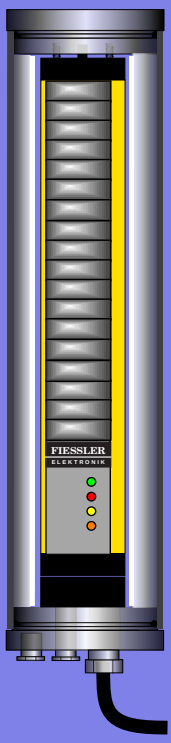
lateral mounting

rear mounting

Characteristics	TLCT… / ILCT…	
safety class	Type 2 according to IEC 61496, Cat. 2 and PL c according to EN ISO 13849-1, SIL 1 acc. to IEC 61508/62061	
protective heights	100 mm … 1500 mm	
protective width (max. detection range)	0 … 5 m	
resolution	smallest obstacle recognition from 14 mm / 30 mm	
response time	**TLCT**: 4 - 20 ms, **ILCT**: 7 - 29 ms, depending on length - smallest safety distance due to short response times	
self-diagnosis	microcontroller monitoring of the safety functions (self-monitored) fault indication by 7-digit display	
operation modes	- with / without restart interlock - with / without contactor control (EDM) - **11 blanking modes (ILCT)** - **cascadeable variant (...LCT-K)**	**with optional safety switching units PLSG...K**: - Muting - cycle mode 1-cycle to 4-cycle (during inserting work) - Monitoring Emergency off and protective doors - potentialfree switching contacts - programming the blanking (for ILCT)
Mechanical data		
fastenings	- hinge fastening (swivel mounting) at the upper and lower side of the light barrier for fine adjustment - sliding fastening brackets with adjustment screws at rear side of housing - flexible fastening by sliding T-blocks	
housing	Aluminium profile 25x35mm, plastic-coated RAL 1021 yellow. End pieces made from non-corrosive spherically reinforced plastic (polyamide). Plexiglass light outlets and inlets.	
Operating data		
protection category	IP 65	
protection class	III	
operating ambient temperature	-10 to 55 °C	
storage temperature	-25 to 70 °C	

Electric data	transmitter TLCT-S / ILCT-S	receiver TLCT-E / ILCT-E
power supply	24 V DC SELV, + 20 % - 15 %	24 V DC SELV, ±20%
current draw	max. 250 mA	max. 250 mA (no load)
outputs	-	OSSD 1 and 2: fail-safe PNP-outputs, max. 0,5 A short-circuit and cross-circuit monitoring
inputs	-	contactor control and Start button 0 V bis 24 V DC ±20%, 10mA
electric connection	M12 connector 4-core	M12 connector 8-core.

Application



With the classification "protected enclosure" according EN 50014 and EN 50016 inside of an EEx-p housing an over pressure will be generated by forcing in air or an inert gas. It serves to prevent the ingress of the surrounding atmosphere, which may consist of a potentially explosive gas mixture.

The protected enclosure will be purged by forcing air or inert gas with a volume 5 times of the housing volume for removing all of the hazardous gas before energising the safety light curtain xLVT/ xLCT.

In a situation where the inside pressure of the housing falls below 0,5 mbar, all components of the safety light curtain will be shut off by the control unit.

In combination with the EEx-p control system, the safety light curtain with protected enclosure can be used in zones 1,2,21 and 22.

The control unit can be operated with 12VDC, 24VDC, 24VAC, 110VAC, 120VAC, 230VAC,250VAC, 48 ...62 Hz.

In case of decrease of pressure, the normally open contact of the relay will be open. The complete power supply for the safety light curtain will be shut off.

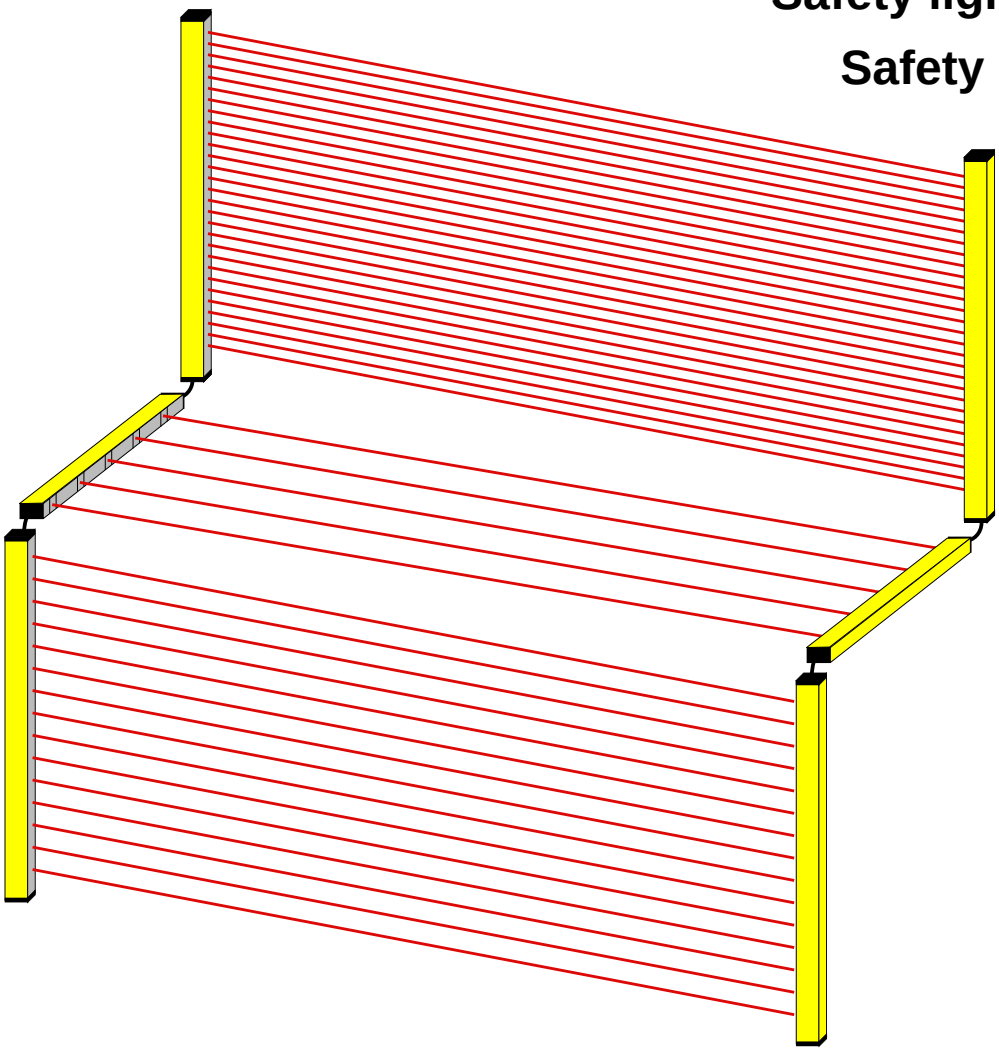
The system xLVT....EEx-p consists of xLVT transmitter , xLVT receiver and EEx-p controller.

Additionally, both housing covers have connections for pressure air hoses.

Technical data

Ex-protection:	according ATEX 94/9 / ATEX 95 inside an EX-zone Zone 1 or 2 II 2G EEx e m ia [p] [ia] IIC T4 oder II 2G EEx d m ia [p] [ia] IIC T4
Protection type:	control unit IP 65 , safety light curtain IP 67
Power consumption:	2.0 VA, without external consumer
Supply voltage:	12VDC, 24VDC and 24VAC, 110VAC, 120VAC, 230VAC, 250VAC, 48 ...62 Hz
Operating current:	terminal 6, 7, 8, 9 AC: U =250VAC, I = 12,0 Amp with cos ö =1 DC: U= 30VDC, I = 3,0 A
Pressure measurement range:	0 ... 25,0 mbar
Flow measurement range:	0,2 m3/h - 40 m3/h
Ambient operating temp.:	-30°C...+60°C (T4)
Storage temperature:	–40°C...+70°C,non condensing
Purging time:	0... 99 Min. in steps of 1 second

Cascading of
Safety light curtains
Safety light grids



ULVT, BLVT, TLVT and ILVT can be combined in a cascade

ULCT, BLCT, TLCT und ILCT can be combined in a cascade

Finger-, hand- and body protection can be combined in a cascade

Type 4 and 2 , PL e and C, SIL 3 and 1 can be combined in a c

optional

no limitation in number of beams

short response time

up to 10m cable length between each unit in the cascade

DIN EN ISO 9001
Reg.Nr. 96007

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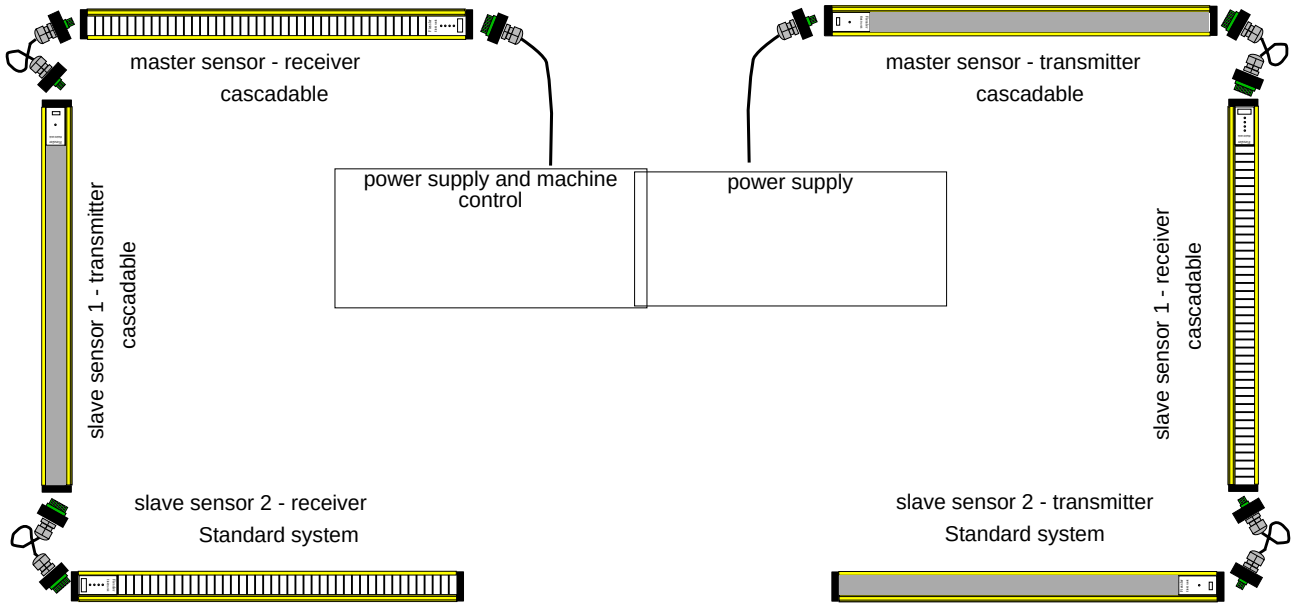
Components

All standard sizes and resolution types of the light grids of the **ULVT** and **BLVT** series (category type 4) as well as those of the **TLVT** and **ILVT** (category type 2) series are available as cascadable light grids and can be combined with each other.

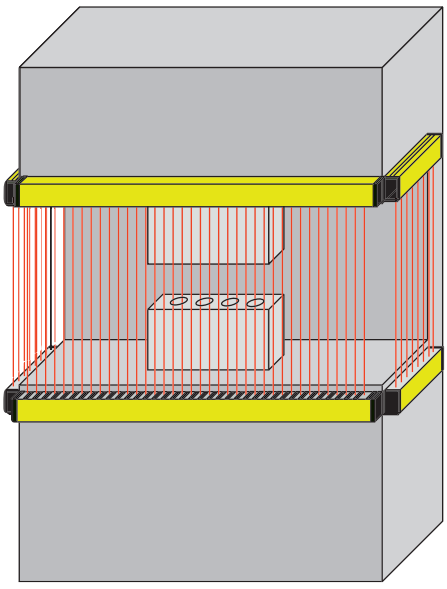
Wiring

The cascading of the light curtains considerably reduces the wiring expenditure. Only the master-sensor receiver is connected to the machine control and stops the dangerous movement.
Only the master sensor transmitter is connected to the main power supply.

The cable length between the cascaded light curtains must not exceed 10 m.



Application excamples:

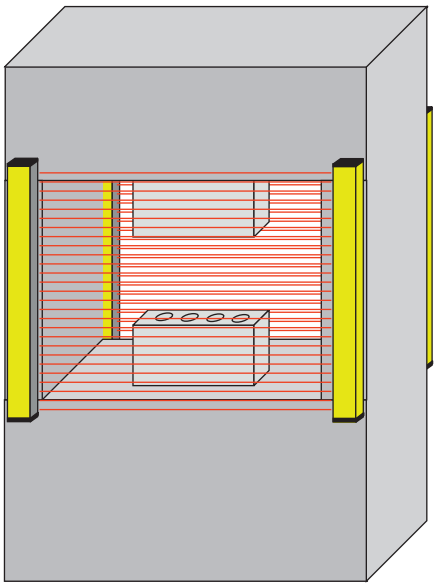


Protection at a C-Press

a) Protection at the 3 sides of a C-press without the obstacles of vertical tilted mirrors .

b) Protection against walking behind the light curtain

c) Protection at the rear side of the press



Protection at the rear of the press

How to utilize and combine the light grids
All standard sizes and resolution types of the light grids of the ULVT and BLVT series (category 4) as well as those of the TLVT and ILVT (category 2) series are available as cascadable light grids and can be combined with each other. If you combine categories 2 and 4 : please refer to the safety instructions.

ULVT -Type 4 Safety light curtain
BLVT -Type 4 Safety light curtain with blanking function (blanking and reduced resolution)
TLVT -Type 2 Safety light curtain
ILVT -Type 2 Safety light curtain with blanking function (blanking and reduced resolution)

available protective fild high and resolution for all systems:

Protective height (mm)	Resolution 14 mm Number of beams	Resolution 30 mm Number of beams	Resolution 100 mm Number of beams	Resolution 200 mm Number of beams	Resolution 300 mm Number of beams	Resolution 400 mm Number of beamsl	Resolution 500 mm Number of beams
100	13	7	2	-	-	-	-
200	26	14	3	2	-	-	-
300	39	21	4	-	2	-	-
400	52	28	5	3	-	2	-
500	65	35	6	-	-	-	2
600	78	42	7	4	3	-	-
700	91	49	8	-	-	-	-
800	104	56	9	5	-	3	-
900	117	63	10	-	4	-	-
1000	130	70	11	6	-	-	3
1100	143	77	12	-	-	-	-
1200	156	84	13	7	5	4	-
1300	169	91	14	-	-	-	-
1400	182	98	15	8	-	-	-
1500	195	105	16	-	6	-	4
1600	208	112	17	9	-	5	-
1700	221	119	18	-	-	-	-
1800	234	126	19	10	-	-	-
1900	247	133	20	-	-	-	-

The **Master sensor** and the light grid in the middle must each be cascadable light grids. **Cascadable** light grids always require a secondary ("slave sensor") light grid, therefore the **cascadable** light grids are not to be used as stand-alone light grids.

In the cascade, the **last secondary light grid** is always a standard light grid. This can also be used as a **stand-alone light grid**.

Order codes: (examples)

1. Cascading of 2 light curtains

Safety light grid with protection height 1300 mm, 14 mm resolution — Master sensor: cat. 4
Safety light grid with protection height 400 mm, 30 mm resolution — slave sensor: cat. 4

		System	Protective height	/ number of beams
Order code:	master sensor:	ULVT-K	1300	/169
Order code:	slave sensor:	ULVT	400	/28

2. Cascading of 3 light curtains

Safety light grid with protection height 800 mm, 400 mm resolution — Master sensor: cat. 4
Safety light grid with protection height 1200 mm, 14 mm resolution — Slave sensor 1: cat. 4
Safety light grid with protection height 400 mm, 30 mm resolution — Slave sensor 2: cat. 4

		System	Protective height	/ number of beams
Order code:	master sensor:	ULVT-K	800	/3
Order code:	slave sensor 1:	ULVT-K	1200	/156
Order code:	slave sensor 2:	ULVT	400	/28

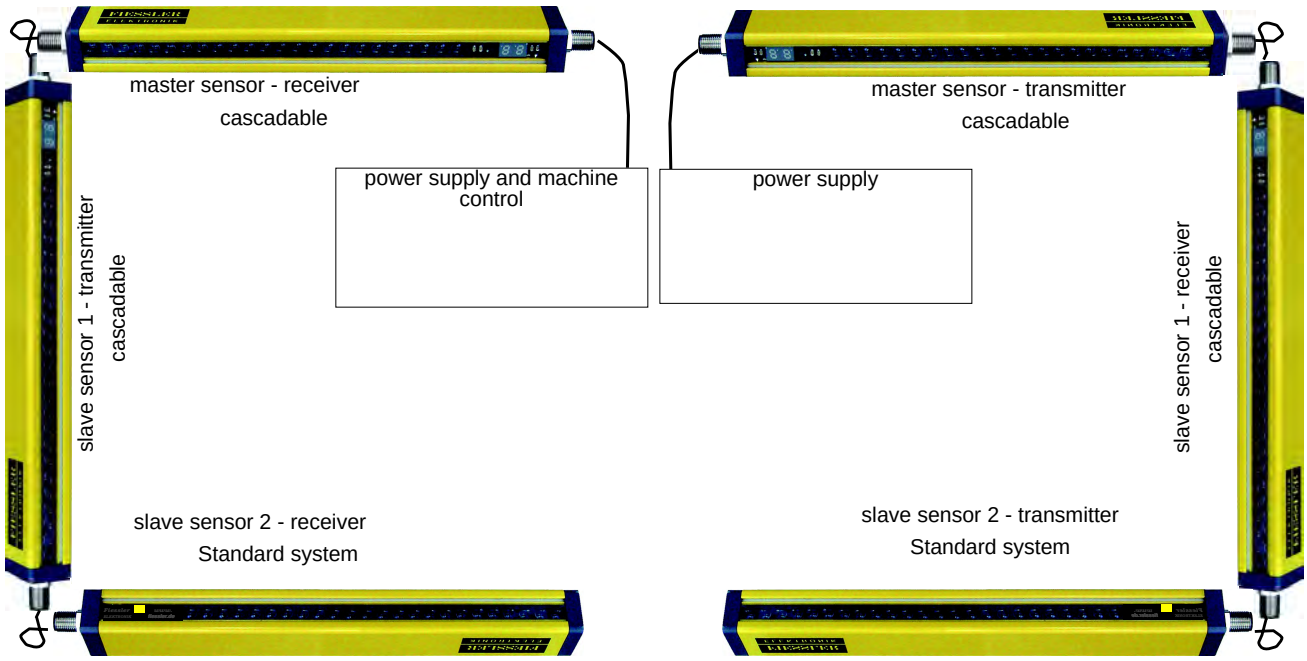
Components

All standard sizes and resolution types of the light grids of the **ULCT** and **BLCT** series (category type 4) as well as those of the **TLCT** and **ILCT** (category type 2) series are available as cascadable light grids and can be combined with each other.

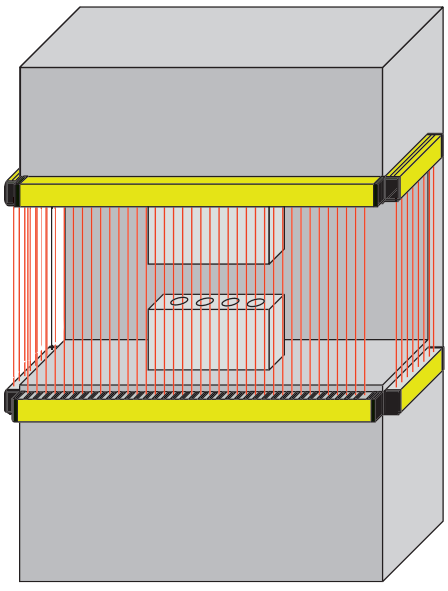
Wiring

The cascading of the light curtains considerably reduces the wiring expenditure. Only the master-sensor receiver is connected to the machine control and stops the dangerous movement.
Only the master sensor transmitter is connected to the main power supply.

The cable length between the cascaded light curtains must not exceed 10 m



Application excamples:

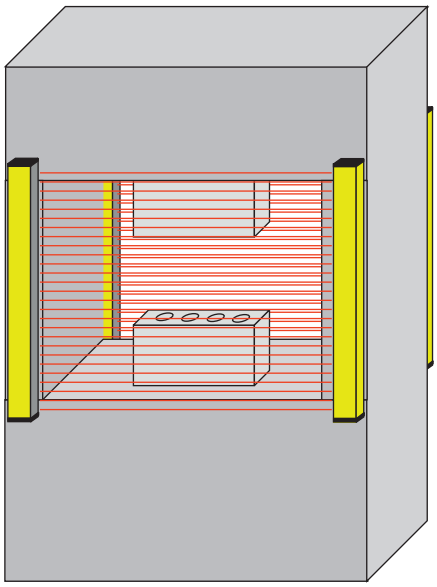


Protection at a C-Press

a) Protection at the 3 sides of a C-press without the obstacles of vertical tilted mirrors .

b) Protection against walking behind the light curtain

c) Protection at the rear side of the press



Protection at the rear of the press

How to utilize and combine the light grids
All standard sizes and resolution types of the light grids of the ULCT and BLCT series (category 4) as well as those of the TLCT and ILCT (category 2) series are available as cascadable light grids and can be combined with each other. If you combine categories 2 and 4 : please refer to the safety instructions.

ULCT -Type 4 Safety light curtain
BLCT -Type 4 Safety light curtain with blanking function (blanking and reduced resolution)
TLCT -Type 2 Safety light curtain
ILCT -Type 2 Safety light curtain with blanking function (blanking and reduced resolution)

available protective fild high and resolution for all systems:

Overview table		ULCT / BLCT	ULCT
		Finger protection Resolution: 14 mm	Hand protection Resolution: 30 mm
		Range: 5 m	Range: 5 m
Protective field height (mm)	Length L (mm)	no. of beams	no. of beams
100	161	12	4
200	261	24	8
300	361	36	12
400	461	48	16
500	561	60	20
600	661	72	24
700	761	84	28
800	861	96	32
900	961	108	36
1000	1061	120	40
1100	1161	132	44
1200	1261	144	48
1300	1361	156	52
1400	1461	168	56
1500	1561	180	60

The **Master sensor** and the light grid in the middle must each be cascadable light grids. **Cascadable** light grids always require a secondary ("slave sensor") light grid, therefore the **cascadable** light grids are not to be used as stand-alone light grids.

Overview table		TLCT / ILCT	TLCT
		Finger protection Resolution: 14 mm	Hand protection Resolution: 30 mm
		Range: 5 m	Range: 5 m
Protective field height (mm)	Length L (mm)	no. of beams	no. of beams
100	161	12	4
200	261	24	8
300	361	36	12
400	461	48	16
500	561	60	20
600	661	72	24
700	761	84	28
800	861	96	32
900	961	108	36
1000	1061	120	40
1100	1161	132	44
1200	1261	144	48
1300	1361	156	52
1400	1461	168	56
1500	1561	180	60

In the cascade, the **last secondary light grid** is always a standard light grid. This can also be used as a **stand-alone light grid**.

Order codes: (examples)

1. Cascading of 2 light curtains

Safety light grid with protection height 1300 mm, 14 mm resolution — Master sensor: cat. 4
Safety light grid with protection height 400 mm, 30 mm resolution — slave sensor: cat. 4

		System	Protective height	/ number of beams
Order code:	master sensor:	ULCT-K	1300	/169
Order code:	slave sensor:	ULCT	400	/28

2. Cascading of 3 light curtains

Safety light grid with protection height 800 mm, 400 mm resolution — Master sensor: cat. 4
Safety light grid with protection height 1200 mm, 14 mm resolution — Slave sensor 1: cat. 4
Safety light grid with protection height 400 mm, 30 mm resolution — Slave sensor 2: cat. 4

		System	Protective height	/ number of beams
Order code:	master sensor:	ULCT-K	800	/3
Order code:	slave sensor 1:	ULCT-K	1200	/156
Order code:	slave sensor 2:	ULCT	400	/28

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Delivery program

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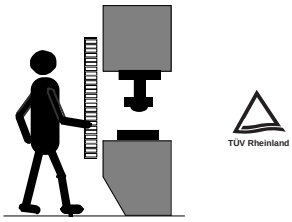
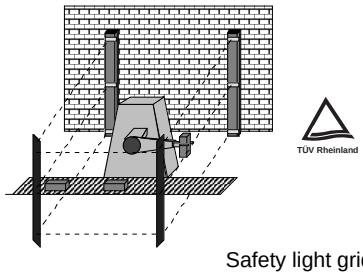
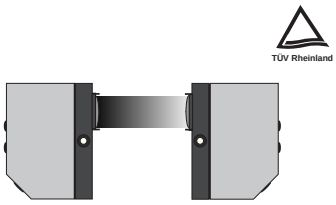
E-Mail:info@fiessler.de



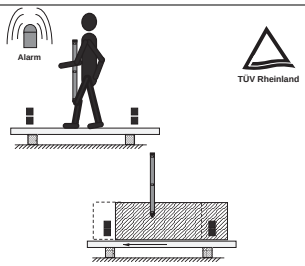
Safety light curtain



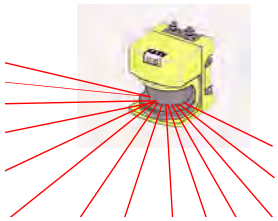
Safety light grid



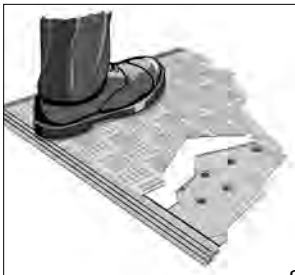
Single safety light beam



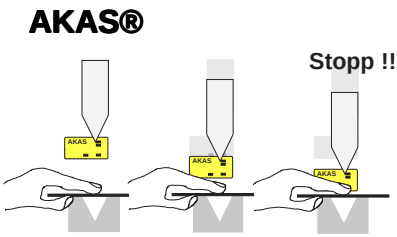
Saftey light grid with muting function



Proximity scanner

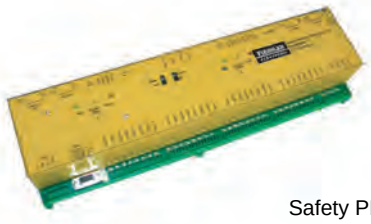


Safety mats

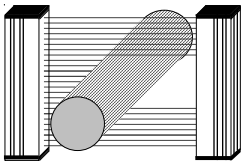


Press brake safety system

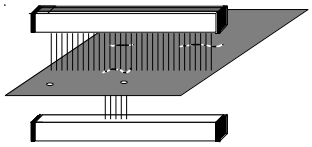
Safety foot pedal



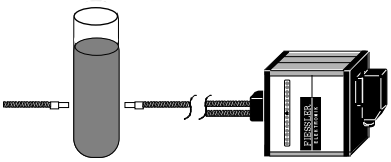
Safety PLC
Safety controllers



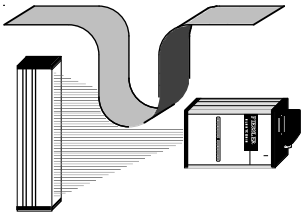
Measuring and controlling light curtains



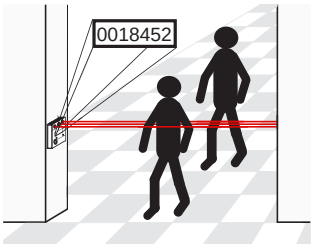
Hole detectors



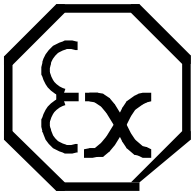
Turbidity sensors

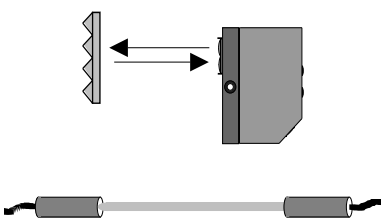


Analogue loop sensors



Counting light barriers





Light barriers for general purposes

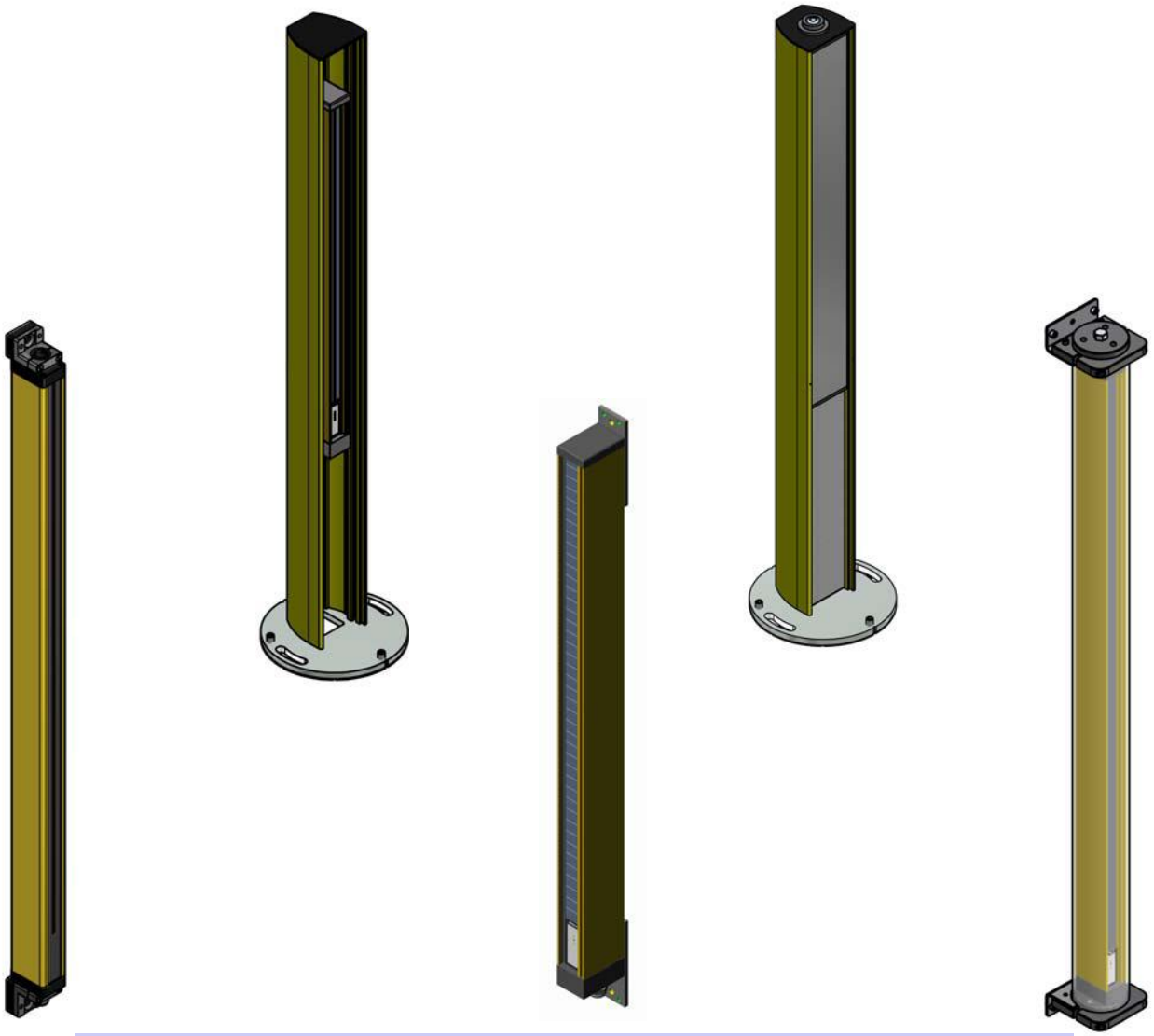
Your application

FIESSLER ELEKTRONIK

Optionally available electronic and mechanical accessories for light curtains

ULVT / TLVT and BLVT / ILVT

ULCT / TLCT and BLCT / ILCT



Accessories for light curtains of the type ULVT / TLVT - BLVT / ILVT

Accessories for light curtains of the type ULCT / TLCT - BLCT / ILCT

Safety switching unit

Assembly Columns (ram protection) for transmitter or receiver

Assembly Columns (ram protection) complete with mirror

Safe contact expander module

Configurable cables

TÜV

ZERT DIN EN ISO 9001

Typ 4 EN 61496 · PL e ISO 13849 · SIL 3 EN 61508 · Kat. 4 ISO 13849

Ex optional

c UL us LISTED

CE

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D - 73734 Esslingen
Telefon: +49 (0) 711 / 91 96 97-0 Internet: http://www.fiessler.de
Telefax: +49 (0) 711 / 91 96 97-50 eMail: info@fiessler.de

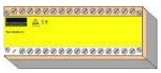
electronic accessories / switching unit

FSEM Safe contact expander module for safety related applications up to Kat.4/ SIL3/PLe ref EN 954-1/EN 62061:2005/EN ISO 13849-1: 2008
3 n.o. contact / 1n.c contact

slip-on relay output (potential-free) LSRA for type ULVT, BLVT and PLSG

slip-on relay output (potential-free) LSRA-T for type TLVT und ILVT

power supply type ULSG / ULSG/Duo K
for 1x or 2x ULVT / TLVT, ULCT / TLCT or FLSC,
for 115/230 VAC and 24 V DC, potential-free output contacts (Relais)



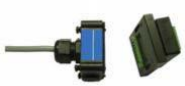
power supply type ULSG3 / ULSG 6
for 1x or 2x ULVT / TLVT, ULCT / TLCT or FLSC,
for 24V DC, potential-free output contacts (Relais)

BPSG, Blanking light curtain programmer with power supply and safety relay and potential free output contacts only for BLVT / ILVT, BLCT / ILCT

BLPG, Blanking light curtain programmer, only for BLVT / ILVT, BLCT / ILCT

Switching device PLSG 1 / 2 and Saftey control PLSG 3 to slip on the light curtain receiver of series ULVT and BLVT, further stages of development and closer information see data sheet.

Muting switching device PLSG 1K / 2K and Saftey control PLSG 3K,
for mounting in switch cabinet (top hat rail mounting)
further stages of development and closer information see data sheet.



Retrofit-Kit FGUL, Retrofit-Kit FGUL, fast exchange from FGS to ULVT
plug adapter for transmitter and receiver + mounting angle.

adjustment-laser-aid for system, ULVT/ULCT, TLVT/TLCT, LSUW, EU2K and assembly Columns. Recommended when assembling over mirrors or large ranges

---

Safe active AS-i-Safe module, device connection over M12x1 or clamps, Kat.4/PLe/SIL 3.

connecting cable for xLCT transmitter, M12, 4-pin socket, 10m length
connecting cable for xLCT receiver, M12, 8-pin socket, 10m length

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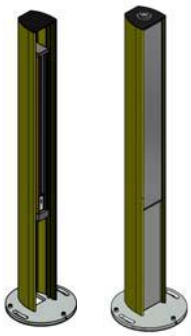
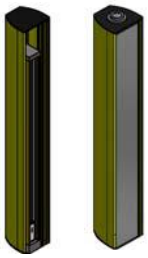
3-lead cable, price per meter**,** for XLVT transmitter
7-lead cable, price per meter**,** for XLVT receiver

mechanical accessories



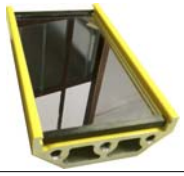
Assembly Columns (ram protection) SAU, in different heights,
for transmitter or receiver of Typ **X**LVT, incl. equalizing slab

Assembly Columns (ram protection) SASU, complete with mirror,
in different heights, incl. equalizing slab



mirror column (ram protection) SDSU, complete with mirror, in different heights,
without equalizing slab, without open space, with 2 lids as closing

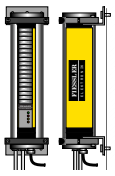
mirror column (ram protection) SDU, for transmitter or receiver,
without equalizing slab, without open space, with 2 lids as closing



deflection mirror, in different heights, (incl. Ball joints)

vibration absorber, rubber-metal, against machine-lateral vibrations,
4 absorbers per bracket

mounting angles, for the lateral assembly of the light curtains



plexiglass safety housing IP 67 for light curtains XLVT
Optionally with link for scavenging air for ex-areas: Kat. 2 and 3, zone 1, 2, 21 and 22

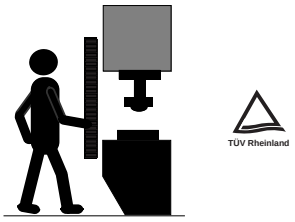
EEx-p pressurizing system. Pressure-air-switching unit for operation of light curtain
in EX-section.
ATEX certificated by ATEX 95 (100a) as well as EN 50016

Heating for safety light barriers

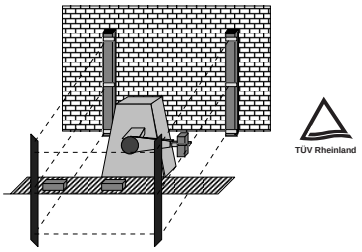
Test bars, in different sizes

Delivery program

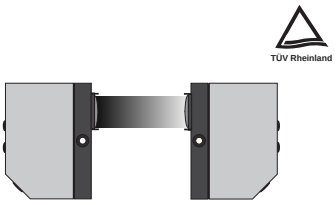
Fiessler Elektronik
Kastellstr. 9 D-73734 Esslingen
Telefon: 0711 / 91 96 97-0
Telefax: 0711 / 91 96 97-50
WWW.fiessler.de
E-Mail:info@fiessler.de



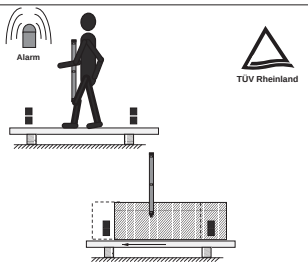
Safety light curtain



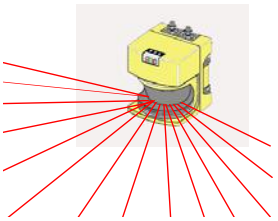
Safety light grid



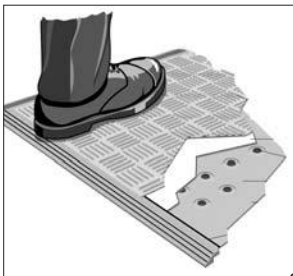
Single safety light beam



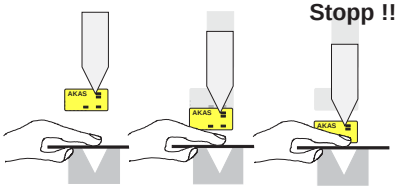
Saftey light grid with muting function



Proximity scanner



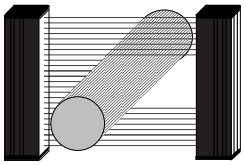
Safety mats



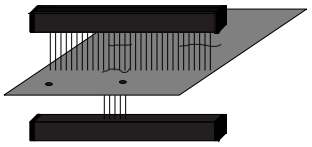
Press brake safety system

Safety foot pedal

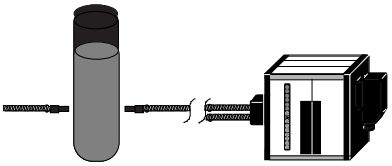
Safety PLC
Safety controllers



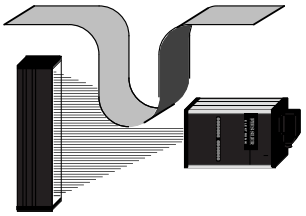
Measuring and controlling light curtains



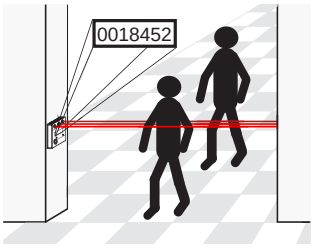
Hole detectors



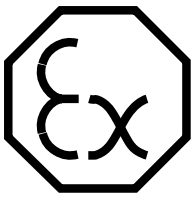
Turbidity sensors

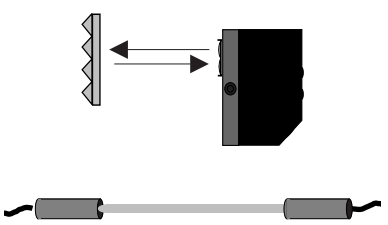


Analogue loop sensors



Counting light barriers





Light barriers for general purposes

Your application

Snap-on relay outputs LSRA

Snap-on relay outputs LSRA-T

Snap-on potential-free relay outputs

LSRA for the use of safety light curtains ULVT and BLVT

LSRA-T for the use of safety light curtains TLVT and ILVT

Easy-to-install serial connections with other safety sensors

Enables the connection to common safety bus nodes

optional

Provides the solution for cost-saving serial connections

Offers high switching performance

No more additional switching units required

DIN EN ISO 9001
Reg.Nr. 96007

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D - 73734 Esslingen
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Telefax: +49 (0) 711 / 91 96 97-50 eMail: info@fiessler.de

Application

The standard safety light barriers of the ULVT / BLVT and TLVT / ILVT series are equipped with electronical semiconductor outputs.

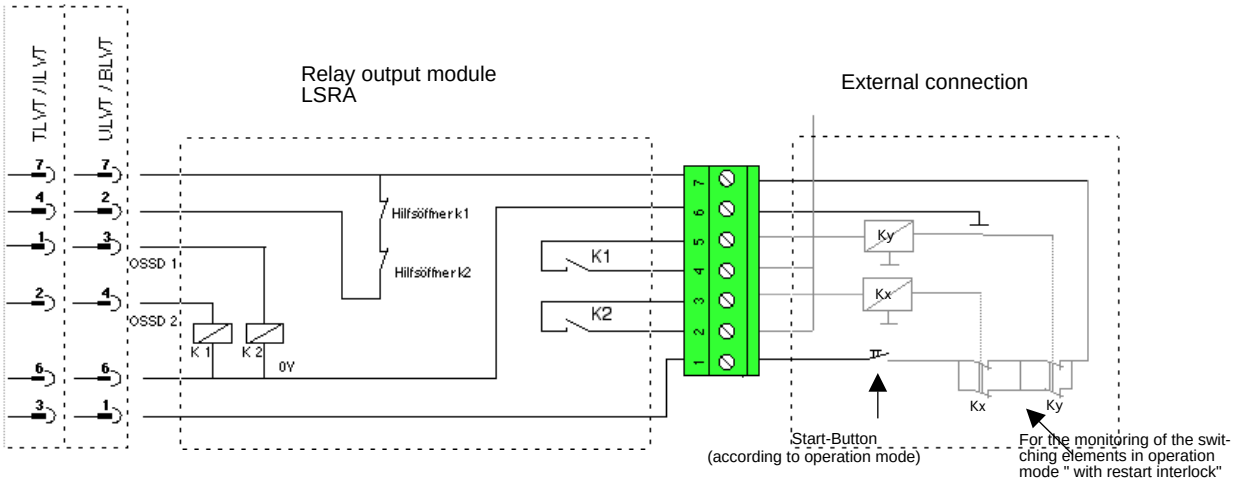
In order to directly connect the barriers to the outputs using higher currents, i.e. higher voltages, the snap-on relay output module LSRA / LSRA-T has been developed.

Both potential-free relay outputs of the LSRA / LSRA-T provide an easy-to-install serial connection of several safety light barriers or safety sensors.

By the use of the snap-on relay output module LSRA, the safety light barriers of the ULVT and BLVT series can be connected to a multitude of safety bus nodes.

By the use of the snap-on relay output module LSRA-T, the safety light barriers of the TLVT and ILVT series can be connected to a multitude of safety bus nodes.

Connection diagram

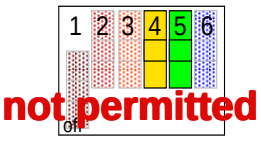
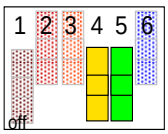


The cable layout of the cables between the terminals 2, 3, 4, 5, must be arranged in a way that there is no possibility of the conductors' short circuiting. Therefore all unprotected cables have to be installed in reinforced hoses and/or in cable channels.

Required selection of operational modes at the receiver of

ULVT / BLVT

TLVT / ILVT

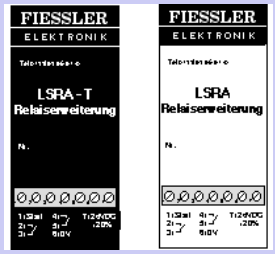
without contactor control	with contactor control	
 **not permitted**		The operation mode **with contactor control** provides the monitoring of the Relay Output Module LSRA / LSRA-T. When operating the Relay Output Module with the ULVT/ BLVT or TLVT/ ILVT , the option "Relay Output Module" must be selected at the receiver head.

Technical Data

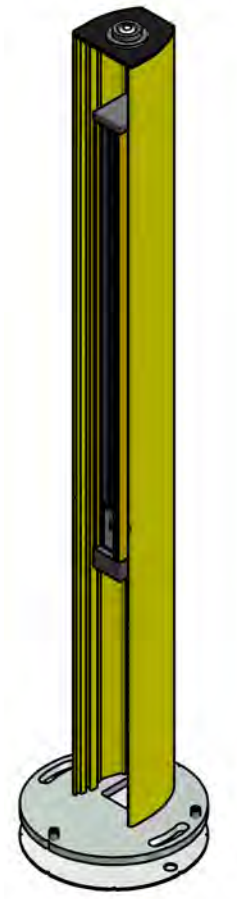
Maximum load capacity of the potential-free contacts:	5A / 50V
Dimensions in mm:	L: 116, B: 46, H: 70
Weight :	200g

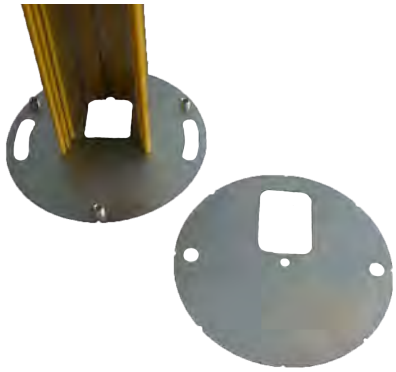
LSRA ---> use with ULVT / BLVT

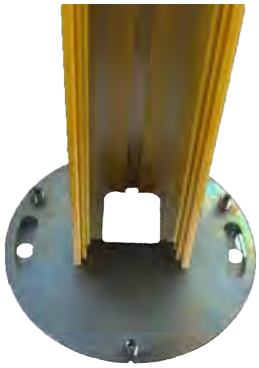
LSRA - T ---> use with TLVT / ILVT



Self Supporting Column and Shock Protector for Safety Light Barrier XLVT







TÜV

ZERT

DIN EN ISO 9001

Typ 4 EN 61496
PL e ISO 13849
SIL 3 EN 61508
Kat. 4 ISO 13849

Self Supporting Column for Safety Light Barrier XLVT

Self Supporting Column for Deflection Mirror XLVT

Built-in Shock Protector for Safety Light Barrier XLVT

Built-in Shock Protector for Deflection Mirror XLVT

optional

solid floor plate / easy assembly

with additional front window pane available

assembly even without floor plate possible

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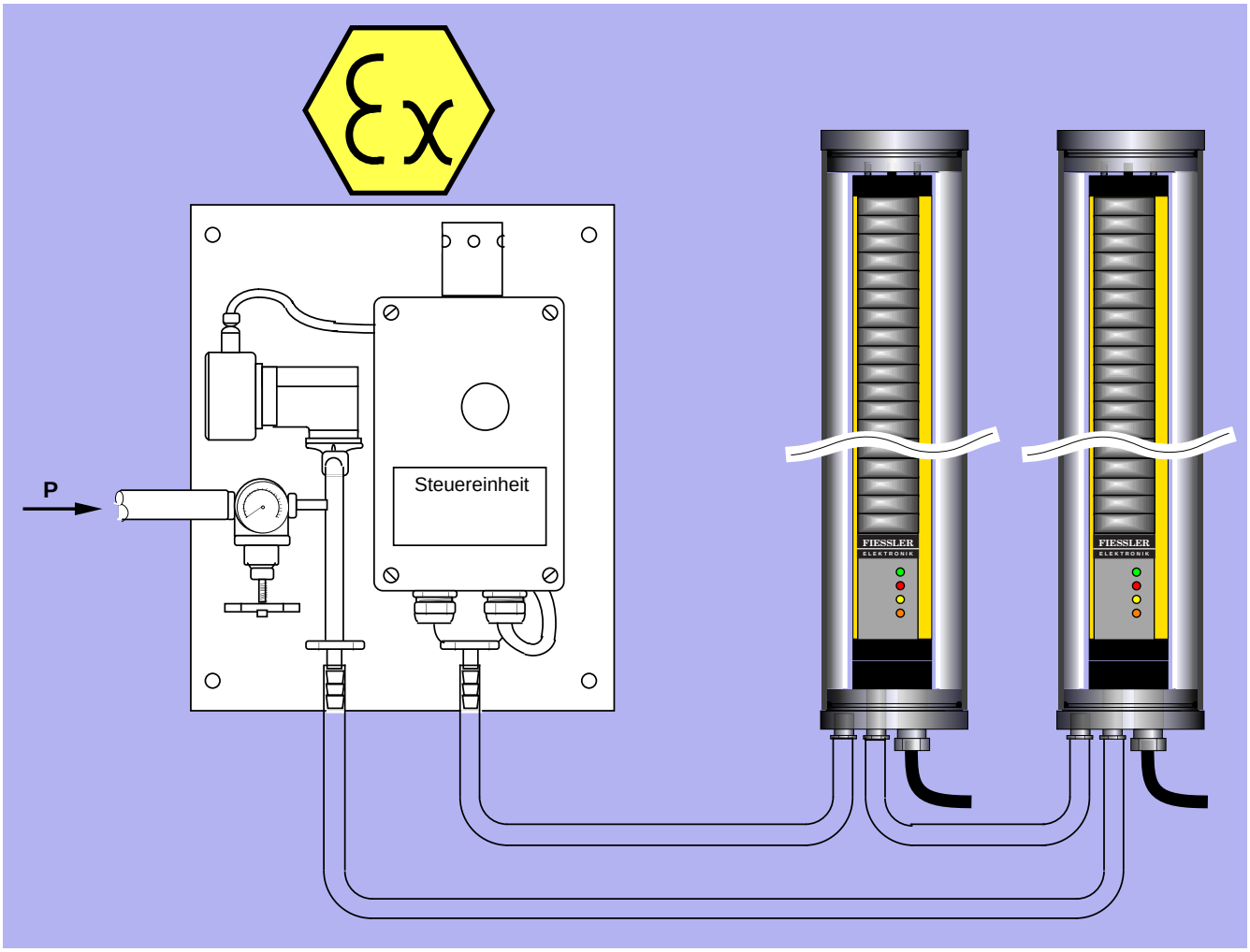
EEx-P protection for light curtains
EEx-P protection for light grids
Type xLVT and xLCT



TÜV

EEx-p for safety light curtains type xLVT and xLCT

ZERT
DIN EN ISO 9001
Reg.Nr. 96007

Use in explosive areas (dust / gas)

Typ 4 EN 61496
PL e ISO 13849
SIL 3 EN 61508
Kat. 4 ISO 13849

Ex hazardous areas of the categories 2 and 3, zone 1, 2, 21 and 22

optional

Ex-protection according ATEX 94/9 / ATEX 95

Protected enclosure

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D - 73734 Esslingen

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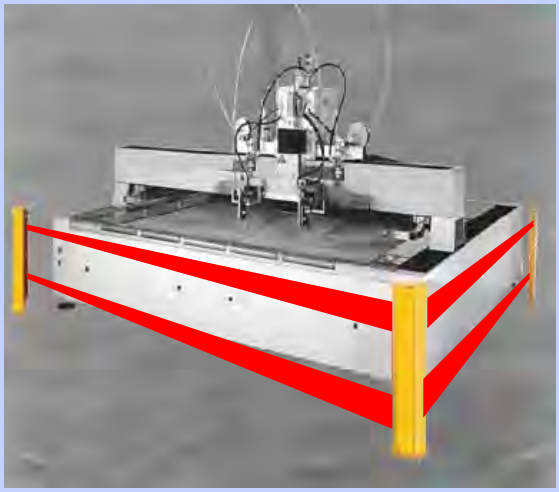
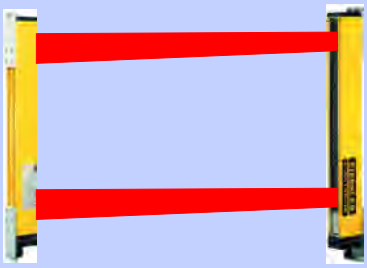
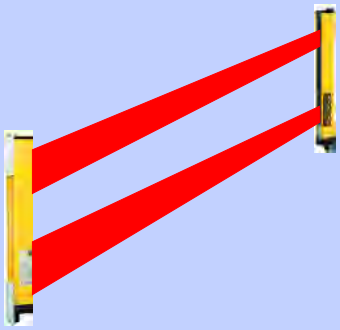
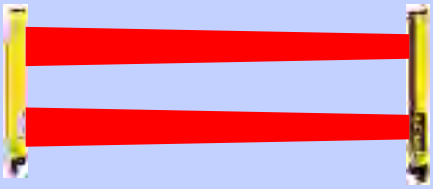
Telefax: +49 (0) 711 / 91 96 97-50 eMail: info@fiessler.de

Safety light grid for areas with **heavy dirt accumulation**









TÜV

ZERT
DIN EN ISO 9001
Reg.Nr. 96007

Safeguarding areas with heavy dirt accumulation

E.g. Saw mills, Stone saws, Waterjet cutting machines

Typ 4 EN 61496
PL e ISO 13849
SIL 3 EN 61508
Kat. 4 ISO 13849

Safeguarding outdoor areas (i.e. in case of precipitation such as snow)

optional

Switches off only if the beams are interrrupted by a person entering the area

Short response time

Detection range up to 60 m

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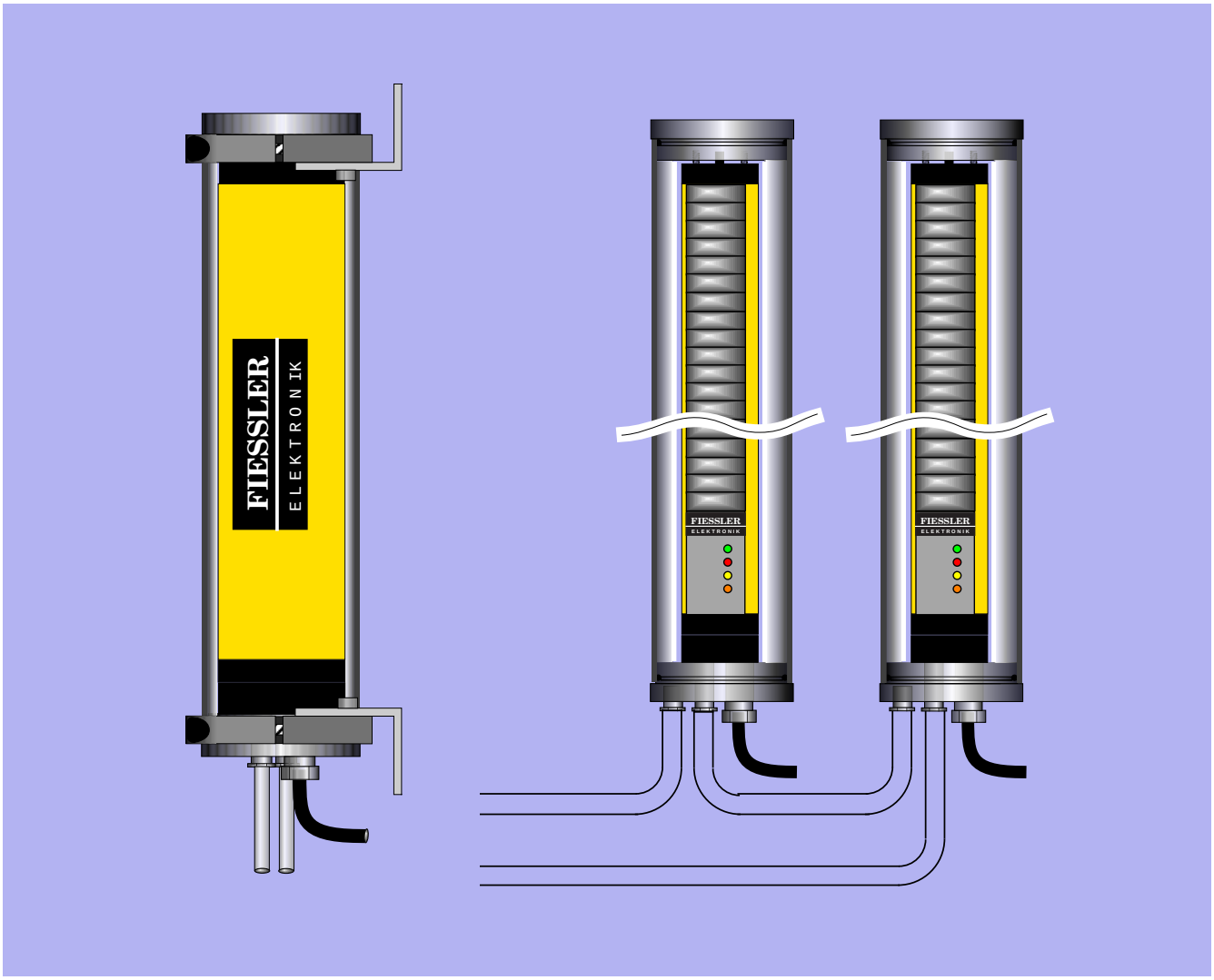
Telefax: +49 (0) 711 / 91 96 97-50 eMail: info@fiessler.de

Protective housing IP 67 for light barrier Type xLVT and xLCT



Protective housing IP 67

DIN EN ISO 9001
Reg.Nr. 96007

Increased requirements concerning tightness

Typ 4 EN 61496
PL e ISO 13849
SIL 3 EN 61508
Kat. 4 ISO 13849

Application: chemical environments

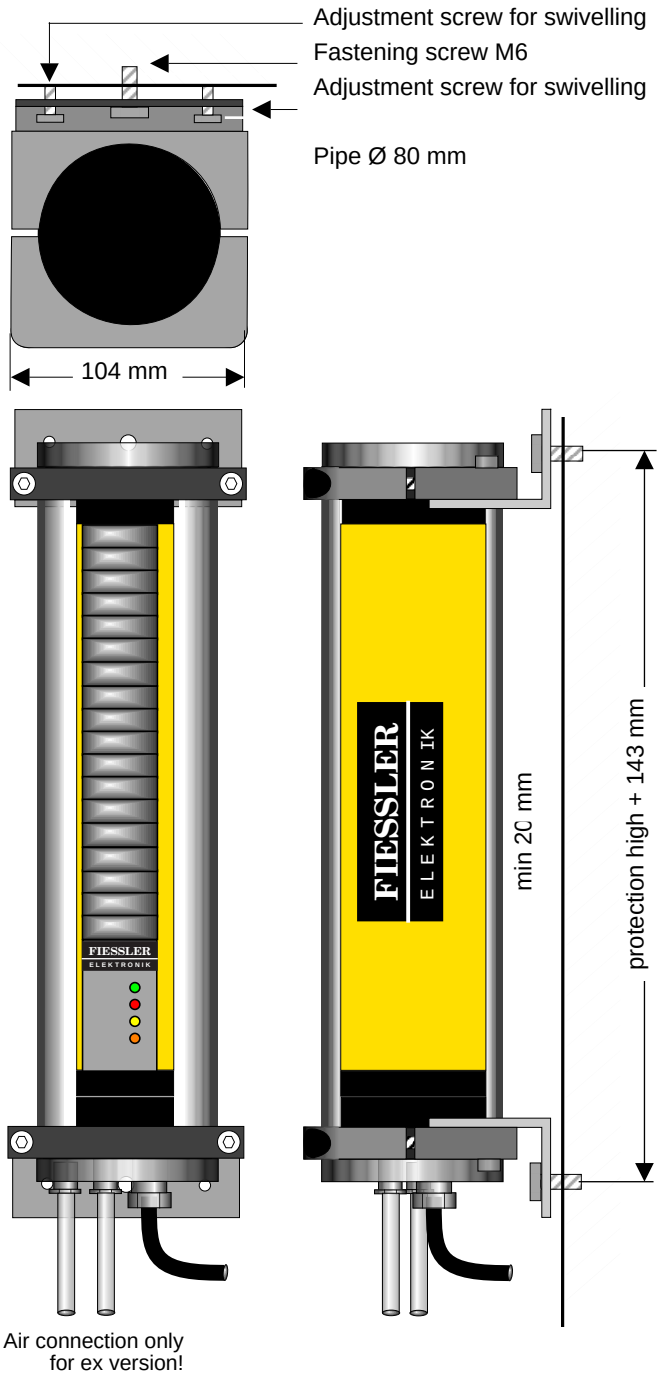
optional

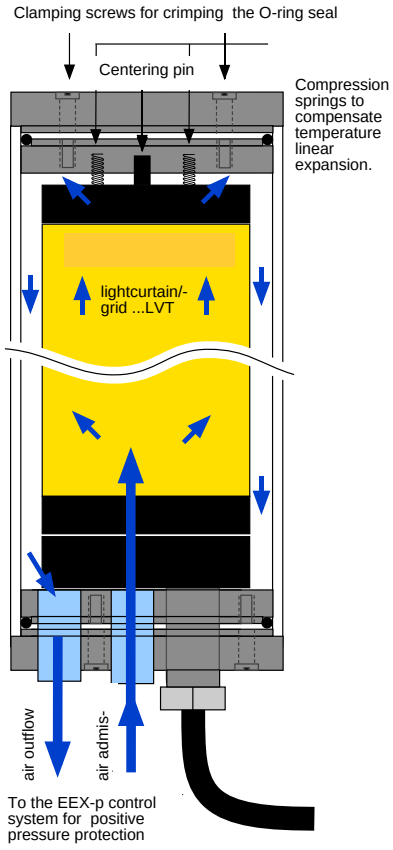
Application: food industry

Application: Ex hazardous areas

Function:
The optionally available additional housing SGH 80 has been designed for the accommodation of the components of the safety light barriers of the types ...LVT and their variants. It allows the utilisation of these light barriers even if special requirements concerning their air-tightness apply. Other applications are: - chemical or explosive environment e.g. filter press, - food industry (GMP).

Specification for EEx - p
A version with plug-in compressed air supply is available for the application in ex hazardous areas of the categories 2 and 3, zones 1, 2, 21 and 22.
In this case, an ex-free volume is created inside the protection housing by constant positive pressure of inert gas or compressed air. The positive pressure prevents the penetration of explosive gases into the equipment.





Access connecting terminals:

Remove screwed cable gland.

Loos three Allen screws.

Now the clamping cover can be removed.

Loos two Allen Screws (with O-ring seal.

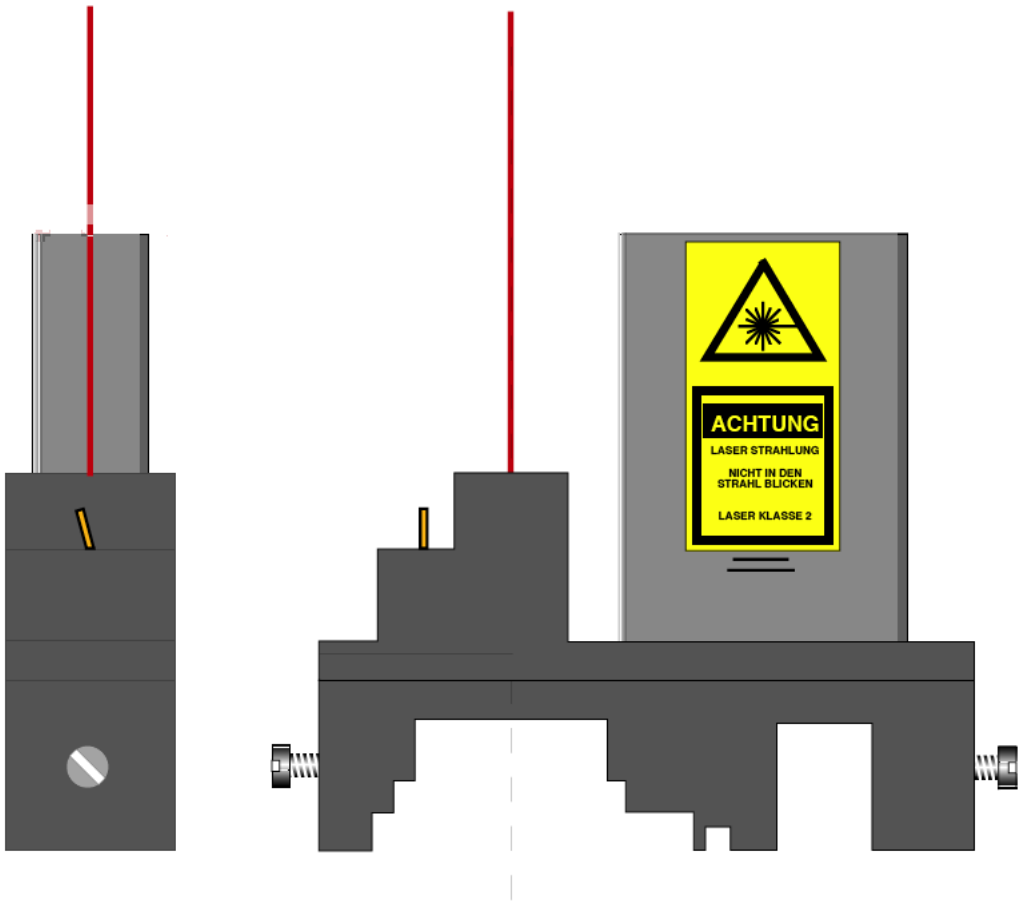
The cover with the connecting terminals becomes accessible

Connect the cables in accordance with clamp connection of the light barrier.

Before doing this, connect the screwed cable gland to the cable!

Material: Plexiglas and stainless steel

Laser Adjustment aid JHL 2



Easy alignment of light curtains and -grids

Considerably simplifies the alignment via deflection mirrors

High-precision alignment

Optimal visible laser beam for long distances as well

Adapted for all light barriers

Integrated adapter for all Fiessler light curtains

Fast mounting by elastic band

Long life by 3 AAA batteries

Easy change of batteries - comes with protective bag

DIN EN ISO 9001
Reg.Nr. 96007

Application:

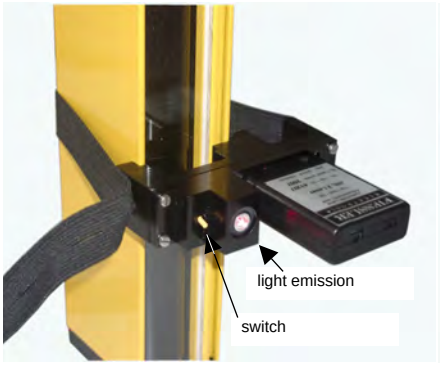
The laser adjustment aid makes the alignment of safety light curtains, -grid and barrier for long distances easy. Place the laser adjustment aid on the front window of the transmitter and receiver. The laser adjustment aid has to be evenly placed on the housing. The fixation can be carried out at the backside of the light curtain housings by the help of the rubber band. By switching on the on/off switch, the laser generates a red visible light spot which is visible even over long distances. The spot has to be aimed at the middle of the opposite housing. This test must be carried out on both ends of transmitter and receiver. If necessary, please realign/readjust the housing. Follow also the described alignment description for safety light barrier in the respective manual.

Scope of delivery:

laser module
rubber band
protective bag
Batteries 3xAAA

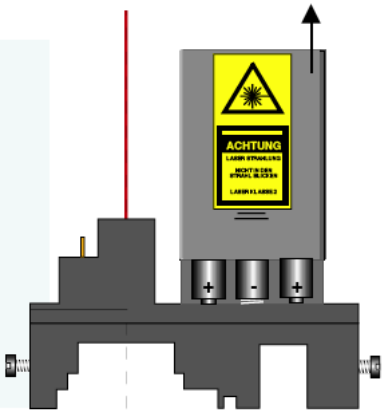
Laser class 2. Don't look directly into the laser beam!

Operation:



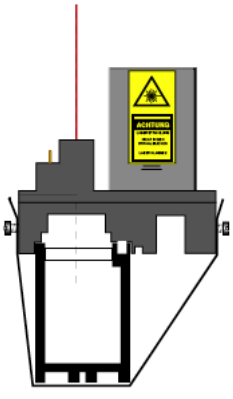
Fixation on XLVT housing

Column mounting
mount the elastic band only on one screw

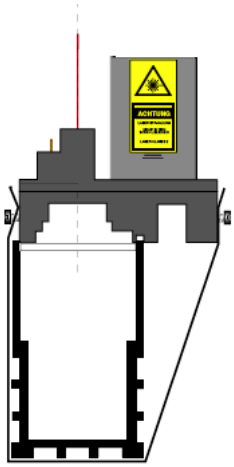


Battery change
3xAAA batteries (LR03 Micro) Alkaline

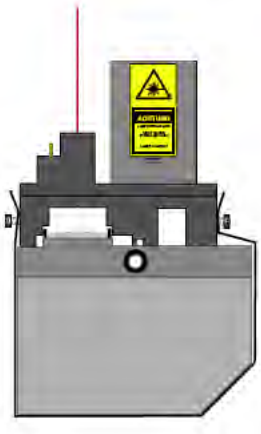
Fixation examples :

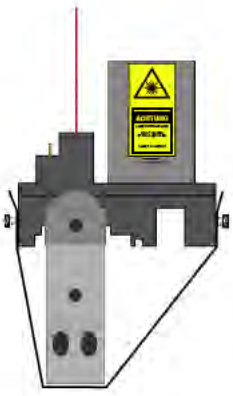


XLVT, XLCT



LSUW

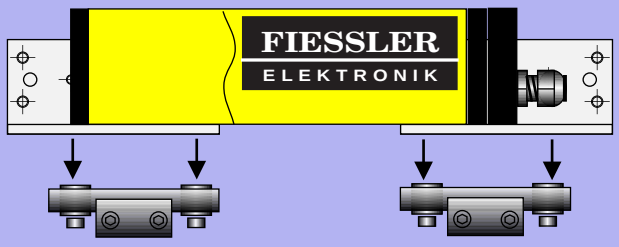




EU2K, UGC, MFL

FGUL retrofit -kit

FGS / MSL to ULVT



Fast, easy retrofitting from the FGS / MSL system to the ULVT system

No additional wiring required

No risk of connection errors

Low mounting cost

Electrical and mechanical components remain the same

Minimized machine down-times

Safety distance will remain the same (short response times)

Typ 4 EN 61496
PL e ISO 13849
SIL 3 EN 61508
Kat. 4 ISO 13849

DIN EN ISO 9001
Reg.Nr. 96007

Application

In the course of the lifetime of secured machines it may happen that the originally utilized safety light curtains of one type must be exchanged by safety light curtains of another, different type, e.g. if certain types are no longer available. Until now, this conversion was not always easy to execute due to the fact that the new safety light curtain did not possess the same connection and construction featues compatible to those of the old safety curtain. Moreover, the response times did not correspond.

Fiessler Elektronik now offers for this purpose an adapter system (FGUL), which provides the customer with a simple solution to replace a safety light curtain, e.g. a light curtain of the FGS or MSL series, by a safety light curtain of the ULVT series. The former problem of elaborating a completely new wiring is now obsolete, as the existing connection lid, the cabling and the external switch-gears can be utilized exactly as they are. In addition, the cost for mechanical components of the FGUL was reduced as far as possible by using mounting brackets at the ULVT light curtain that can be installed exactly on top of the already existing mounting brackets of the FGS / MSL type.

All electrical and mechanical components remain the same. Only the transmitter and receiver unit are exchanged. Thanks to the pre-fabricated adapter of Fiessler Elektronik, only the mounting brackets need to be screwed onto the existing mechanical FGS / MSL attachment, and the components can be connected again.By this, the risk of eventual connection errors is reliably excluded.

The use of this adaptor will reduce the installation times and considerably minimizes machine down-times.

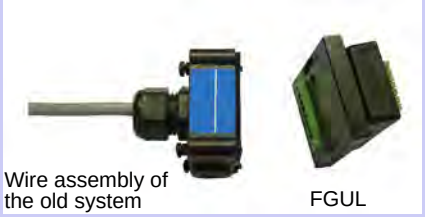
Thanks to equal or better response times of the type ULVT, there is no need to elaborate a new risk assessment and the safety distance of the installation remains the same.

The utilisation of the FGUL is also possible if the FGS is combined to LCU-X.
In this case, the further utilisation of the LCU-X is possible in combination with the ULVT system.*

Procedure

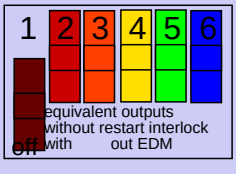
System before exchange

Disconnect and remove the wire assembly from the old light curtain



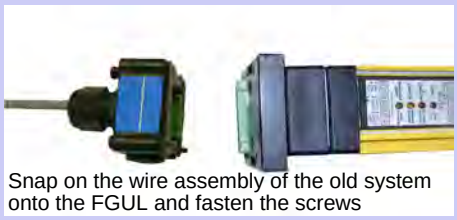
Wire assembly of the old system

FGUL



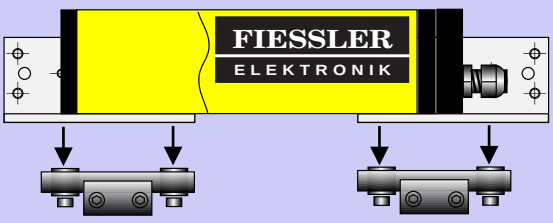
Set the dip-switches in the ULVT receiver head as shown above

Fasten the screws of the FGUL onto the ULVT system



Snap on the wire assembly of the old system onto the FGUL and fasten the screws

Now the ULVT system is ready to use.



Mounting brackets of the FGUL set with pre-fabricated connectors that fit exactly onto the already existing brackets of the FGS / MSL.

*This is, however, not applicable in the combination of FGS to the LCU-P.

Fiessler Safe Expander Module

FSEM

Safe contact expander module

For safety related applications up to cat. 4, PL e, SIL 3

in connection with ULVT, BLVT, ULCT, BLCT and FPSC

3 positive-guided undelayed safety contacts

Simple top hat rail mounting

LED indicator for both channel status

Activation optionally with one or two channels

Typ 4 EN 61496 · PL e ISO 13849 · SIL 3 EN 61508 · Kat. 4 ISO 13849

ZERT DIN EN ISO 9001 Reg.Nr. 96007

CE

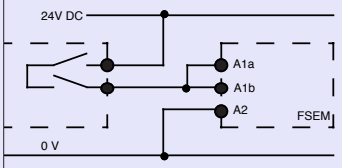
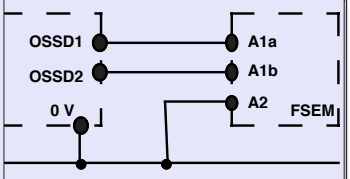
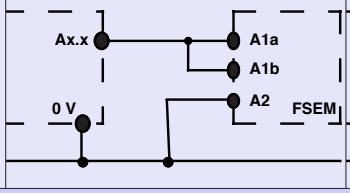
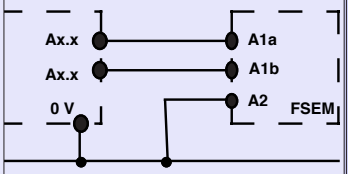
Fiessler Elektronik Kastellstr. 9
D - 73734 Esslingen

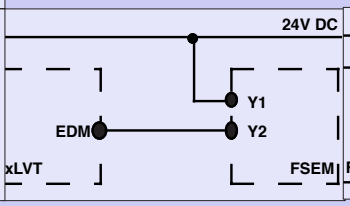
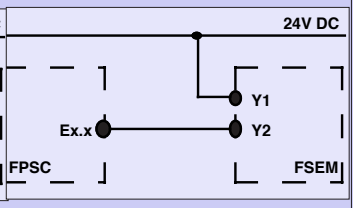
Telefon: +49 (0) 711 / 91 96 97-0 Internet: http://www.fiessler.de
Telefax: +49 (0) 711 / 91 96 97-50 eMail: info@fiessler.de

Application

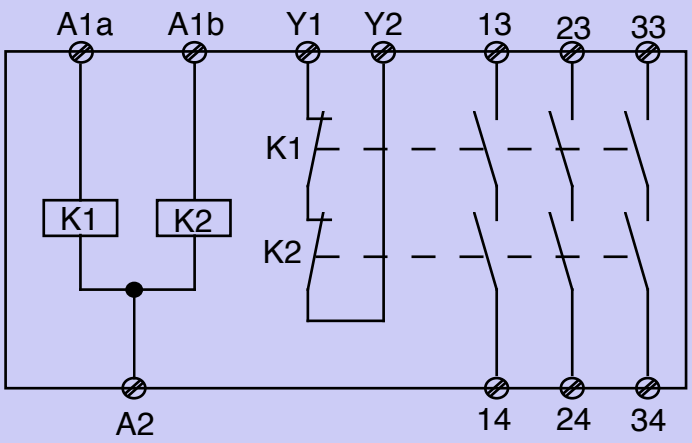
The safe expander module FSEM expands an existing circuit. As the output relays are monitored with the base unit feedback loop, it is possible to reach the same safety level to the contact expander module. Base units can be all safety devices with a monitored feedback loop. Fiessler Elektronik offers the safety light curtains series ULVT, BLVT, ULCT, BLCT as well as the programmable safety controller FPSC. It is possible to realise applications up to cat. 4, PL e, SIL 3. The achievable category is depending on the base unit and the electrical connection.

Operating modes

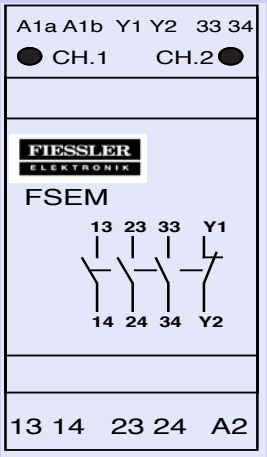
Input circuit	Single channel	Dual channel
Base unit: Safety relay		
Base unit: Safety light curtains series ULVT, BLVT, ULCT and BLCT		
Base unit: Programmable safety controller FPSC		

Feedback loop		
EDM and Ex.x are inputs on the base unit. They are evaluating the feedback loop signal. In case of FPSC we recommend using the Software block valve monitoring.		

Block diagram



Terminal configuration



Technical details

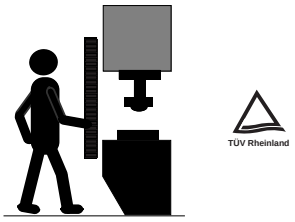
Electrical data:	
Supply voltage UB DC	24V
Voltage tolerance	19,2 ... 30V DC
Residual ripple DC	max. 10%
Output contacts in accordance with EN 954-1	Safety contacts: 3
Output breaking capacity at 240V AC	
13 14, 23 24	Imin:0,01A, Imax: 6A ohmisch
Output breaking capacity at 160V AC	
33 34	Imin:0,01A, Imax: 6A ohmisch
Output breaking capacity at 24V DC	
13 14, 23 24, 33 34	Imin:0,01A, Imax: 6A
Fuse for supply voltage (external)	T1,0A/250V
Fuse for circuit breaker	6A slow
Times:	
Switch-on delay	≤ 20 ms
Fall-delay time	≤ 15 ms
General data:	
Contact material	AgC2O
Airgap creepage	DIN VDE 0110-1
connection/wiring	pluggable screw terminals min. 0,5qmm, max. 2,5 qmm.
Dimensions (without connectors)	H: 85,5 mm W: 35 mm D: 58 mm
Installation	Top hat rail mounting (DIN rail 35mm)
Weight (without connectors)	110 g
Ambient temperature	0° C ... 60°C
Switching Cycle life time	>50 x 106

Order reference

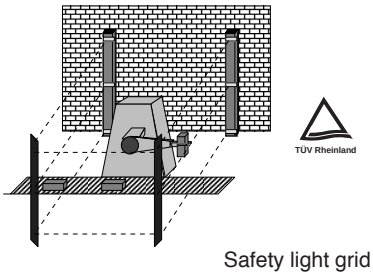
FSEM-C3-S	**with screw terminals**
FSEM-C3-F	with cage clamp terminals

Delivery program

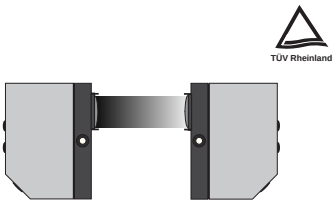
Fiessler Elektronik
Kastellstr. 9 D-73734 Esslingen
Telefon: 0711 / 91 96 97-0
Telefax: 0711 / 91 96 97-50
WWW.fiessler.de
E-Mail:info@fiessler.de



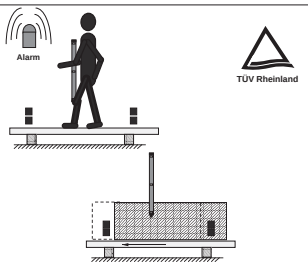
Safety light curtain



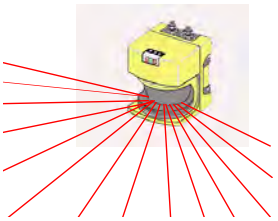
Safety light grid



Single safety light beam

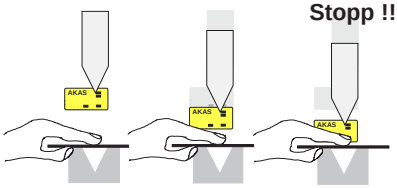


Saftey light grid with muting function



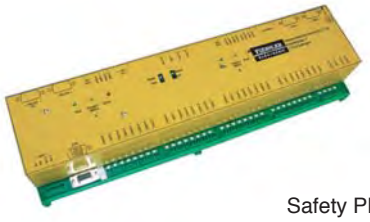
Proximity scanner

Safety mats

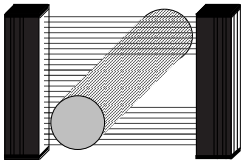


Press brake safety system

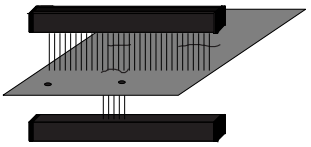
Safety foot pedal



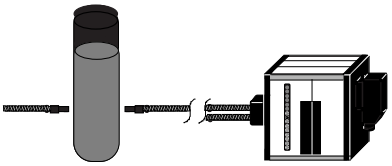
Safety PLC
Safety controllers



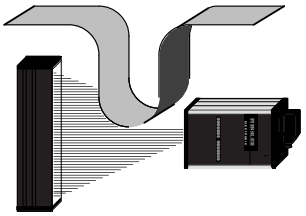
Measuring and controlling light curtains



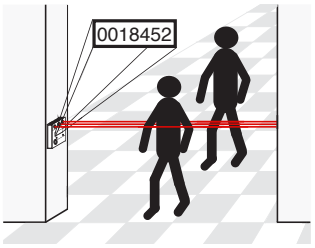
Hole detectors



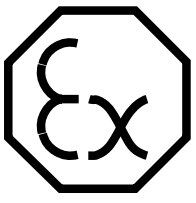
Turbidity sensors

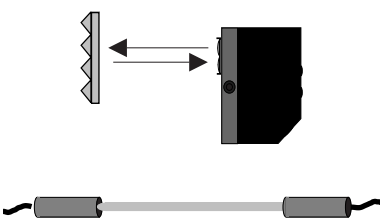


Analogue loop sensors



Counting light barriers





Light barriers for general purposes

Your application

AS-i-Safe connection module for Fiessler Elektronik products

FAC 007S

Connection for AS-i-Safe Bus for standard safety systems

Simple and well-arranged cable layout

Easy storage

Flexible system - easily expandable

Simple addressing

Use of standard safety components

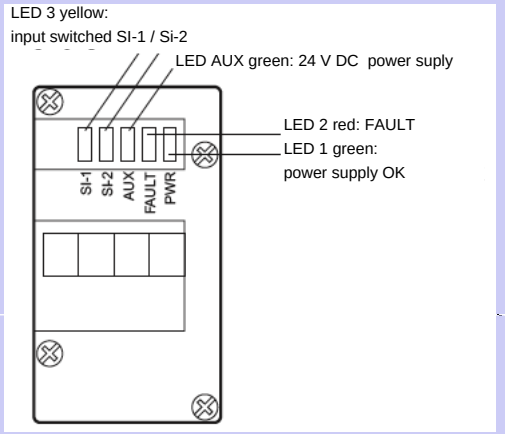
DIN EN ISO 9001
Reg.Nr. 96007

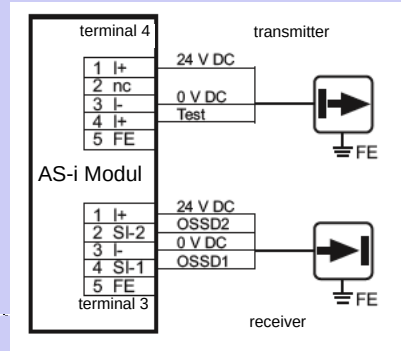
Typ 4 EN 61496
PL e ISO 13849
SIL 3 EN 61508
Kat. 4 ISO 13849

Application

The AS-i Safe connection module is used to connect safety sensors such as safety light curtains, safety light grids, safety area scanner to an AS-i Safe Bus system. An 8 x 4 Bit code table will be transmitted by the AS-i system . The code table will be evaluated by the AS-i safe monitor. The safety sensors can be connected directly by M12 plugs or by use of standard cable on the AS-i Safe connection module.

Connection





terminal 4

terminal 3 (receiver)

M12 terminal	Pin
power supply +24V	1
OSSD2	2
power supply 0V	3
OSSD1	4
FE	5

terminal 3

terminal 3 (transmitter)

M12 terminal	Pin
power supply +24V	1
not used	2
power supply 0V	3
power supply 24V test	4
FE	5

terminal 4

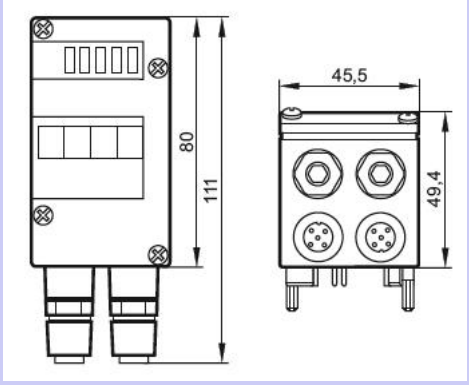
AS-i Module

area scanner

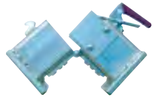
terminal 3

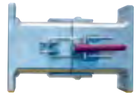
Technical data

Electrical data	2 safe inputs (OSSD)
upply voltage UB DC	26,5...31,6 V DC
Load current:	≤ 35 mA
Inputs	DC PNP
Sensor supply	ext. 24 V DC PELV ± 15%
Load current:	≤ 2 A
Short circuit proofed	ja
Level High/Low-signal 1 (IEC 61131-2 Typ 2):	> 11 V / < 5 V
Imput current High/Low (IEC 61131-2 Typ 2):	> 6 / < 2 mA
Display:	
Power LED:	green
Error LED:	red
Function LED:	Yellow
Ambient temerature [°C]:	-25...55
Protection class:	IP 67

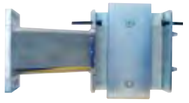


Additional Equipment for AKAS® and AKAS®II





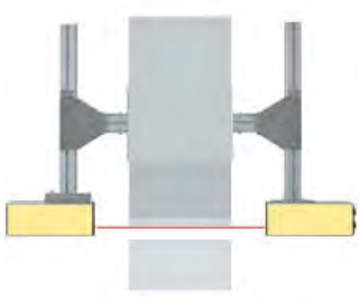
Adaptor for swivable holder

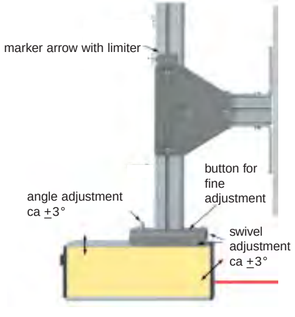


U-Holder for lateral mounting

Adjustment screws provide easy adjusting

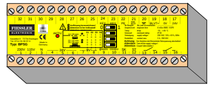
Additional equipment for AKAS®LC





Patented holders for AKAS®LC. High repeating accuracy and integrated fine adjustment. Self locking height adjustment. Marker arrows for using different tools. No squeezing risk in case of unwanted closing movements

Additional equipment for BLVT



BPSG Blanking light curtain programmer with power supply and forcible guided normally-open contacts, with potential-free outputs

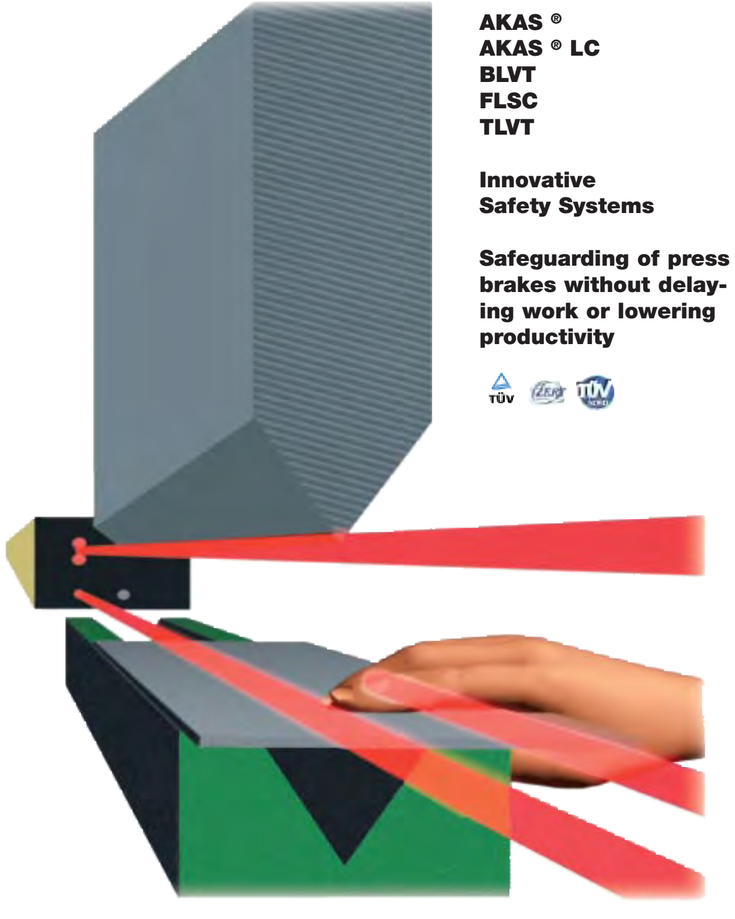
BPLG Programmer with power supply

UMLW Muting lamp as indication of the muted state of the safety light curtain.

Service: Either Fiessler Elektronik or their authorized integrator-distributor partners abroad will be pleased to offer you the installation of the safety equipment for press brakes.

FIESSLER ELEKTRONIK

Press Brakes Protection



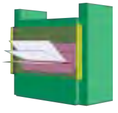
AKAS ®
AKAS ® LC
BLVT
FLSC
TLVT

Innovative Safety Systems

Safeguarding of press brakes without delaying work or lowering productivity

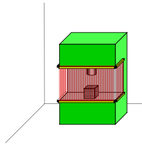
Product Program

Safety Light Curtains

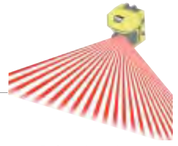


Blanking

Pressure Sensitive Safety Footmats



Cascadable Light Curtains



Safety Area Laser Scanner

Fiessler Elektronik OHG **Kastellstr. 9** **DE-73734 Esslingen**

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Representations abroad:

Fiessler Elektronik has representations in all major industrial nations. Please inquire with us for your country.

Our homepage **www.fiessler.de** provides you with the most recent company news, data sheets and operating instructions of our products.

Award of Appreciation bestowed on our company for having developed the AKAS® system

In the year 1957, Dipl.-Ing. H.W. Fiessler founded the company Fiessler Elekjtronik in esslingen, Germany, with the aim to produce optical-electronic appliances.
In the management policy, the solution of the very specific problems of their customers was given priority right from the start of the business.

More than 40 years ago, the development and the construction of accident-preventing safety light curtains was started. Since this day, the Fiessler infra-red accident-preventing safety light barriers are being used most successfully in industrial operation.

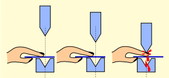
The company Fiessler Elektronik is managed now by the second generation. A team of 40 highly qualified emplyees as well as a rather broad scale of products are the basis for innovative outputs in the field of safety technology and customer-specific optosensorics.

A quality control system according to ISO 9001 guarantees a constant high level quality of both products and services.

Doku Nr. 771 Stand 28.11.05/SO/englisch

AKAS®

Task:

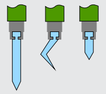


Bending of sheet metal of small or medium handling geometry:

flat-iron sections

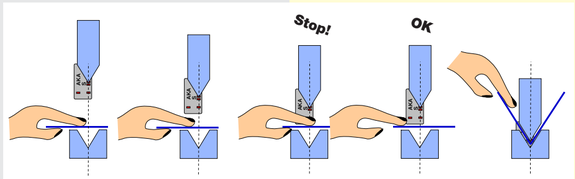
box-shaped parts

using tools of different tool hights



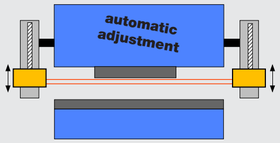
Solution:

The following optical safety light grid **AKAS®** is located right at the bending level and prevents the trapping of a part of the body between the moving and the fixed tools.
Transmitter and receiver are fixed to the ram of the machine and form a LASER-optical safety light grid that follows the ram. Therefore, the hands remain free for handling the slug during operation under continuous protection of the extremities during the whole bending process.
This will not interfere with the operating rhythm.

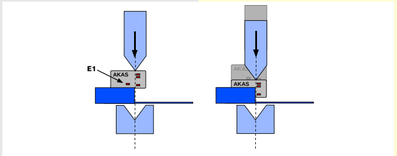


Function:

The safety laser beams are located beneath the tool. Box-shaped parts and smallest workpieces can be hand-held during the bending process.

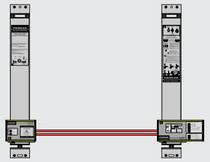


tool change-over
The motor-driven transmitter and receiver are each mounted on supports. Their current position is detected by an optical synchronization, therefore providing a quickautomated adjustment after each tool change-over.



The case-bending function provides bending of box-shaped items without stopping the bending procedure.

Picture:



Order code:

Ak/150/SE AKAS®, constisting of transmitter, receiver and supports. Positioning range of supports: 150 mm (Supports with larger positioning ranges are available on request)

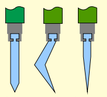
AKAS® LC

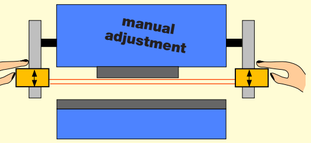
Bending of sheet metal of small or medium handling geometry:

flat-iron sections

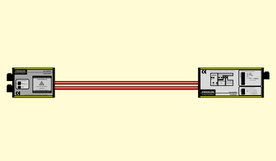
box-shaped parts

using tools of equal tool hights





tool change over
System for using tools of equal tool heights.



Ak/SE AKAS®-LC, consisting of transmitter and receiver.

Light Curtain & Foot Pedal

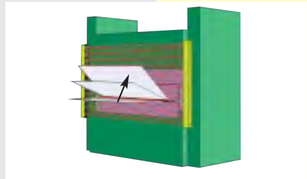
Bending of sheet metal of small or medium handling geometry:

flat-iron sectios

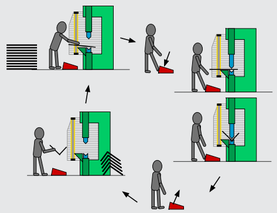
no box-shaped parts

medium-sized lots

The **BLVT** light curtain prevents the trapping of a part of the body between the tool and the inserted sheet metal and/or the matrix.
The transmitter and the receiver fo the safety light curtain BLVT generate a protecting field that is located at least 10mm in front of the bending level. 11 different easy-to-program blanking functions allow the use of flat sheet metal workpieces moving within the protective field without causing any unwanted machine stop.

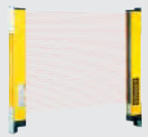


Workpiece is blanked



BLVT with foot pedal.
Machine operator starts the bending process by activating a foot pedal.

This solution does not provide the possibility to hold small workpieces by hand during the closing movement of the press. Box-shaped parts that reach into the bending area during the closing movement of the machine, will stop the closing movement of the press brake.



B800/104, Safety light curtain BLVT class 4 with Blanking features. Min. resolution 14mm.

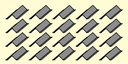
Light curtain + Cycle control

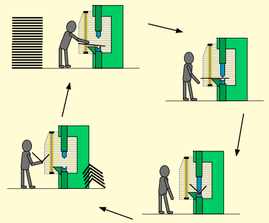
Bending of workpieces of small or medium handling geometry:

flat-iron sections

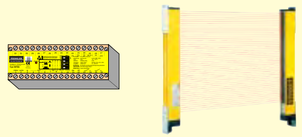
no box-shaped parts

large lots





BLVT with cycle mode.
Automated operation combined with the programable miniature safety controller LSUW NSR3-1K. During 2-cycle mode, this guarantees a high productivity level when bending flat workpieces.

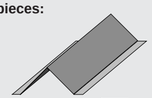


B800/104, Safety-light curtain class 4 with Blanking features. Minimum resolution 14mm.
NSR3-1K, programmable Safety controller module LSUW NSR3-1 K

Area Laser Scanner

Bending of large Workpieces:

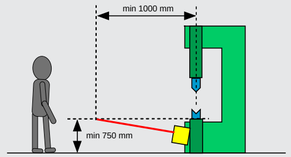
large flat-iron sections



large box-shaped parts

medium-sized lots

During the bending of large parts, a safety area laser scanner provides a sufficient safety standard. Distance between operator and bending level must be a least 1000 mm.

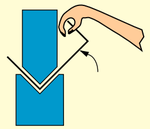


Protection by distance regulation

FLSC Safety Area Laser Scanner

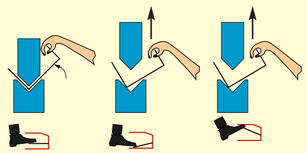
Safety Foot Pedal

Prevention and/or reduction of possible accidents when sheet metal moves upwards towards the ram during the bending process:



If hands or fingers are trapped between the upwards moving sheet metal edge and the ram, the machine operator is able to react accordingly by releasing or pressing down the pedal.

The pedal has a hard point (**Pos. 1**). By pressing down the pedal until this hard point, the dangerous movement of the press is started.
If the pedal is pressed down beyond this hard point, (**Pos.2** or **Pos 3**), the contact block for the dangerous moment is released, and a safety contact block (1 positively driven NC contact + 1 NO) is opened.



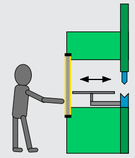
Pos 1 **Pos 2** **Pos 3**

The return into its original position is carried out automatically by releasing the pedal.
Two separate safety contac blocks (mechanical and electronical) working independently from each other, the redundance of the system is provided.
Apart from its safety features, the twin safety foot pedal provides a standard pedal for several non-safety related features.

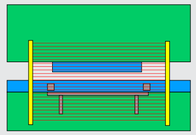
FL1-528/ZSD4
Single safety foot pedal
FL1-528/ZSD4-U
Twin safety foot pedal

Light Curtain Class 2

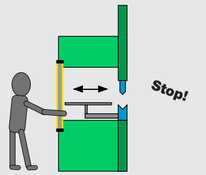
Safeguarding of the interior of the press brake from the rear end of the press:



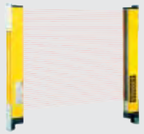
The transmitter and receiver of the safety light curtain TLVT generate a protective field that safeguards the back of a pressbrake.



Safeguarding of a press brake at its back opening



If the operator reaches through the protective field into the opening, the rear drive shafts will come to an immediate stop.



T1200/84 Safety light curtain TLVT safety class 2, Min. resolution 14mm.