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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

Technische und Inhaltliche Änderungen vorbehalten
Doku Nr. 1142 / EW

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

FIESSLER
ELEKTRONIK

Our experience for your safety

our vision

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 Solutions FIESSLER ELEKTRONIK

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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2002/10/25 3:30pm

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Fiessler Elektronik - world wide

Sales agencies in more than 20 countries

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Fiessler Elektronik - sales organisation

Sales agencies - Germany

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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**
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Compact Safety light curtains ULCT/ BLCT
2-beam safety light EU2K 500/2 BWS-Typ 4
Single beam light barrier EU2K

Typ 2 Safety-light barrier / curtain
Safety light curtains TLVT
Compact Safety light curtains TLCT/ ILCT

Typ 4 Safety controller
Snap-On safety controller for the light curtain / light grid PLSG
Compact safety controller PLSG K
Programmable Safety Centre FPSC

Press brake safety
Press brake safety system AKAS®

Documentation on the attached CD

Other operating instructions are available on request
or can be downloaded on the Internet at

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- Application training
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- Safety controller
- Press brake safety
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Controlling, detecting and measuring, conveyor technique

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-Controlling, detecting and measuring, conveyor technique

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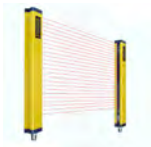
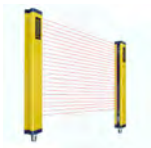
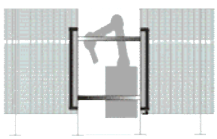
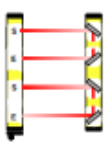
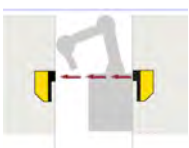
	ULVT	Safety-light curtain ULVT cat. 4, finger-, hand- and body- protection, detection ranges up to 60m, protection heights 100mm -1900mm, model 40X60mm Safety category 4, PL e, Sil 3	**C** C 1
	BLVT	Safety-light curtain BLVT, blanking, cat. 4, finger-, hand- and body- protection, detection ranges up to 60m, protection heights 100mm -1900mm, model 40X60mm Safety category 4, PL e, Sil 3	**C** C 1
	**ULCT**	Compact safety-light curtain ULCT cat. 4, finger-, hand- protection, detection ranges up to 5m, protection heights 100mm -1500mm, model 25X35mm Safety category 4, PLe. Sil 3	**C** C 2
	**BLCT**	Compact safety-light curtain BLCT, blanking, cat. 4, finger-, hand- protection, detection range uo to 5m, protection heights 100mm -1500mm, model 25X35mm Safety category 4, PL e, Sil 3	**C** C 2
	ULVT-grid	Safety-light grid ULVT cat. 4, body- protection, detection ranges up to 60m, protection heights 100mm -1900mm, model 40X60mm Safety category 4, PL e, Sil 3	**C** C 3
	BLVT-grid	Safety-light grid BLVT, blanking, cat. 4, body- protection, detection ranges uo to 60m, protection heights 100mm -1900mm, model 40X60mm Safety category 4, PL3. Sil 3	**C** C 3
	**ULVT500/2R**	Safety-light grid ULVT, 500/2R cat. 4, body- protection, detection range 8m, Transmitter/receiver unit, mirror unit, protection height 500mm, model 40X60mm Safety category 4, PL e, Sil 3	**C** C 3
	**YPZX 564438V**	Safety-light grid ULVT 1200/4R cat. 4, body- protection, detection range 10m, Transmitter/receiver unit, mirror unit, protection height 1200mm, model 40X90mm Safety category 4, PL e, Sil 3	**C** C 4
	**EU2K**	Single beam safety light barrier EU2K, cat. 4 with cable or M12 plug, detection range 30m, optional 100m	**C** C 5
	TLVT	Safety-light curtain TLVT cat. 2, finger-, hand- and body- protection, detection ranges up to 60m, protection heights 100mm -1900mm, model 40X60mm Safety category 2, PL C, Sil 1	**D** D 1
	ILVT	Safety-light curtain ILVT, blanking, cat. 2, finger-, hand- and body- protection, detection ranges up to 60m, protection heights 100mm -1900mm, model 40X60mm Safety category 2, PL C, Sil 1	**D** D 1

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Product overview

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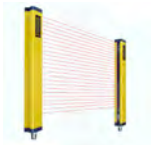
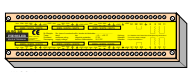
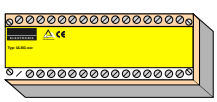
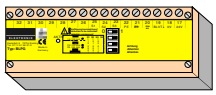
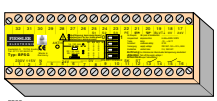
	TLCT	Compact safety-light curtain TLCT cat. 2, finger-, hand- protection, detection range up to 5m, protection heights 100mm -1500mm, model 25X35mm Safety category 2, PL C, Sil 1	**D** D 2
	**ILCT**	Compact safety-light curtain ILCT, blanking, cat. 2, finger-, hand- protection, detection range up to 5m, protection heights 100mm -1500mm, model 25X35mm Safety category 2, PL C, Sil 1	**D** D 2
	Cascade	Safety-light curtain ULVT, BLVT, TLVT, ILVT - cascadable Compact safety-light curtain ULVT, BLVT, TLVT, ILVT - cascadable	**E**
	LSRA	Snap-On relay output module LSRA for types ULVT, BLVT and PLSG	**F** F 1
	LSRA-T	Snap-On relay output module LSRA-T for types TLVT and ILVT	**F** F1
	Column	Mounting column with shock protector for transmitter and receiver, heights 100mm- 2100mm. Mounting column with shock protector for diversion mirrors, heights 100mm- 2100mm	**F** F 2
	ULSG	Power supply type ULSG for safety light curtains, power supply 115/230V AC & 24 V DC, potential free relay outputs Safety category 4, PL e, Sil 3	**F** F 3
		Power supply type ULSG for 3-6 safety light curtains, power supply 115/230V AC & 24 V DC, potential free relay outputs Safety category 4, PL e, Sil 3	**F** F 3
		Power supply type ULSG/Duo for 2 safety light curtains, power supply 115/230V AC & 24 V DC, potential free relay outputs Safety category 4, PL e, Sil 3	**F** F 3
	**BLPG**	BLPG, Blanking programming unit for safety light barrier Safety category 4, PL e, Sil 3	**F** F 4
	**BPSG**	BPSG, Blanking programming unit with power supply for safety light barrier with potential free relay outputs Safety category 4, PL e, Sil 3	**F** F 4

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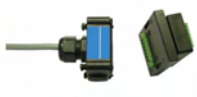
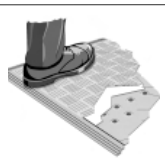
	EEx-p / ATEX	Safety-light barrier for ex hazardous areas (EEx-p)	**F** F 5
	SGH-80	Protective housing IP 67 for light curtains. Optional with plug-in compressed air supply for ex hazardous areas cat. 2 and 3, zone 1, 2, 21 and 22	**F** F 6
	Adjustment laser	Adjustment-laser aid for all safety light barrier and column	**F** F 7
	**FGUL**	Retrofit -Kit FGUL, fast and easy retrofitting from FGS/MSL system to ULVT with mounting brackets for transmitter and receiver	**F** F 8
	FSEM	FSEM, Safe contact expander module for safety related applications up to cat. 4 ref. EN954-1, 3 normally open contacts / 1 normally closed contact Safety category 4, PL e, Sil 3	**F** F 9
		ASI-BWS-007S, safe active AS-i-Safe module, connection by M12 plug or terminals, cat. 4 ref. EN954-1 and IEC 61508 / SIL3.	**F** F 10
	AKAS®	Press brake safety AKAS®, electromotiv driven full automatic support, cat. 4, with or without integrated safety functions Safety category 4, PL e, Sil 3	**G** G 1
	safety foot pedal	Single safety foot pedal FL1-528ZSD4-U	**H** H 1
		Double safety foot pedal FS2-528ZSD4-U	**H** H 2
	FLSC-Scanner	Proximity laser scanner FLSC-S3A, incl. software, cat. 3 ref EN 954	**I** I 1
	**safety mats**	Safety contact mat, optional surface materials such as aluminium, stainless steel or oil resistant coverings, cat. 3 PL d	**J** J 1

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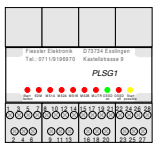
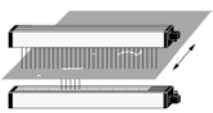
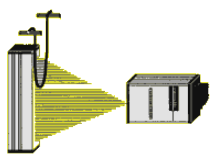
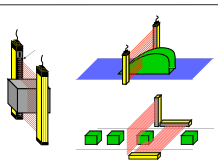
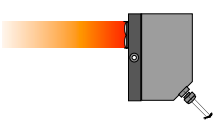
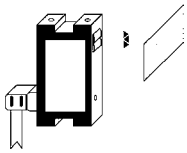
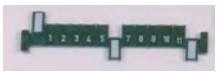
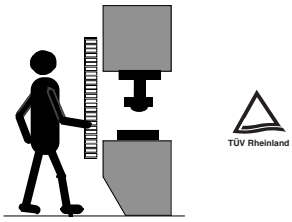
Product overview

			Page
	PLSG	Snap-On compact safety controller PLSG 3 for safety light barrier type ULVT and BLVT, programmable without PC, with display Safety category 4, PL e, Sil 3	**L** L 1
		Snap-On muting controller PLSG 1 for safety light barrier type ULVT and BLVT, programmable without PC, muting sensors directly connectable Safety category 4, PL e, Sil 3	**L** L 1
	**PLSG-K**	Muting controller PLSG 1K for DIN-rail mounting Safety category 4, PL e, Sil 3	**L** L 2
	PLSG-K	Compact safety controller PLSG 3K for DIN-rail mounting, ,programmable without PC, with display and safety relay Safety category 4, PL e, Sil 3	**L** L 2
	FPSC	Fiessler programmable safety centre FPSC, Safety-PLC basic configuration for safety related stand alone applications Safety category 4, PL e, Sil 3	**L** L 3
	**GLSL**	Hole detector GLSL, scanning field up to 2750mm optional transistor or relay output, 2V DC or 230V AC	**P** P 1
	GSD-II	GSD-II analogue loop-detector, output 0-20V, 0-10V, and 4-20mA, visualisation by LEDs	**P** P 2
	**CCD**	CCD- analogue loop detector for wires and tubes	**P** P 3
	SLVT	Area sensor for controlling and counting SLVT, beam space 7,5mm or 30mm, detection range up to 24m, scanning heights 100-1900mm. model 40X60mm	**P** P 4
	**MLVT**	Scanning light curtain for measurement applications MLVT, beam space 7,5mm or 30mm, detection range up to 24m, scanning heights 100-1900mm. model 40X60mm, output: RS 485	**P** P 5
	**light beam**	Multi-feature light beam MLVT , incl. reflector 100x100mm	**P** P 6

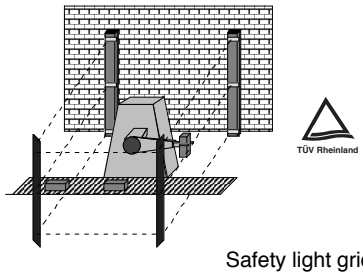
			Page
		Reflex light barrier (Muting sensor) GR 5/24, 24 V output: relay or transistor, optional with cable or M12 plug	**P** P 7
	**Conveyor technique**	Coding strip principle: folding	**P** P 8
	Conveyor technique	Coding strip principle: tilting	**P** P 8
	Conveyor technique	Coding strip principle: shifting	**P** P 8

Delivery program

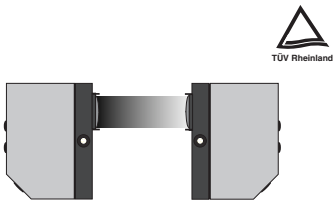
Fiessler Elektronik
Kastellstr. 9 D-73734 Esslingen
Telefon: 0711 / 91 96 97-0
Telefax: 0711 / 91 96 97-50
WWW.fiessler.de
E-Mail:info@fiessler.de



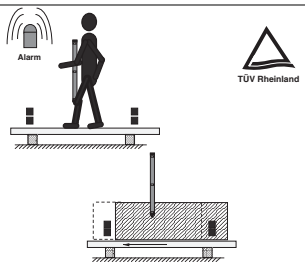
Safety light curtain



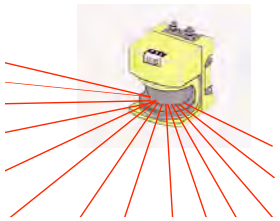
Safety light grid



Single safety light beam

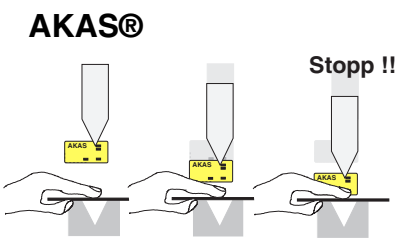


Saftey light grid with muting function



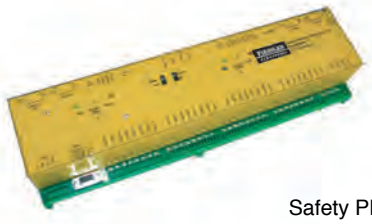
Proximity scanner

Safety mats

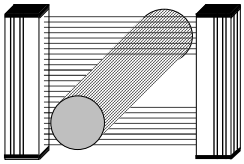


Press brake safety system

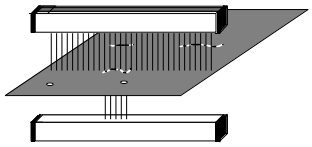
Safety foot pedal



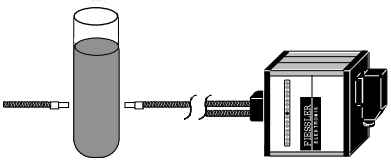
Safety PLC
Safety controllers



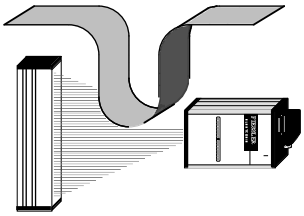
Measuring and controlling light curtains



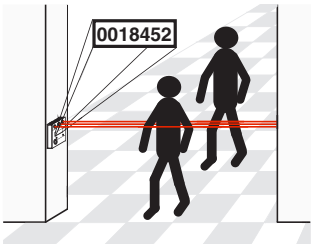
Hole detectors



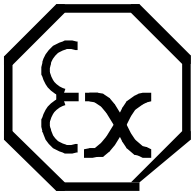
Turbidity sensors

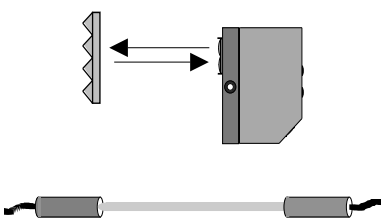


Analogue loop sensors



Counting light barriers





Light barriers for general purposes

Your application

Fiessler Elektronik
D - 73734 Esslingen
Kastellstr. 9
Telefon: +49 (0) 711 / 91 96 97-0
Telefax: +49 (0) 711 / 91 96 97-50
Internet: http://www.fiessler.de
eMail: info@fiessler.de

C

FIESSLER ELEKTRONIK

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

FIESSLER ELEKTRONIK

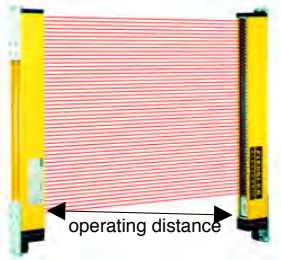
Safety category	housing B x T (mm)	resolution (mm) range (m) finger protection	resolution (mm) range (m) hand protection	resolution (mm) range (m) body protection	resolution (mm) range (m) body protection	resolution (mm) range (m) body protection	resolution (mm) range (m) access protection	resolution (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
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

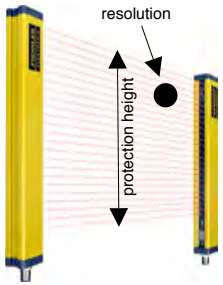
1) with Snap-on Muting controller PLSG1 up to PLSG 3 or DIN rail mounted PLSG1K up to PLSG3K or safety PLC FPSC
2) with DIN-rail mounted Muting controller PLSG1K up to PLSG3K or safety PLC FPSC
3) with Snap-On compact safety controller or DIN rail mounted PLSG3K or safety PLC FPSC
4) with compact safety 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

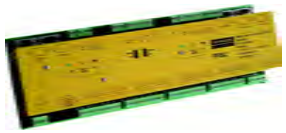
Snap-On safety Muting controller
PLSG1/ PLG2
Snap-On compact
safety controller PLSG 3

Self supporting columns



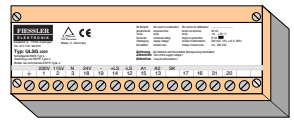
ULCT - BLCT
TLCT - ILCT

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

page

Safety sensors C

-Type 4 Safety-light barrier / curtain (selection table) C
Safety light curtains, Safety light grids ULVT, BLVT C 1
Compact Safety light curtains ULCT, BLCT C 2
2-beam safety light ULVT 500/2R C 3
4-beam safety light ULVT 1200/4R C 4
Single beam light barrier EU2K C 5

-Typ 2 Safety-light barrier / curtain (selection table) D
Safety light curtains, Safety light grids TLVT, ILVT D 1
Compact Safety light curtains TLCT, ILCT D 2

-Cascading of safety light curtains and safety light grids E

-Accessories (Safety sensors) F
Plug-on relay output module LSRA , LSRA-T F 1
Self supporting columns, shock protector for safety light barriers F 2
Power supply ULSG with potential free relay outputs F 3
Blanking-Programmer BLPG, BPSG F 4
EEx-P-protection for safety light barrier Type xLVT und xLCT F 5
Protective housing IP 67,for safety light barrier Type xLVT and xLCT F 6
Laser adjustment device JHL2 F 7
FGUL Retrofit -kit for FGS/MSL to ULVT F 8
Fiessler safe expander module FSEM F 9
AS-i-Safe module F 10

-Press brake safety G
Press brake safety system AKAS® G 1

-Safety foot pedal H
Safety foot pedal FL1-528-ZSD4-U H 1
Safety foot pedal FS2-528-ZSD4-U H 2

-Safety area scanner FLSC I
Type 3 area scanner FLSC I 1

-Safety mats J
Safety mats STM J 1
Controller STM STK 41-32 J 2

-Applications K
Safety light grid for areas with heavy dirt accumulation K 1
Safeguards at guillotine shears K 2
Punching machines and presses in the metal working industry K 3
Safety for filter presses K 4

Safety controllers L

-Safety control box/ safety controller/ safety PLC (selection table) L
Snap-On safety controller for the light curtain / light grid PLSG L 1
Compact safety controller PLSG K L 2
Programmable Safety Centre FPSC L 3

-Accessories (safety controller) M
Fiessler safe expander module FSEM M 1
Human Machine Interface HMI (see Q 1) Q 1
Muting sensors (see P 7) P 7

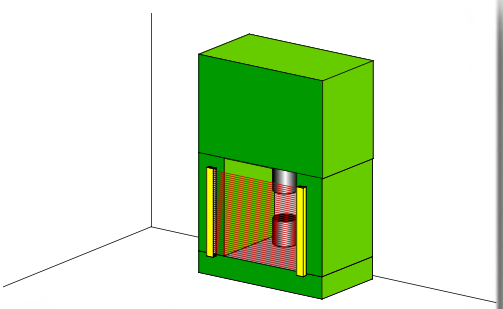
Safety-light curtains

Safety-light grids

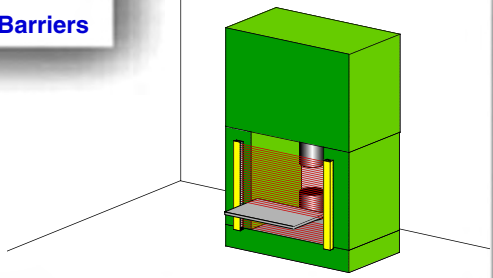
ULVT / BLVT

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

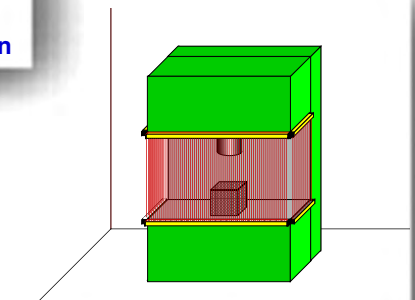


With Blanking Functions

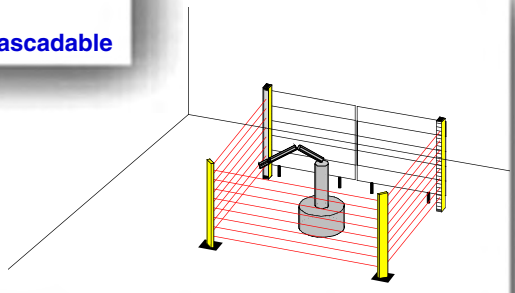
Safety For All Applications*

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

Safety Light Curtain



Cascadable



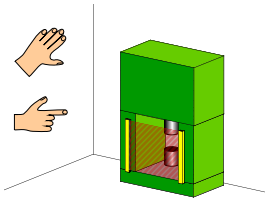
Safety Light Grids

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

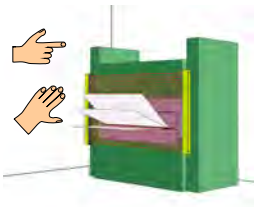
Fiessler Elektronik Kastellstr. 9
D - 73734 Esslingen

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

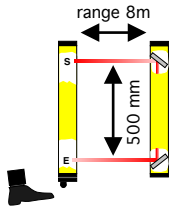
Application Examples



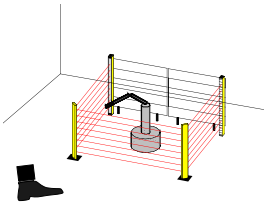
Light Curtains for the protection of dangerous sites. Protection of fingers or hands.



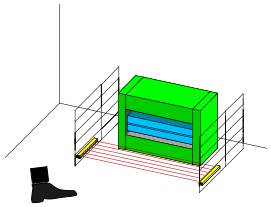
Guarding of special sections of press brakes with light curtains featuring Blanking Functions



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:

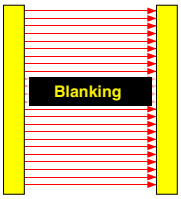
ULVT	Protection of fingers, hands, or pedestrian access guard	Resolution 14 - 500 mm	Typ 4, PL e, SIL 3
BLVT	Protection of Fingers, hands, or pedestrian access guard w. blanking function,	Resolution 14 - 500 mm	Typ 4, PL e, SIL 3
ULVT500/2R	pedestrian access guard with one activ transmitter/ receiver 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.

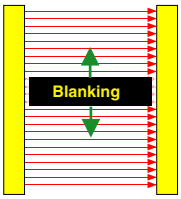
Examples For Blanking Functions

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



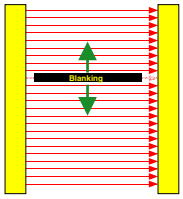
Fixed Blanking

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.

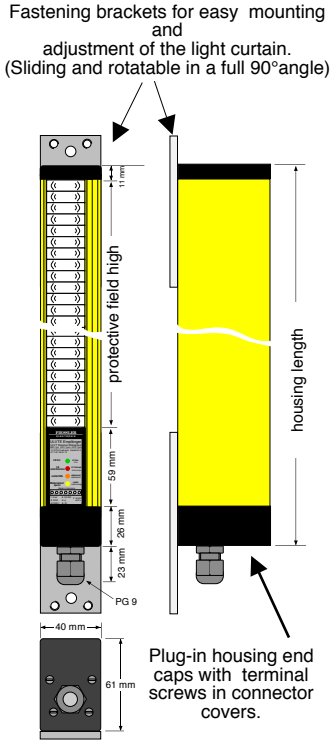


Skip 1 Beam Once

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

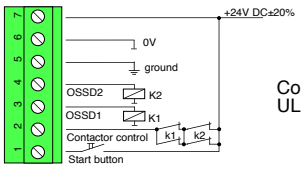
The ESPE Typ 4, PL e, SIL 3 requires the restart interlock and valve/contactor control. These characteristics are integrated standard features of the receiver head of the light curtain. Therefore, for the safe operation no additional switching unit is necessary.

Operational modes

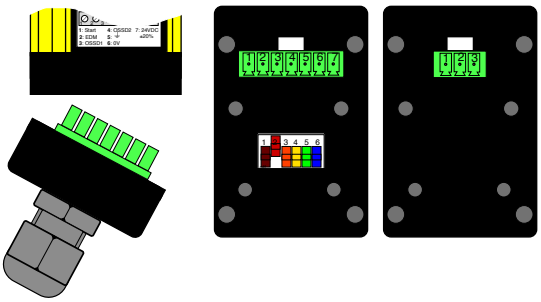
The required operational mode is user-friendly selected via dip-switches. There is no need of a computer for programming.

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.

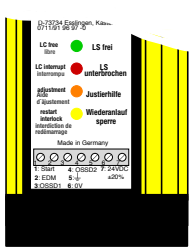


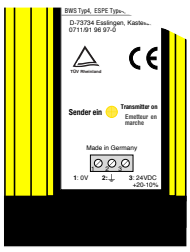
Connection Example for ULVT



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.

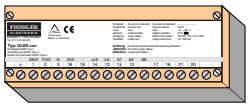
Additional functions

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

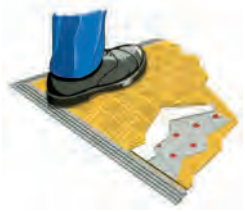
Snap-On relay output module LSRA

Other safety equipment

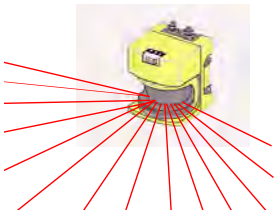
Apart from the above mentioned light curtains and light grids, Fiessler Elektronik provides other components for the protection of your work places.

Service

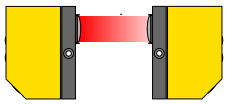
As a special feature for training our customers, Fiessler Elektronik offers one-day safety workshops. Our service team provides you with expert advice and information for the reliable integration of our safety equipment into your machine.



Safety mats

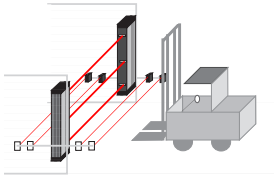


Proximity laser scanner



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.

Fiessler Elektronik
GmbH & Co.KG
Kastellstr. 9
D-73734 Esslingen

Telefon: ++49(0)711-91 96 97-0
Fax: ++49(0)711-91 96 97-50
Email: info@fiessler.de
Internet: www.fiessler.de

Fiessler Elektronik has respresentations in all major industrial nations.

FIESSLER ELEKTRONIK

Data sheet

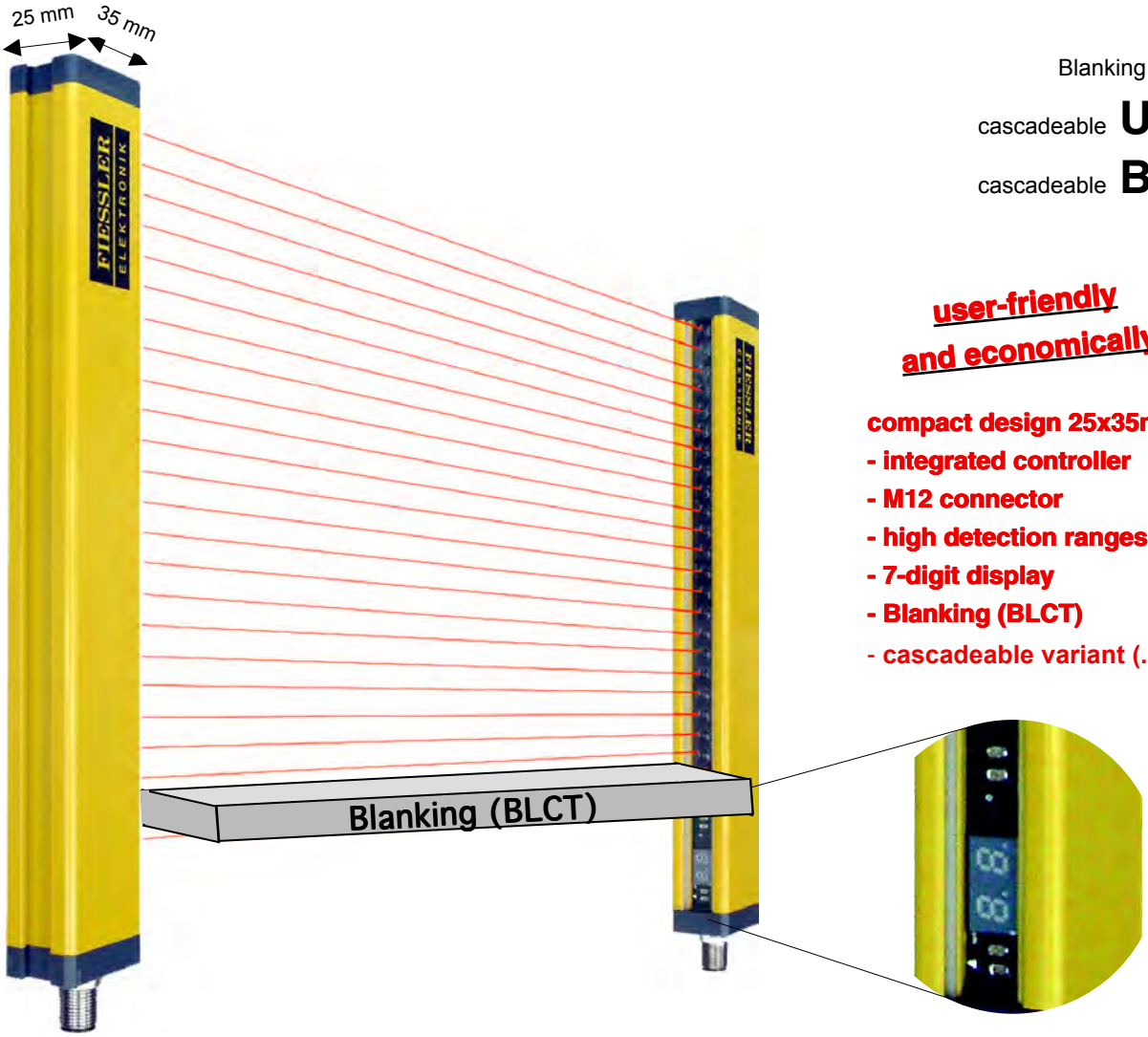
Compact Safety Light Curtains

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

TÜV

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

ZERT
DIN EN ISO 9001
Reg.Nr. 96007

integrated controller
-selectable valve control and restart interlock

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

connection via M12 connector / 7-digit display

optional

compact design 25 x 35 mm with flexible swivel mounting

TÜVRheinland c us

very short response times and large detection ranges

CE

protection heights until 1500 mm in steps of 100 mm

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

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.

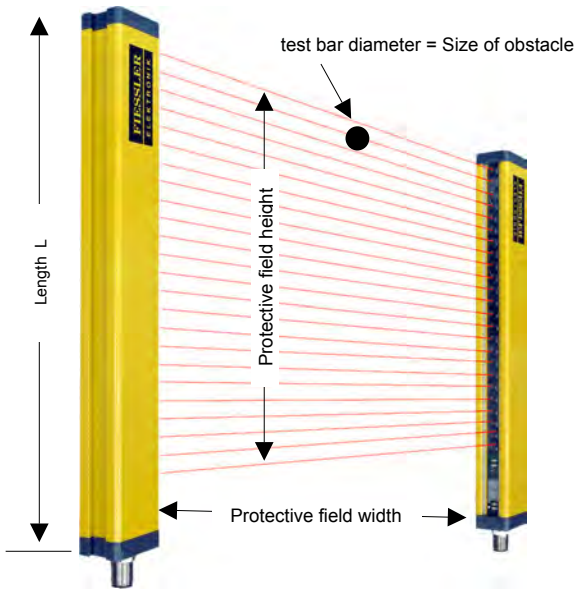
If an object enters the protective field, i.e. if at least one light beam is interrupted, the receiver's two outputs stop the machine or prevent it from starting, thus avoiding hazards.

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 Finger protection Resolution: 14 mm Range: 5 m	ULCT Hand protection Resolution: 30 mm 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

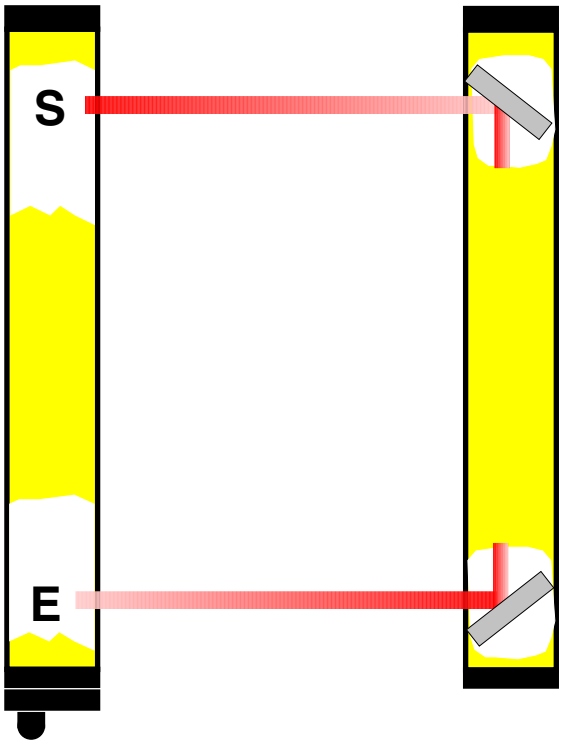
Order code of **cascadable light grid:**
additionally **K** in the type designation

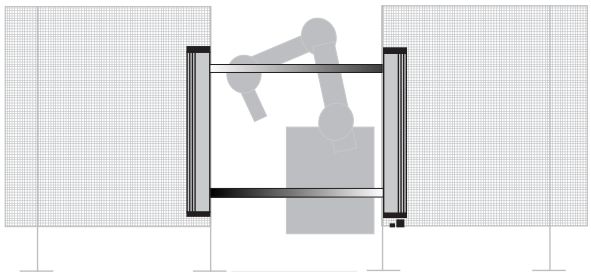
i.e. Type: ULCT-K 300/36

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

Safety class 4 safety light-grid

ULVT 500/2R





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

- **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** — optional
- **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**

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.

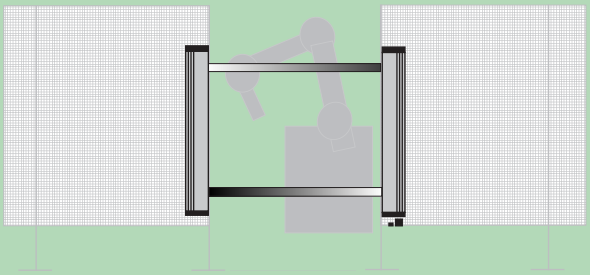
When entering the protective field, the light beams are interrupted and the machine will be reliably stopped.

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.:



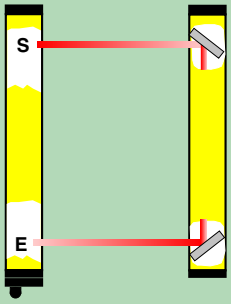
- metal presses for wood, plastic, rubber, leather, glass processing
- filter presses
- folding and bending machines
- injection moulding machines
- machining centres and welding presses
- pick-and-place machines
- robots, palettizers
- protecting storages
- doors and gates etc.

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

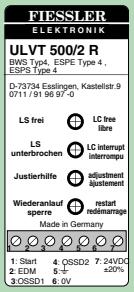
adjustment display and reading of soiling degree integrated in the receiver/ transmitter unit

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.

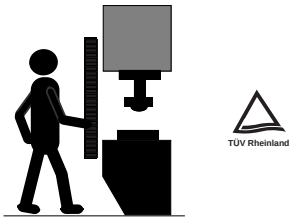
With larger mirrors, in a still larger column, arranged specifically, it is now possible to achieve a range of 15m with the system ULVT 500/2R, and thus to bridge much greater distance.

DIN EN ISO 9001
Reg.Nr. 96007

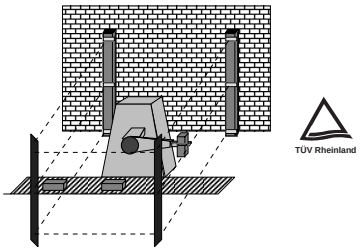
Fiessler Elektronik Kastellstr. 9
D - 73734 Esslingen
Telefon: +49 (0) 711 / 91 96 97-0 Internet: http://www.fiessler.de
Telefax: +49 (0) 711 / 91 96 97-50 eMail: info@fiessler.de

Delivery program

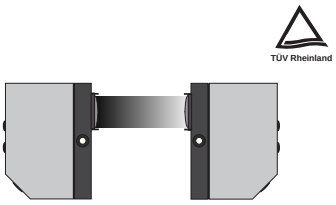
Fiessler Elektronik
Kastellstr. 9 D-73734 Esslingen
Telefon: 0711 / 91 96 97-0
Telefax: 0711 / 91 96 97-50
WWW.fiessler.de
E-Mail:info@fiessler.de



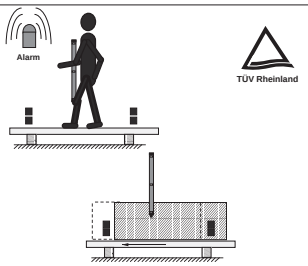
Safety light curtain



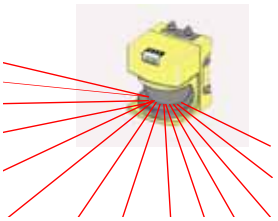
Safety light grid



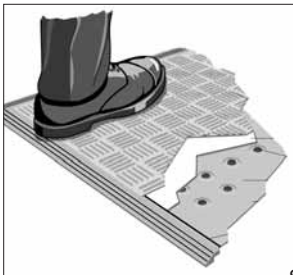
Single safety light beam



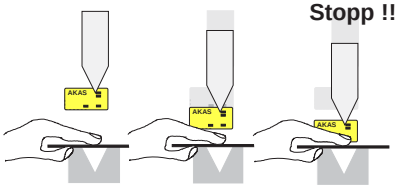
Saftey light grid with muting function



Proximity scanner



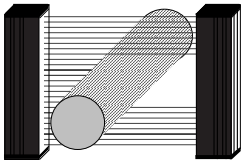
Safety mats



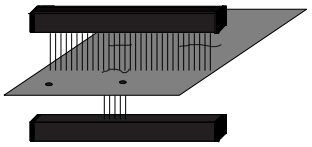
Press brake safety system

Safety foot pedal

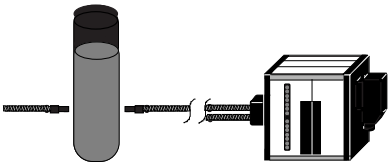
Safety PLC
Safety controllers



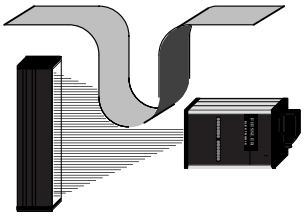
Measuring and controlling light curtains



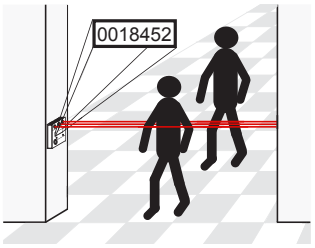
Hole detectors



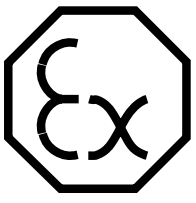
Turbidity sensors

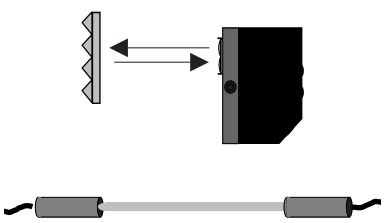


Analogue loop sensors



Counting light barriers





Light barriers for general purposes

Your application

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

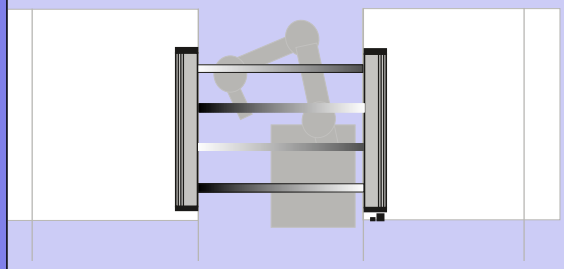
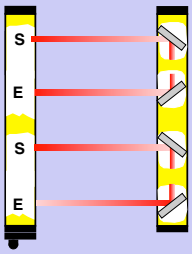
plug-in active functional unit

integrated switching unit : valve control, restart interlock

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

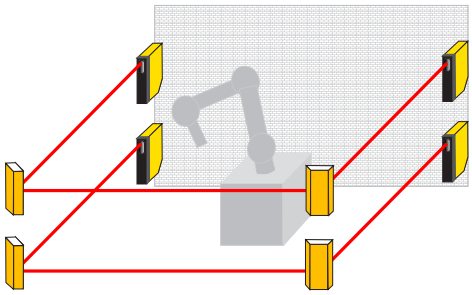
Fiessler Elektronik Kastellstr. 9
D - 73734 Esslingen

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

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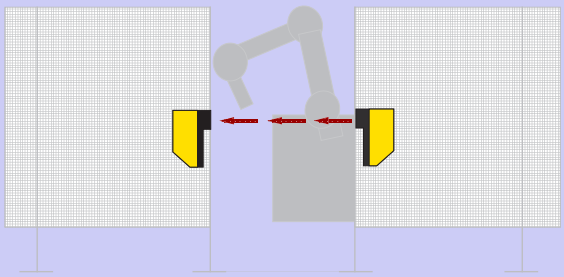
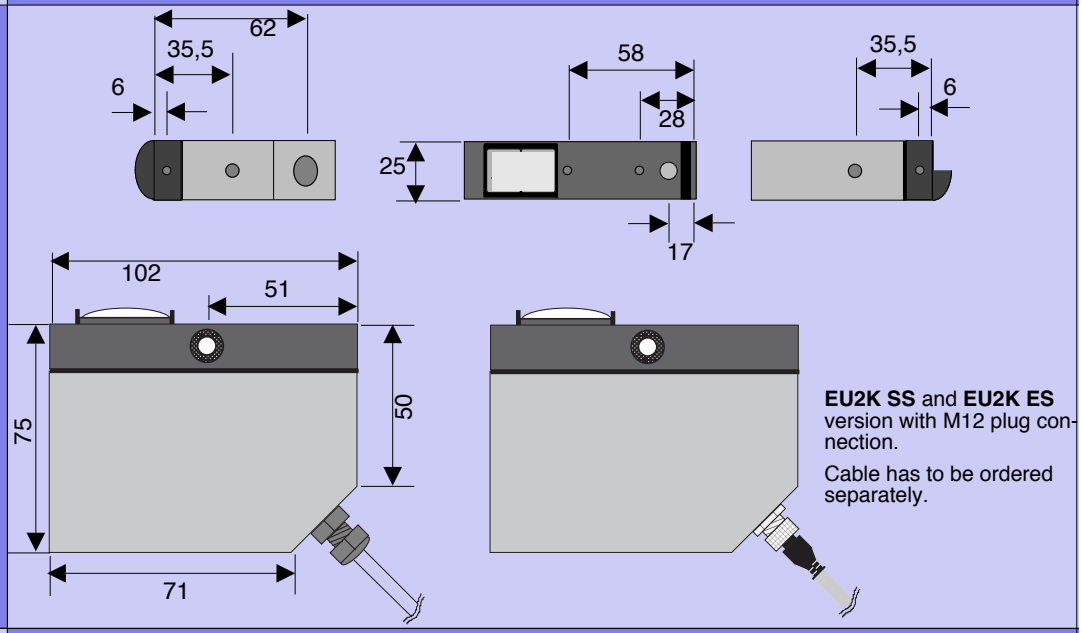
Telefax: +49 (0) 711 / 91 96 97-50 eMail: info@fiessler.de

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 - 73734 Esslingen
Kastellstr. 9
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eMail: info@fiessler.de

D

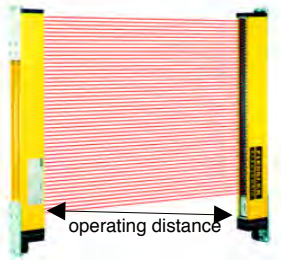
FIESSLER ELEKTRONIK

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 **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**

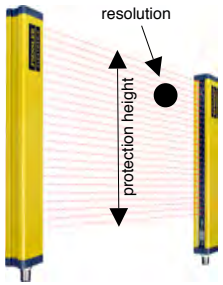
1) with Snap-on Muting controller PLSG1 up to PLSG 3 or DIN rail mounted PLSG1K up to PLSG3K or safety PLC FPSC
2) with DIN-rail mounted Muting controller PLSG1K up to PLSG3K or safety PLC FPSC
3) with Snap-On compact safety controller or DIN rail mounted PLSG3K or safety PLC FPSC
4) with compact safety 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

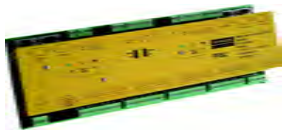
Snap-On safety Muting controller
PLSG1/ PLG2
Snap-On compact safety controller PLSG 3

Self supporting columns



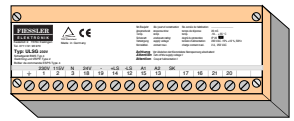
ULCT - BLCT
TLCT - ILCT

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

CE TÜV UL LISTED ZERT Ex optional

Sales agencies - Germany

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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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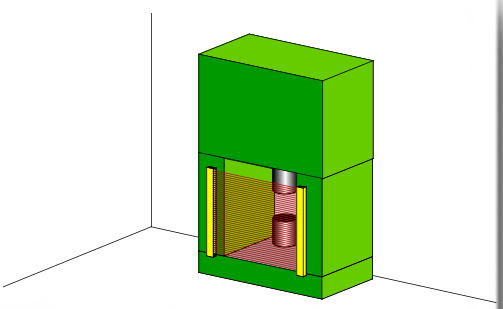
FIESSLER ELEKTRONIK

Data sheet

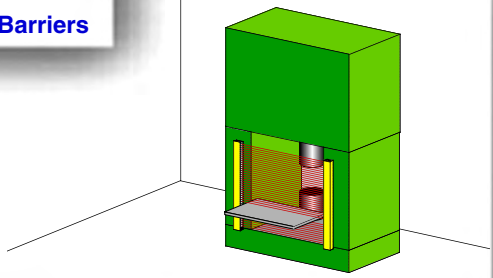
Safety-light curtains
Safety-light grids
TLVT / ILVT

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

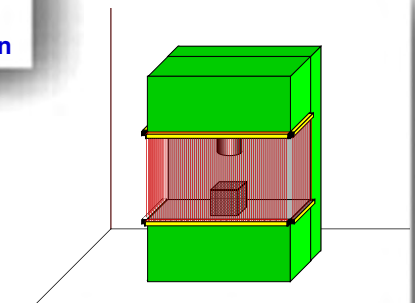


With Blanking Functions

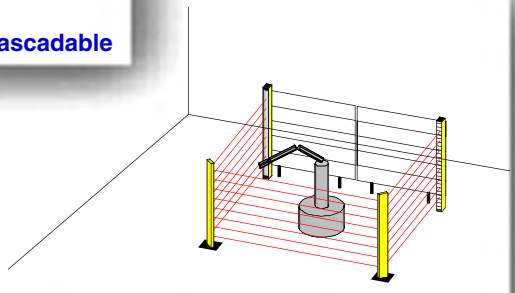
Safety For All Applications*

*** 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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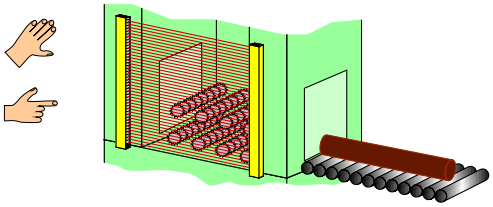
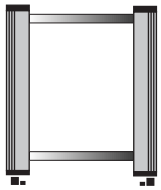
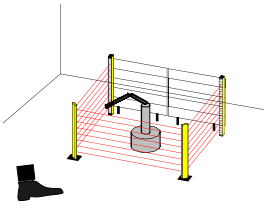
Application examples



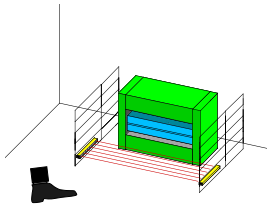
Light Curtains for the protection of dangerous sites. Protectuon of fingers or hands.



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

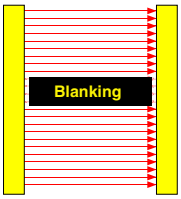
Terminology

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.

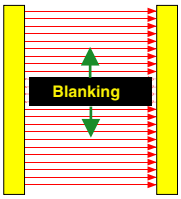
Examples For Blanking Functions

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



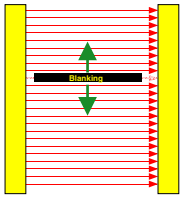
Fixed Blanking

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.



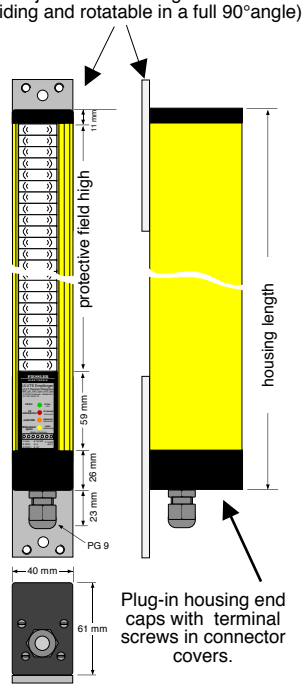
Skip 1 Beam Once

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**

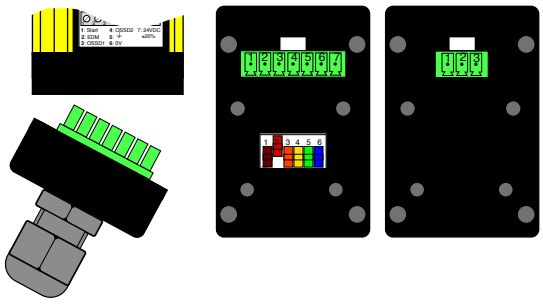
Order code: example type (**ILVT**)-protective height((**500**)-/number of beams((**35**) — **ILVT500/35 (with blanking function)**

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.

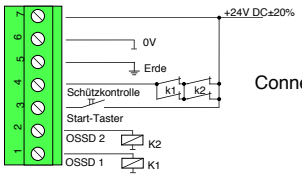


Integrated plug-in connection in the connection lid

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

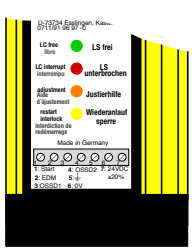
The switching capacity of 0,5 A / 24 VDC of both fail-safe outputs (OSSD1 und OSSD2) permits the direct connection of contactors or valves.

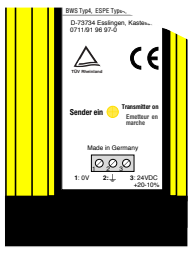


Connection Example for TLVT

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.

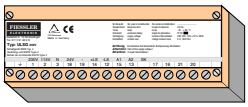
For the precise alignment of the TLVT light barriers, particularly where large distances or screening through tilted mirrors are involved, a battery powered adjustment laser is available. The device is attached to the front panel of the transmitter. A laser beam which is visible even in broad daylight,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

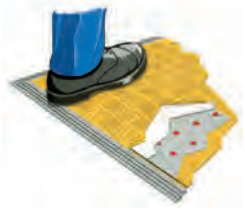
Snap-On relay
output module
LSRA-T

Other safety equipment

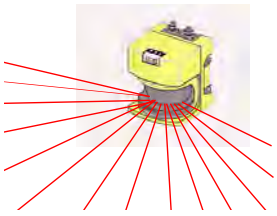
Apart from the above mentioned light curtains and light grids, Fiessler Elektronik provides other components for the protection of your work places.

Service

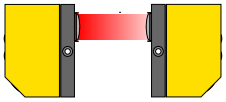
As a special feature for training our customers, Fiessler Elektronik offers one-day safety workshops. Our service team provides you with expert advice and information for the reliable integration of our safety equipment into your machine.



Safety mats

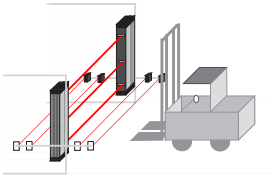


Proximity laser scanner



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.

Fiessler Elektronik
GmbH & Co.KG
Kastellstr. 9
D-73734 Esslingen

Telefon: ++49(0)711-91 96 97-0
Fax: ++49(0)711-91 96 97-50
Email: info@fiessler.de
Internet: www.fiessler.de

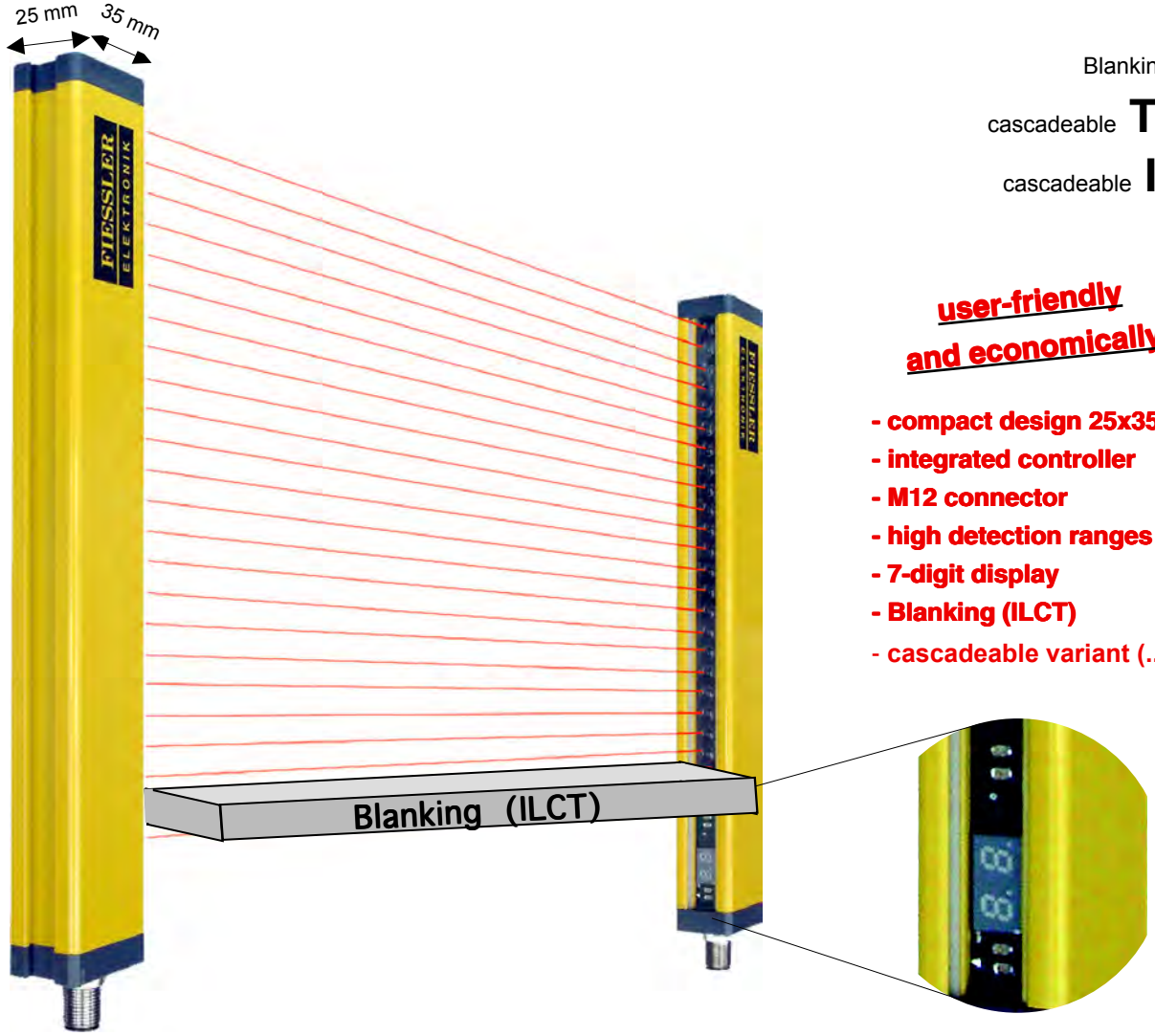
Fiessler Elektronik has respresentations in all major industrial nations.

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

TÜV

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

ZERT
DIN EN ISO 9001
Reg.Nr. 96007

integrated controller
-selectable valve control and restart interlock

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

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

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

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.

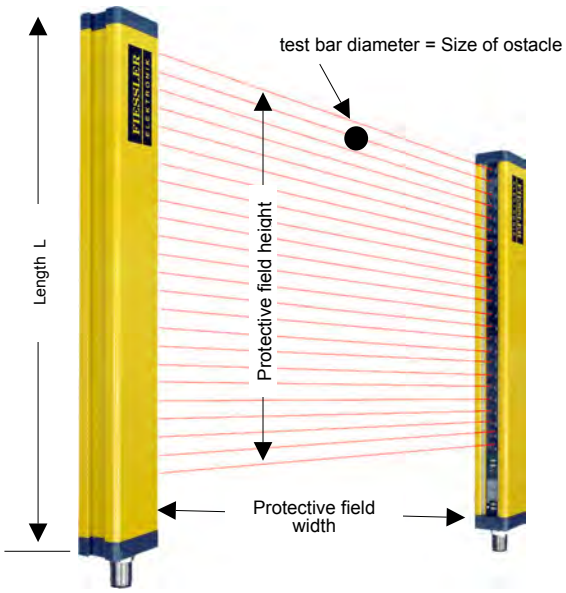
The transmitter generates infrared light beams in rapid pulses. These parallel light beams are analysed by two single-chip controllers in the transmitter. The beam spacing determines the resolution.

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.

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

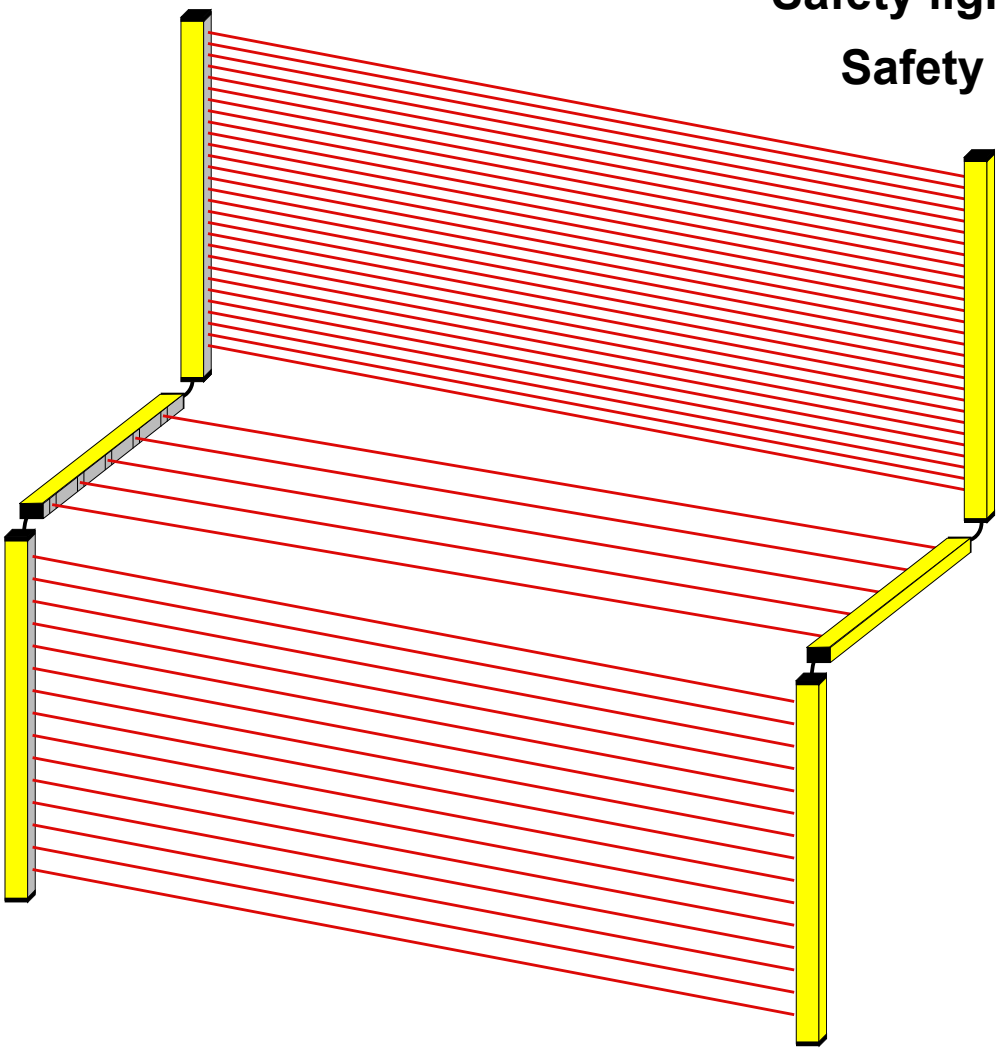
system — protective field — beam count

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

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

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

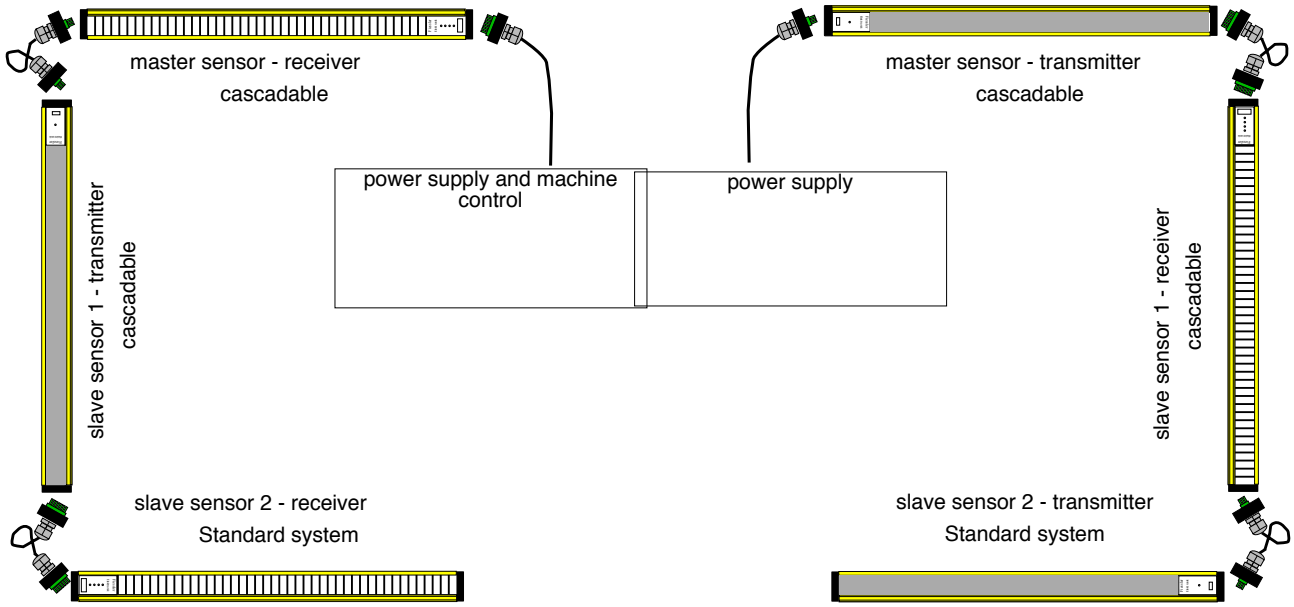
Components

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.

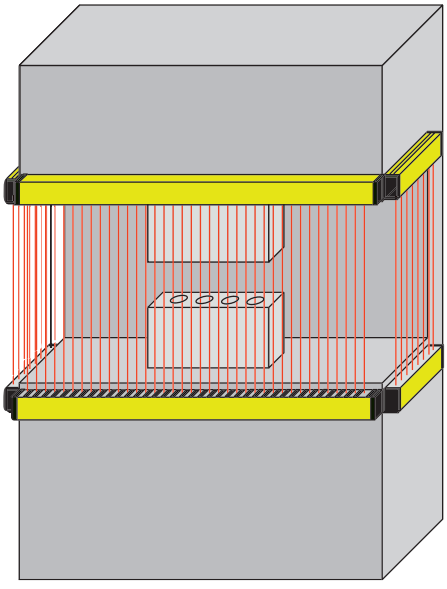
Wiring

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:

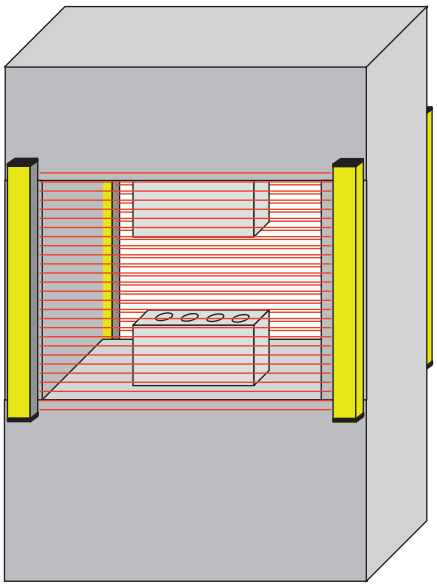


Protection at a C-Press

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

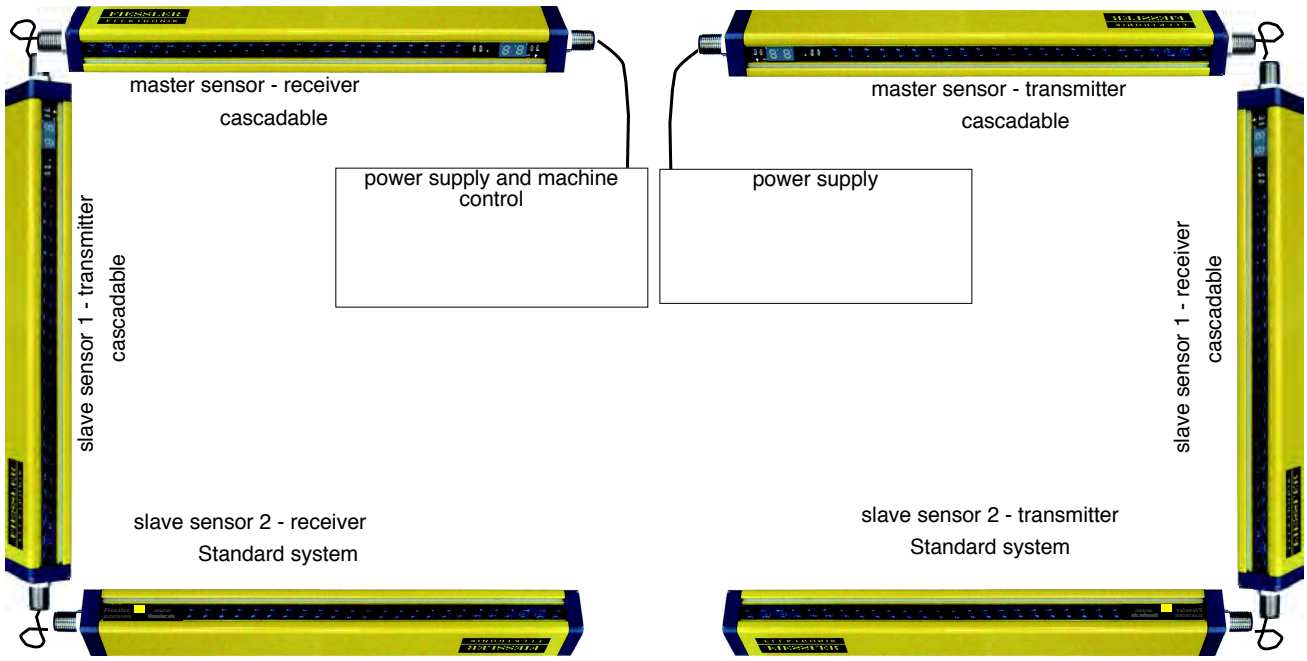
Components

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.

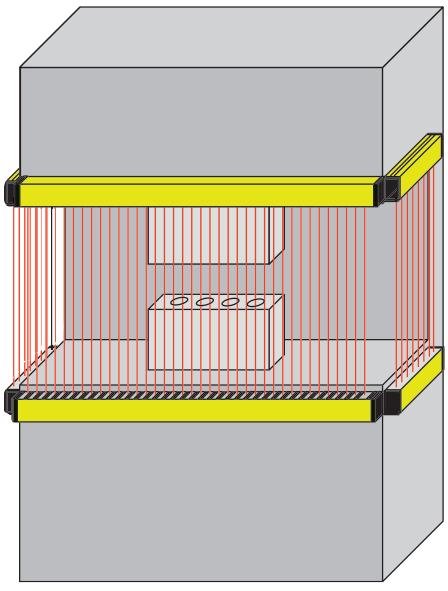
Wiring

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:

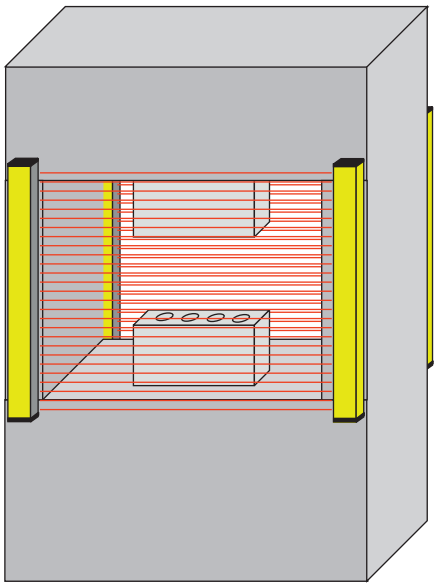


Protection at a C-Press

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

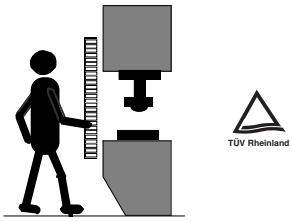
Safety light grid with protection height 800 mm, 400 mm resolution — Master sensor: cat. 4
Safety light grid with protection height 1200 mm, 14 mm resolution — Slave sensor 1: cat. 4
Safety light grid with protection height 400 mm, 30 mm resolution — Slave sensor 2: cat. 4

		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

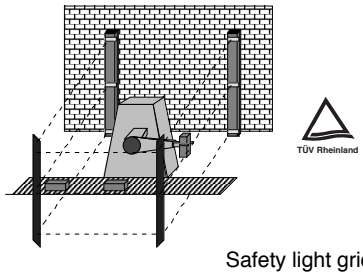
Fiessler Elektronik Kastellstr. 9
D - 73734 Esslingen
Telefon: +49 (0) 711 / 91 96 97-0 Internet: http://www.fiessler.de
Telefax: +49 (0) 711 / 91 96 97-50 eMail: info@fiessler.de

Delivery program

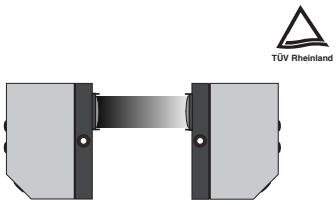
Fiessler Elektronik
Kastellstr. 9 D-73734 Esslingen
Telefon: 0711 / 91 96 97-0
Telefax: 0711 / 91 96 97-50
WWW.fiessler.de
E-Mail:info@fiessler.de



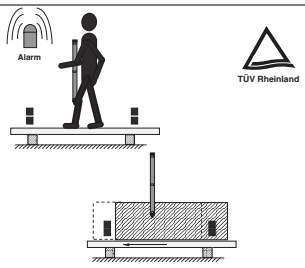
Safety light curtain



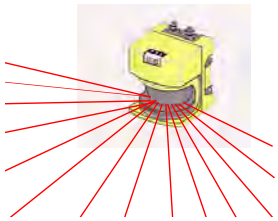
Safety light grid



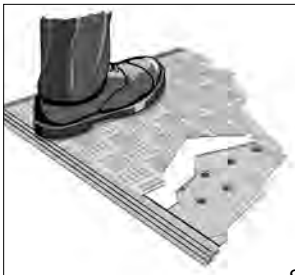
Single safety light beam



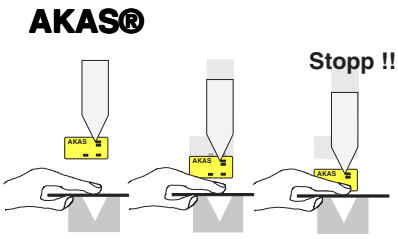
Saftey light grid with muting function



Proximity scanner

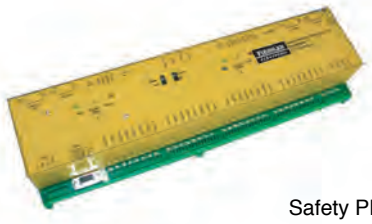


Safety mats

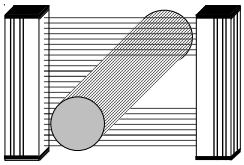


Press brake safety system

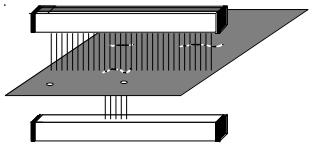
Safety foot pedal



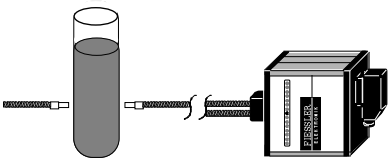
Safety PLC
Safety controllers



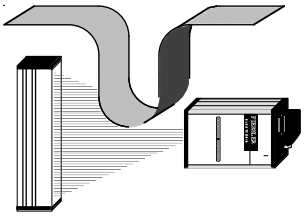
Measuring and controlling light curtains



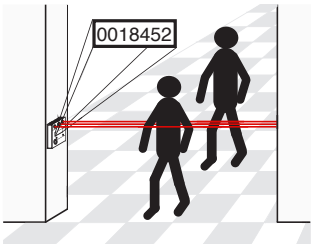
Hole detectors



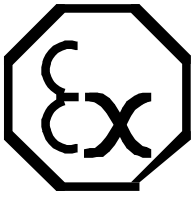
Turbidity sensors

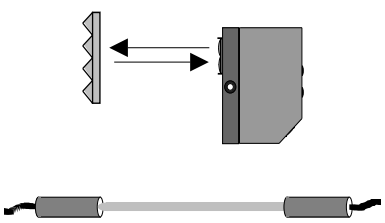


Analogue loop sensors



Counting light barriers





Light barriers for general purposes

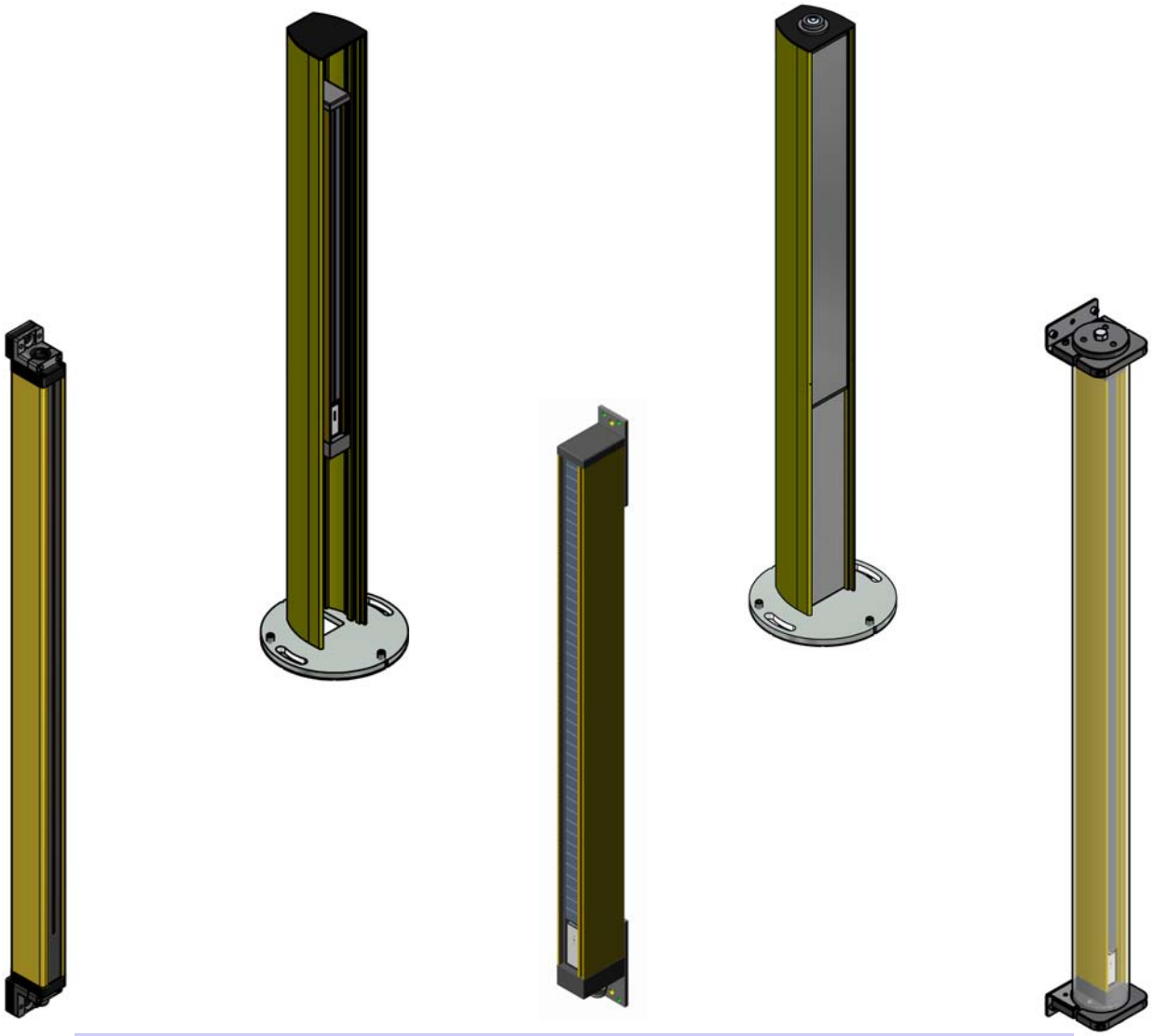
Your application

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

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

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

---

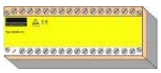
slip-on relay output (potential-free) LSRA for type ULVT, BLVT and PLSG

---

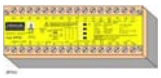
slip-on relay output (potential-free) LSRA-T for type TLVT und ILVT

---

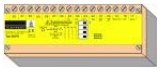
power supply type ULSG / ULSG/Duo K
for 1x or 2x ULVT / TLVT, ULCT / TLCT or FLSC,
for 115/230 VAC and 24 V DC, potential-free output contacts (Relais)



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.

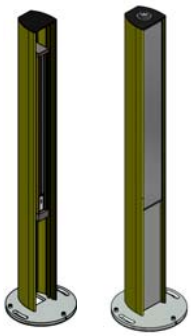
---

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

---

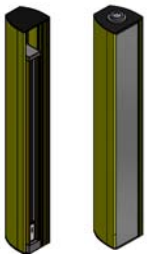
3-lead cable, price per meter**,** for XLVT transmitter
7-lead cable, price per meter**,** for XLVT receiver

mechanical accessories



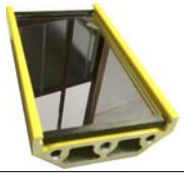
Assembly Columns (ram protection) SAU, in different heights,
for transmitter or receiver of Typ **X**LVT, incl. equalizing slab

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

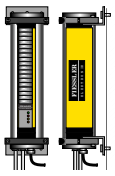
mirror column (ram protection) SDU, for transmitter or receiver,
without equalizing slab, without open space, with 2 lids as closing



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
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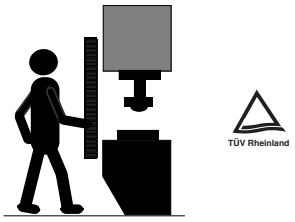
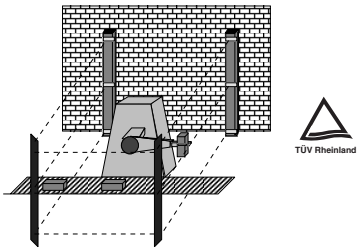
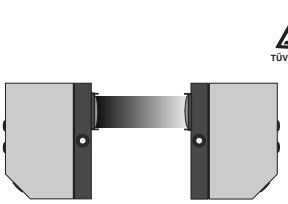


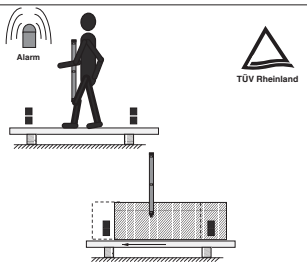
Safety light curtain



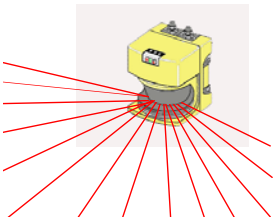
Safety light grid



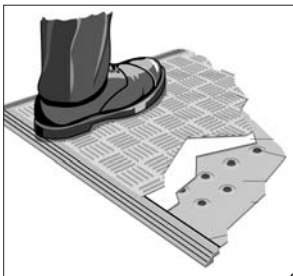
Single safety light beam



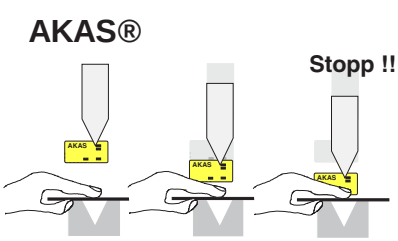
Saftey light grid with muting function



Proximity scanner



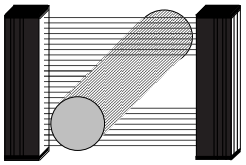
Safety mats



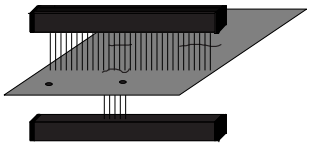
Press brake safety system

Safety foot pedal

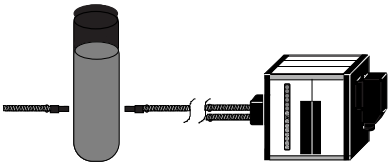
Safety PLC
Safety controllers



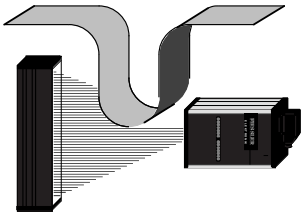
Measuring and controlling light curtains



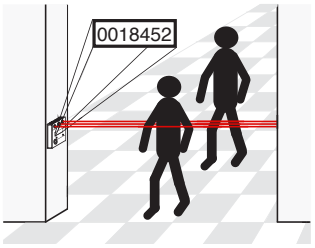
Hole detectors



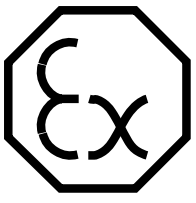
Turbidity sensors

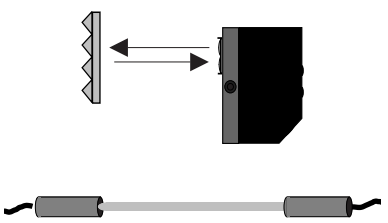


Analogue loop sensors



Counting light barriers





Light barriers for general purposes

Your application

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

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

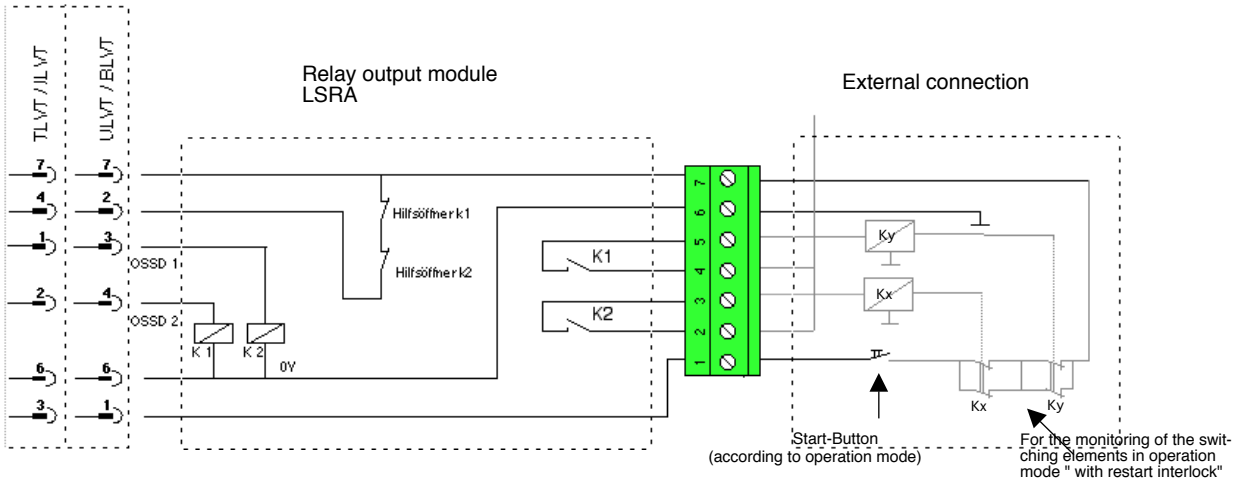
In order to directly connect the barriers to the outputs using higher currents, i.e. higher voltages, the snap-on relay output module LSRA / LSRA-T has been developed.

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

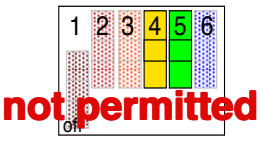
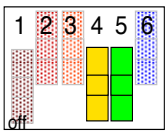


The cable layout of the cables between the terminals 2, 3, 4, 5, must be arranged in a way that there is no possibility of the conductors' short circuiting. Therefore all unprotected cables have to be installed in reinforced hoses and/or in cable channels.

Required selection of operational modes at the receiver of

ULVT / BLVT

TLVT / ILVT

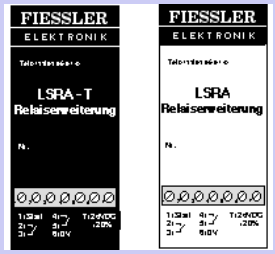
without contactor control	with contactor control	
 **not permitted**		The operation mode **with contactor control** provides the monitoring of the Relay Output Module LSRA / LSRA-T. When operating the Relay Output Module with the ULVT/ BLVT or TLVT/ ILVT , the option "Relay Output Module" must be selected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

Technical Data

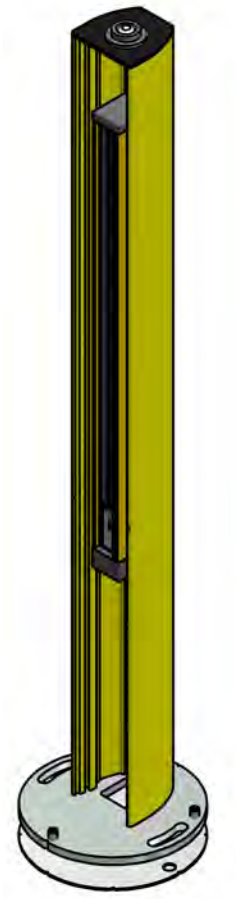
Maximum load capacity of the potential-free contacts:	5A / 50V
Dimensions in mm:	L: 116, B: 46, H: 70
Weight :	200g

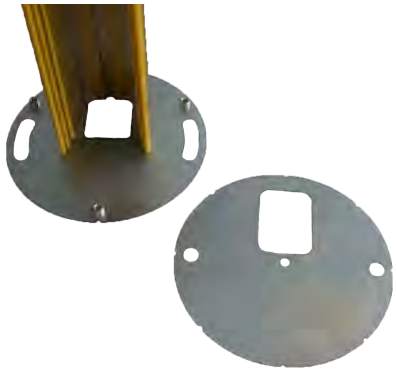
LSRA ---> use with ULVT / BLVT

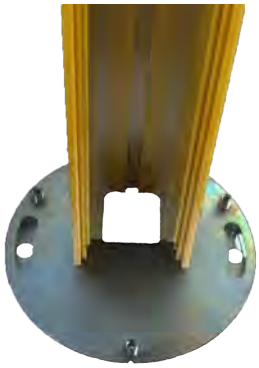
LSRA - T ---> use with TLVT / ILVT



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

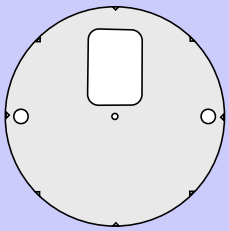
Fiessler Elektronik Kastellstr. 9
D - 73734 Esslingen

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

Shock protecting supporting column for free standing light curtains and light grids and integrated deflection mirror XLVT. Easy to install by mounting the floor plate on the floor. The column can be adjusted by using three adjusting screws on the floor plate. The light barrier is easy to install by fixing its brackets on inside the column at the rear end into the provided grooves.
In this channel the height of the position of the light barrier is adjustable at random, this is of help during the height adjustment. By unscrewing of only two screws, the transmitter or receiver of the light barrier is easily exchangeable.**The Shock Protector (as option, a plexiglass front window is availabe)** protects the light barrier or the deflection mirror from water, dirt, falling objects and damages by vehicles (fork lift trucks, e. g.). The shock protector can be either fixed to the floor by screws or be firmly installed at a machine housing or at a wall. At the rear end of the panel, two grooves are provided to screw down the housing.

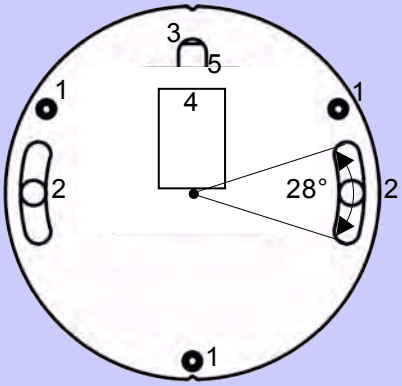
Floor plate



Grooves in the base plate allow to turn the base plate in an angle of exactly 45° to each side.
This feature enables an easier adjustment of the mirror column as well as of the mounted light curtain / light grid.

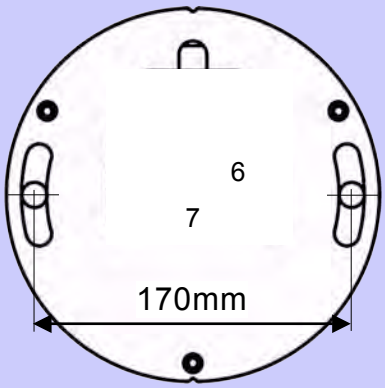
Column

Column assembled with XLVT



1: Three adjustment screws for adjusting the column
2: Two elongated mounting holes for fastening the base plate on the floor and for fine adjustment of the column (max. M12 screws)
3: Cable duct
4: Groove for fastening the light barrier by using the brackets (brackets are included in delivery)
5: Fastening grooves for fastening the column (without base plate) on a machine or on the wall.

Column assembled with mirror



Column assembled with mirrors:
The mirror is mounted in the groove no. 6 of the column.
During adjustment of the column, please observe that the central point of the mirror has to exactly correspond to the central point of the column.

During installation of the floor plate , please observe that the distance between the drilled holes must be 170 mm.
The elongated mounting holes allow to turn the colum with its floor plate in an angle of 14° to each side.
The three adjustment screws allow a perpendicular adjustment of the column.

During adjustment of the column please observe that the central point of the column is exactly correspond to the central point of the light barrier and to the mirror.
Additional plexiglass front windows are available as option.

Mechanical data

Dimensions of XLVT with e.g. 2, 3, or 4 beams (overall column height including floor plate)

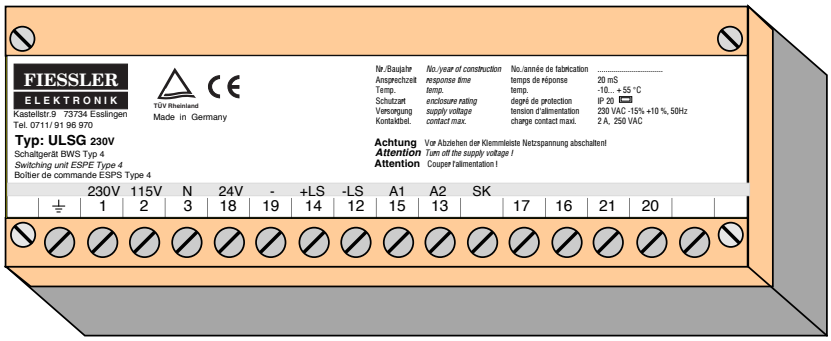
XLVT 500/2 --> 1060 mm (first beam 400 mm above floor according to EN 999 / DIN ISO 13855 / EN 62046)

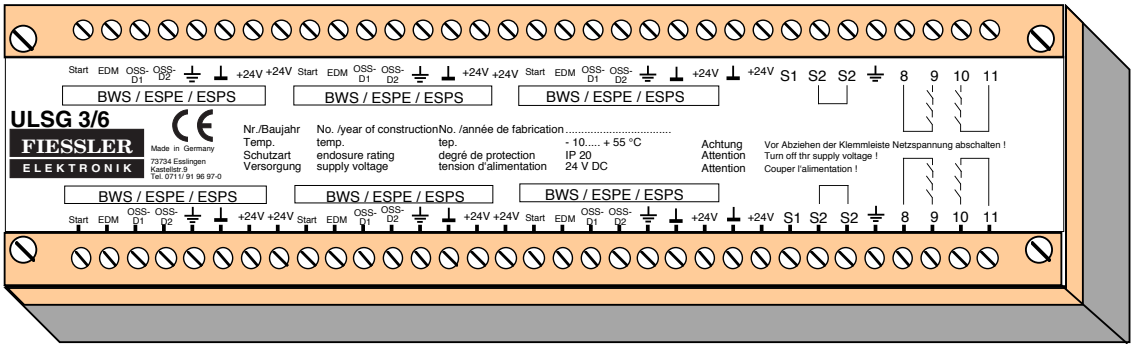
XLVT 800/3 --> 1060 mm (first beam 300 mm above floor according to EN 999 / DIN ISO 13855 / EN 62046)

XLVT 900/4 --> 1260 mm (first beam 300 mm above floor according to EN 999 / DIN ISO 13855 / EN 62046)

ULVT 500/2R -->1005 mm (first beam 400 mm above floor according to EN 999 / DIN ISO 13855 / EN 62046)

Power supply ULSG
with potential-free relay contacts





Power supply for safety light curtains / -grids

Supply voltage 24 VDC, 115 VAC or 230 VAC

Potential-free force-guided normally open relay contacts

Connection of up to 6 safety light curtains

Easy-to-install serial connections with other safety sensors

optional

Enables the connection to common safety bus nodes

Provides a cost-saving solution for all cases without power supply

Offers high switching performance

DIN EN ISO 9001
Reg.Nr. 96007

Application

The switching unit ULSG provides potential-free, force guided, normally open relays and a flexible power supply (for 230 V AC-, 115 V AC or 24 V DC connection). The ULSG fulfils the power-failure bridging standard of 20 ms specified by EN 60204 and is therefore suitable for supplying the safety light curtains **ULVT / BLVT / TLVT / ILVT, ULCT / BLCT / TLCT / ILCT and the proximity laser scanner FLSC** with a voltage.

With the switching unit ULSG 3/6 the connection of up to 6 ULVT / BLVT safety light grids is possible.

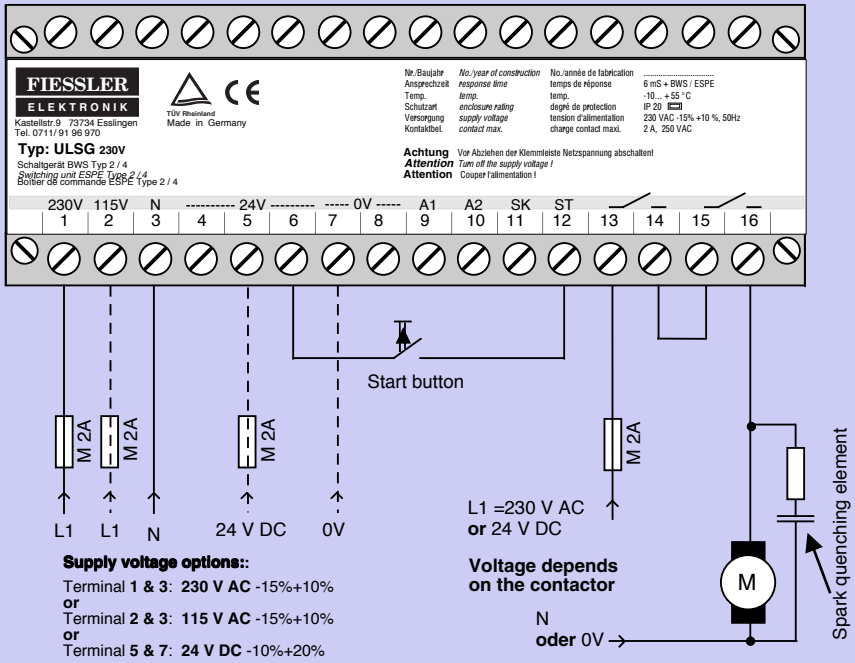
With the switching unit series ULSG there are the following functions possible;

- **ULSG with** restart interlock / **with** external device monitoring (EDM)
- **ULSG with** restart interlock / **without** external device monitoring (EDM)
- **ULSG without** restart interlock / **without** external device monitoring (EDM)
- **ULSG 3/6:** connection up to 6 safety light curtains (24 V DC)
- **ULSG 3/6:** connection **with** restart interlock / **with** external device monitoring (EDM)
- **ULSG 3/6:** connection **with** restart interlock / **without** external device monitoring (EDM)

Connection diagram

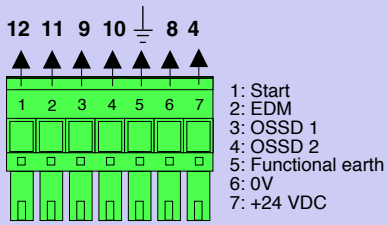
Connection example:

ULSG with restart interlock / **without** external device monitoring (EDM)



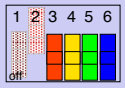
Connection of safety light curtain ULVT:

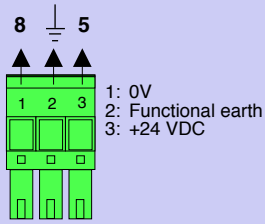
(safety category 4)



Receiver ULVTE / BLVTE

Set operating mode:
- **With contactor control**
- **With restart interlock**
- **Synchronized outputs**



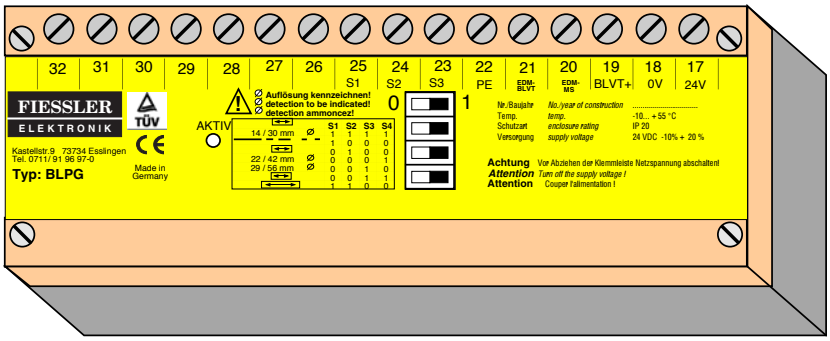


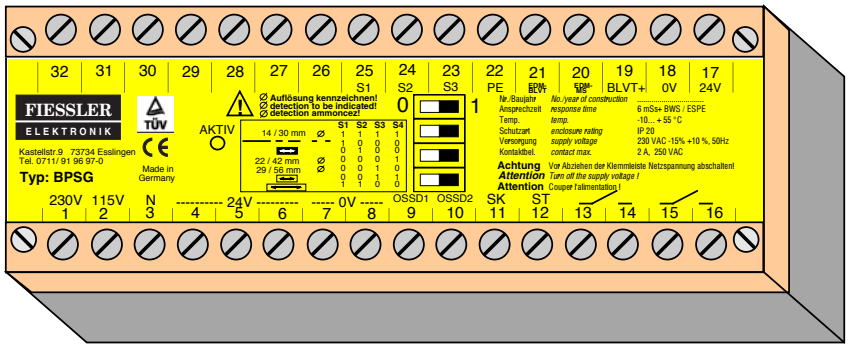
Transmitter ULVTS/ BLVTS

Technical data

Safety category:	Typ4 , PLe, SIL 3
Response time:	6 ms
Housing design:	Black insulating material, beige cover
Fastening:	Snap-on fastening on a hat rail (DIN EN 50022-35), screw fastening
Protection type:	IP 20
Protection class:	Protective insulation
Ambient operating temperature:	-10 to 55 °C
Storage temperature:	-25 to 70 °C
Supply voltage:	ULSG: 230 V AC/50Hz +10% -15%, 115 V AC/50Hz +10% -15%, or 24 V DC, + 20% - 10% ULSG3/6: 24 V DC, + 20 % - 10 %
Outputs:	The output contacts are potential-free, monitored (only in conjunction with ULVT / BLVT), force-guided and normally open with a maximum loading capacity of 2 A/250 V AC or 60 V DC, 30 W
Inputs:	EDM and start button: 0 V to 24 V DC ±20% (no extraneous voltage!)
Electrical connection:	Plug-in terminal strip
Connection cable:	max. 1,5 mm2

Blanking-programming unit
BLPG and BPSG





Easy programming of Blanking safety light curtains

Supply voltage 24 VDC, 115 VAC or 230 VAC

Potential-free force-guided normally open relay contacts

Selector switch mode

Programming unit can be removed once programming is complete

optional

Blanking-program will be stored directly in the receiver

No need of any PC for programming

Set the desired blanking mode by using the DIP switches

DIN EN ISO 9001
Reg.Nr. 96007

Application

BLPG: Blanking programming unit

A key switch is used to enable programming. The programming unit is not absolutely necessary for operating the BLVT and can be removed again once programming is complete.

BPSG: Blanking programming unit and controller

Like type BLPG, but also with a voltage supply and force-guided relay with potential-free outputs.

Mode :

with / without restart interlock/ **with / without** external device monitoring (EDM)

- external **selector switch** in conjunction with the **BLPG / BPSG**
- up to **5 different blanking functions** can be stored in, and recalled from, the BLVT light curtain

How to program:

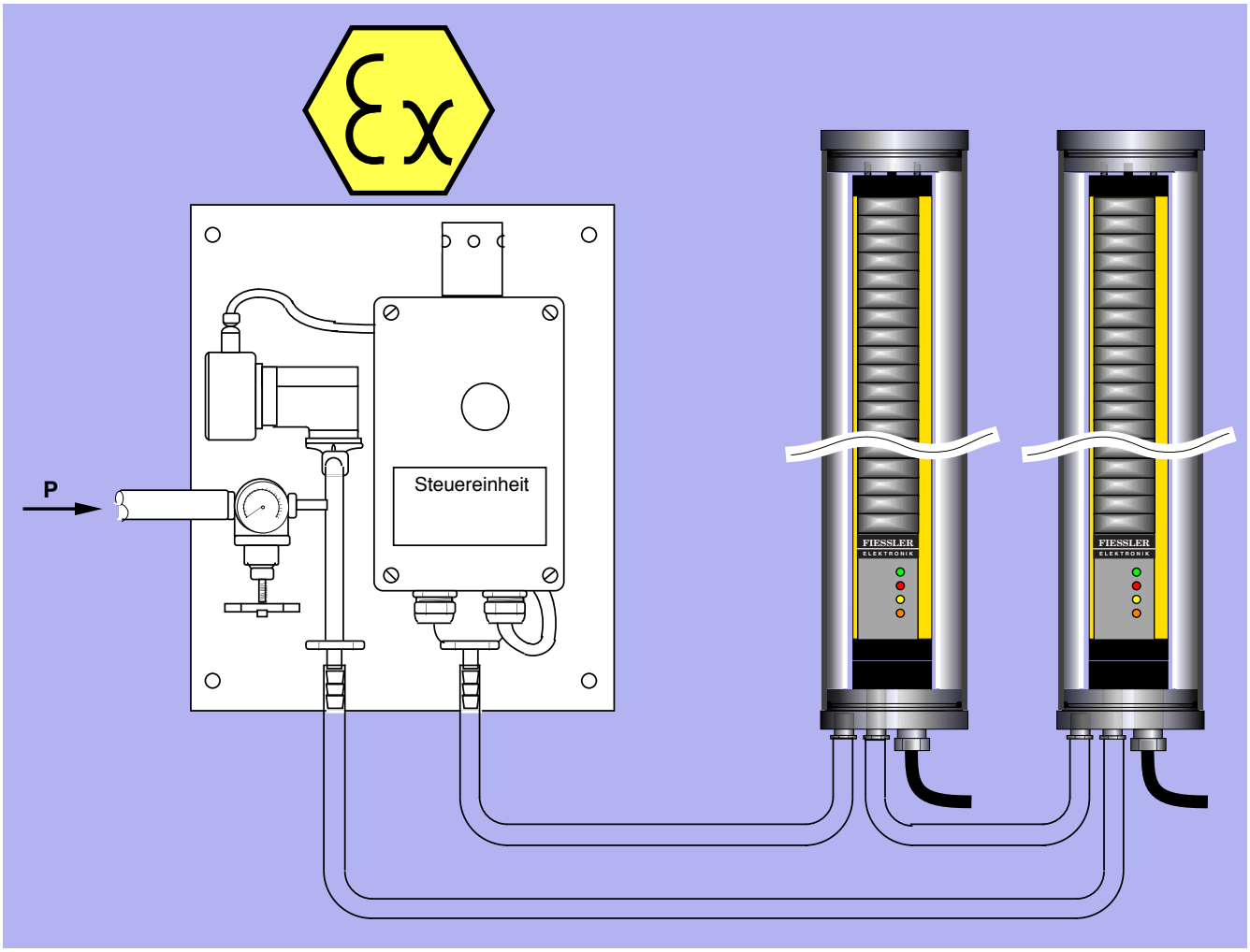
1. Set the desired blanking mode using the DIP switches (refer to the BLVT operating manual).
2. Install barriers in the protective field. These are blanked after programming. **The first beam (as seen from the plug) must not be dark, as it is needed to synchronise the transmitter and receiver.** If beam 1 is covered during teach-in, the light curtain assumes the error state and the orange and yellow LEDs on the receiver start to flash rapidly (about 4 times per second).
3. Turn the key switch to the programming setting. Wait until the controller's green LED indicates readiness for programming (about 2 seconds).
4. Remove the key switch. Programming is complete once the green LED is deactivated.
5. Test the protective field with an appropriate rod. At any point in the field, this rod must deactivate the outputs. If the blanked areas do not cover the entire protective field, additional protective grids need to be installed.
6. Affix a sign indicating the current resolution.
7. The light curtain is now ready for operation. The dynamic blanking and reduced resolution operating modes are indicated by slow flashing (about once per second) of the adjustment aid and restart interlock LEDs on the receiver (with the protective field clear).

	Dip-switch			
Blanking modes:	**S1**	**S2**	**S3**	**S4**
No blanking	1	1	1	1
Static blanking (up to 6 sectors possible)	1	0	0	0
Static blanking with 1-beam reduced resolution	1	0	0	1
Static blanking with 2-beam reduced resolution	1	0	1	0
Dynamic blanking (only 1 area possible)	0	1	0	0
Dynamic blanking with 1-beam reduced resolution	0	1	0	1
Dynamic blanking with 2-beam reduced resolution	0	1	1	0
1-beam reduced resolution	0	0	0	1
2-beam reduced resolution	0	0	1	0
Ignore 1 beam only once (full resolution for the remaining protective field)	0	0	1	1
Ignore 2 beams only once (full resolution for the remaining protective field)	1	1	0	0

Technical data

Functions:	**11 BLVT-Blanking modes programmable**, up to **5 different blanking functions** can be stored in, and recalled from, the BLVT light curtain
Safety category:	Typ4, PL e, SIL 3 **(only in connection with the light curtain BLVT)**
Response time:	6 ms
Housing design:	Black insulating material, beige cover
Fastening:	Snap-on fastening on a hat rail (DIN EN 50022-35), screw fastening
Protection type:	IP 20
Protection class:	Protective insulation
Ambient operating temperature:	-10 to 55 °C
Storage temperature:	-25 to 70 °C
Supply voltage:	BLPG: 24 V DC + 20 % - 10 % BPSG: 230 V AC/50Hz +10% -15%, 115 V AC/50Hz +10% -15%, 24 V DC, + 20 % - 10 %
Outputs:	The output contacts are potential-free (only BPSG), monitored (only in conjunction with ULVT / BLVT), force-guided and normally open with a maximum loading capacity of 2 A/250 V AC or 60 V DC, 30 W
Inputs:	EDM and start button: 0 V to 24 V DC ±20% (no extraneous voltage!)
Electrical connection:	Plug-in terminal strip
Connection cable:	max. 1,5 mm2

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
PLe 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

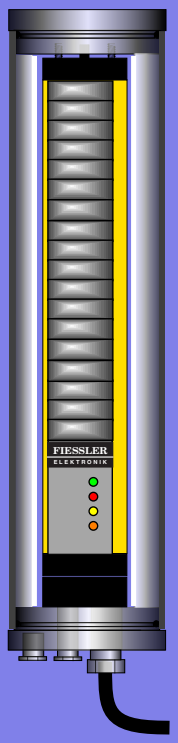
Ex-protection according ATEX 94/9 / ATEX 95

Protected enclosure

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



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.

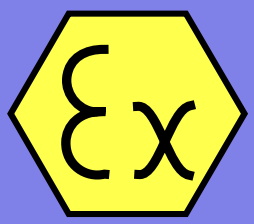
The control unit can be operated with 12VDC, 24VDC, 24VAC, 110VAC, 120VAC, 230VAC,250VAC, 48 ...62 Hz.

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.

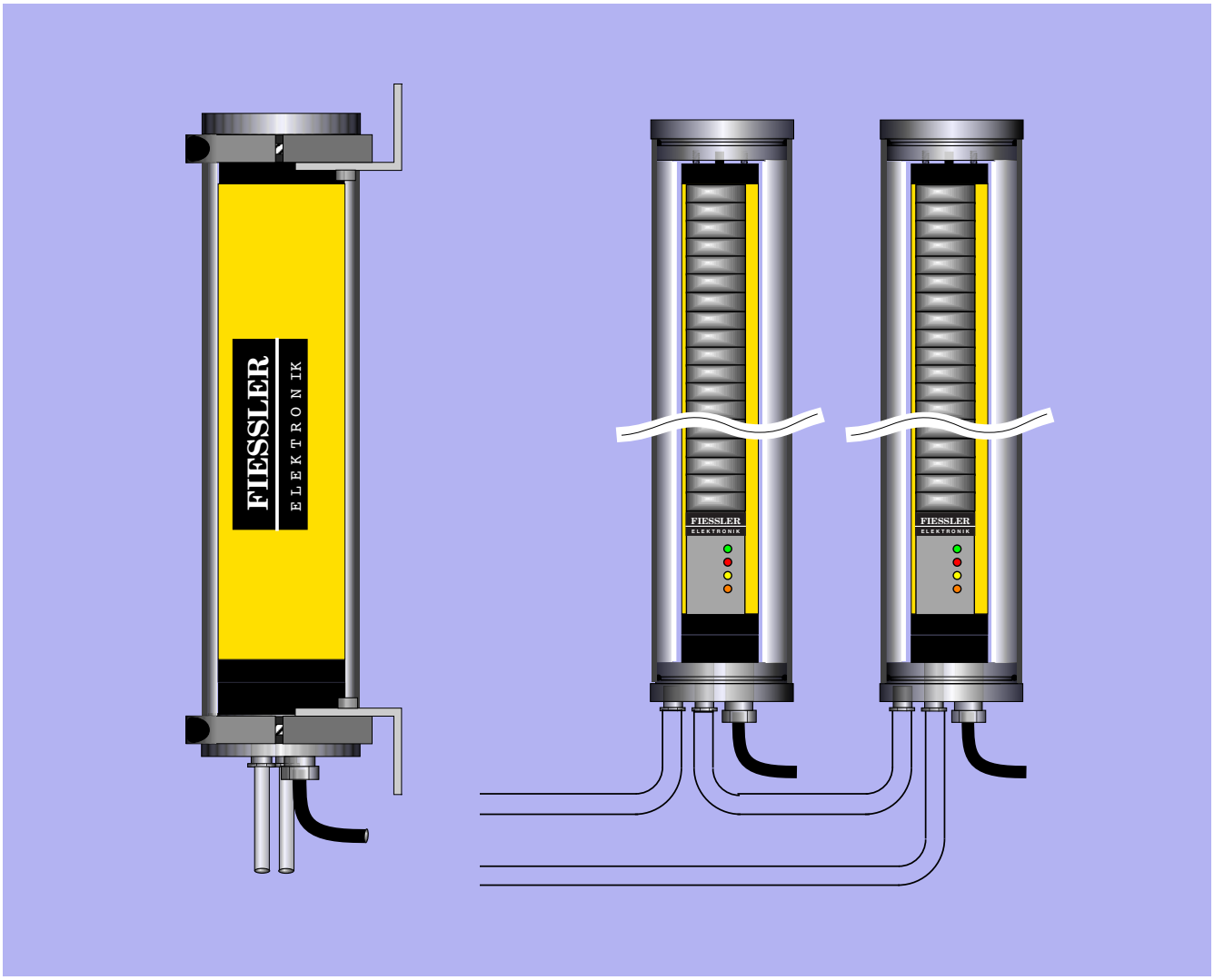
Additionally, both housing covers have connections for pressure air hoses.

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

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
PLe ISO 13849
SIL 3 EN 61508
Kat. 4 ISO 13849

Application: chemical environments

optional

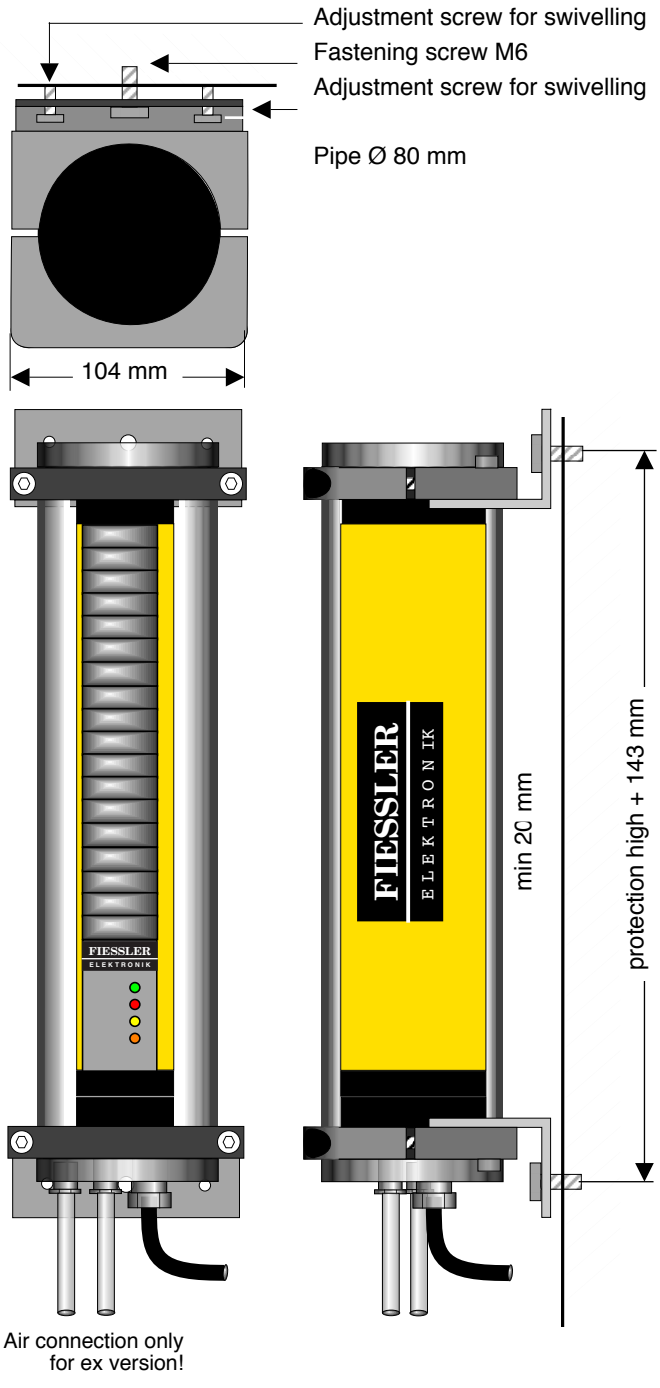
Application: food industry

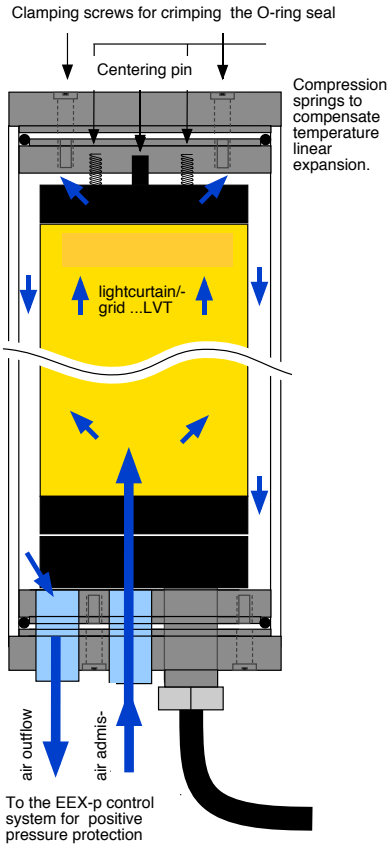
Application: Ex hazardous areas

Protective housing IP 67 for light barriers Type xLVT and xLCT

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.

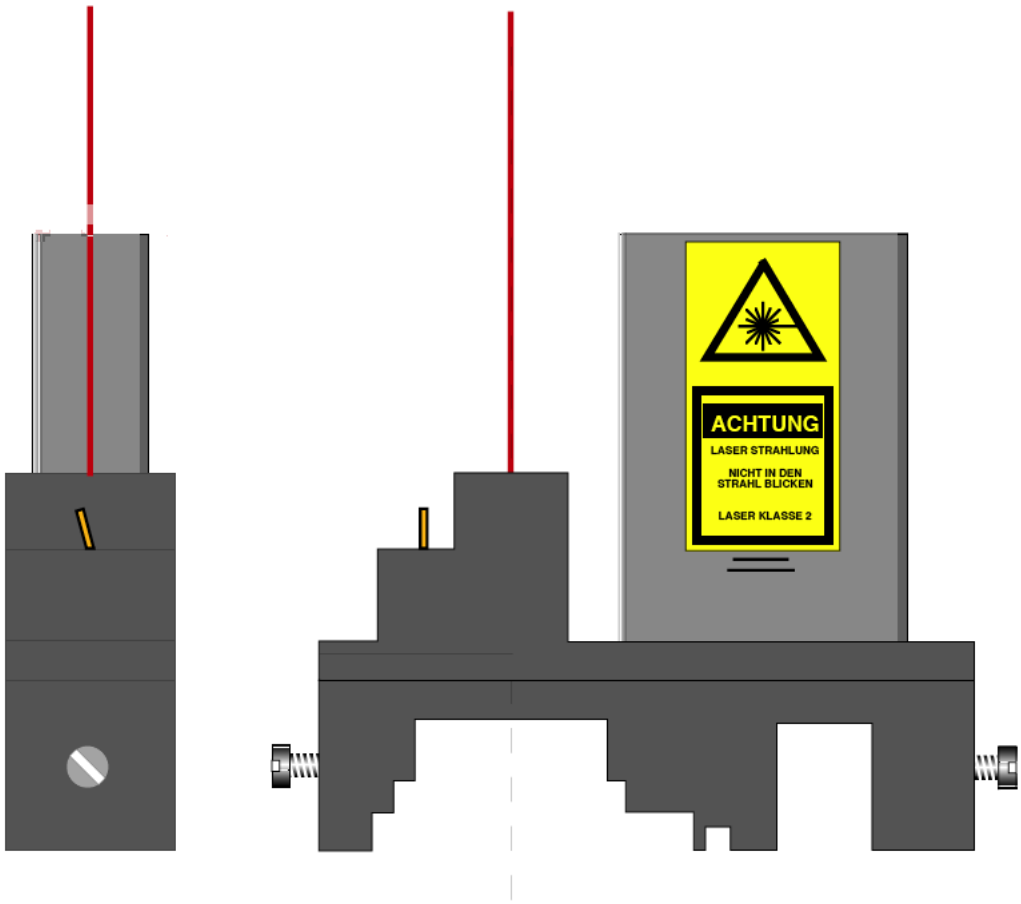
The cover with the connecting terminals becomes accessible

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

ZERT
DIN EN ISO 9001
Reg.Nr. 96007

CE

Application:

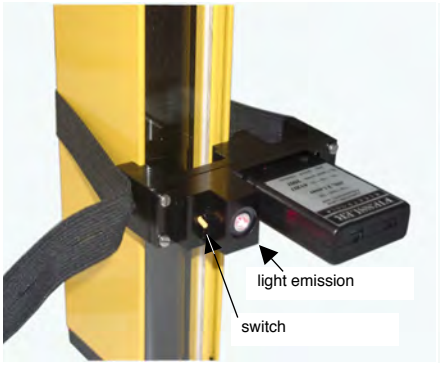
The laser adjustment aid makes the alignment of safety light curtains, -grid and barrier for long distances easy. Place the laser adjustment aid on the front window of the transmitter and receiver. The laser adjustment aid has to be evenly placed on the housing. The fixation can be carried out at the 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

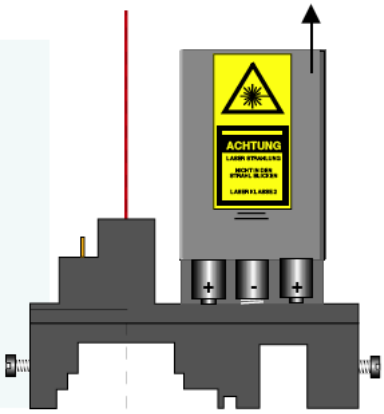
Laser class 2. Don't look directly into the laser beam!

Operation:



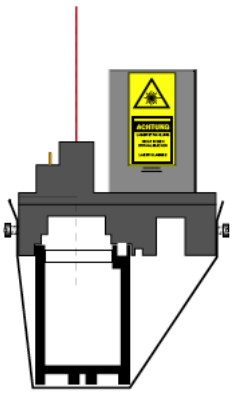
Fixation on XLVT housing

Column mounting
mount the elastic band only on one screw

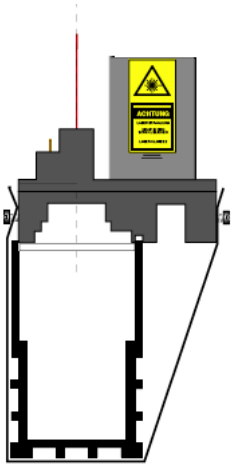


Battery change
3xAAA batteries (LR03 Micro) Alkaline

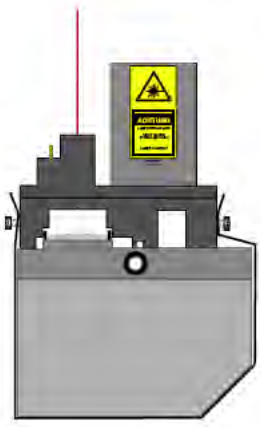
Fixation examples :

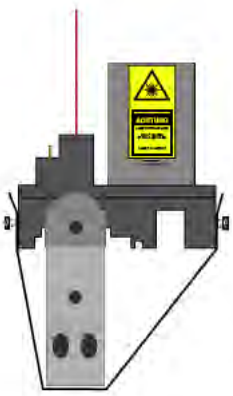


XLVT, XLCT



LSUW

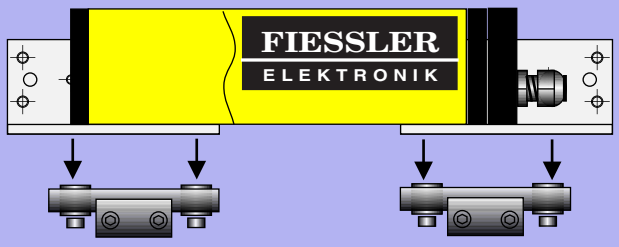




EU2K, UGC, MFL

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

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

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.

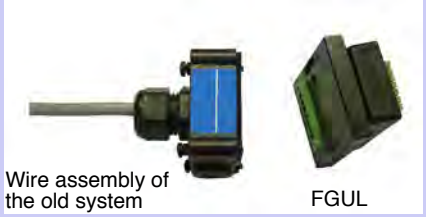
Thanks to equal or better response times of the type ULVT, there is no need to elaborate a new risk assessment and the safety distance of the installation remains the same.

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

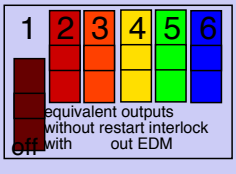
System before exchange

Disconnect and remove the wire assembly from the old light curtain



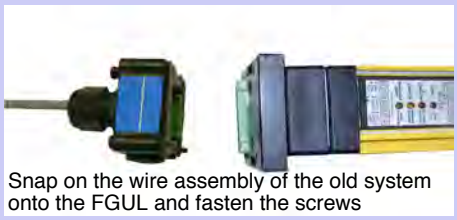
Wire assembly of the old system

FGUL



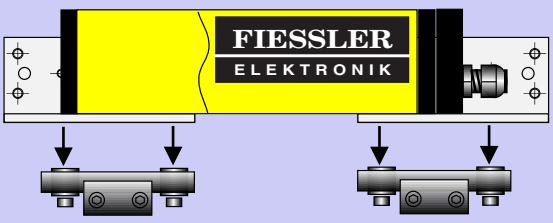
Set the dip-switches in the ULVT receiver head as shown above

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

DIN EN ISO 9001
Reg.Nr. 96007

CE

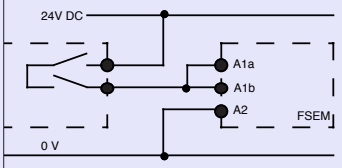
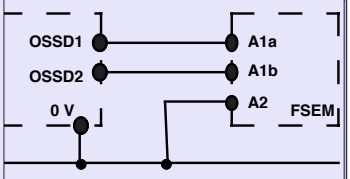
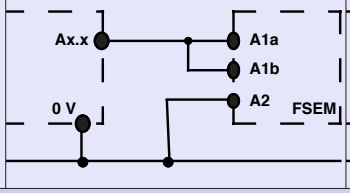
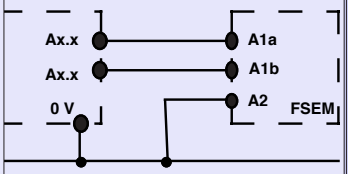
Fiessler Elektronik Kastellstr. 9
D - 73734 Esslingen

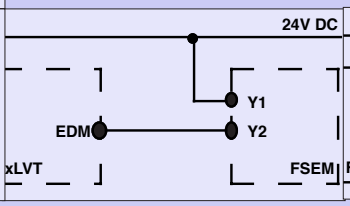
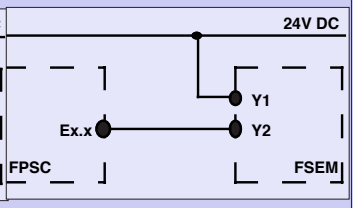
Telefon: +49 (0) 711 / 91 96 97-0 Internet: http://www.fiessler.de
Telefax: +49 (0) 711 / 91 96 97-50 eMail: info@fiessler.de

Application

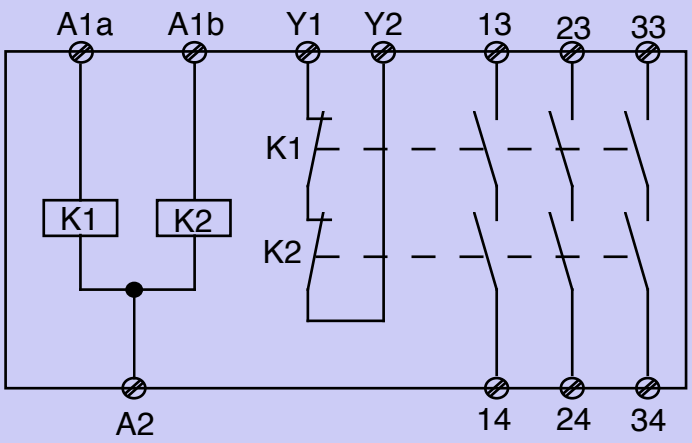
The safe expander module FSEM expands an existing circuit. As the output relays are monitored with the base unit feedback loop, it is possible to reach the same safety level to the contact expander module. Base units can be all safety devices with a monitored feedback loop. Fiessler Elektronik offers 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

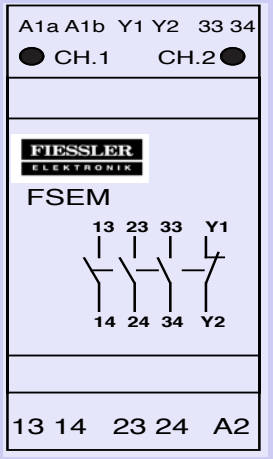
Input circuit	Single channel	Dual channel
Base unit: Safety relay		
Base unit: Safety light curtains series ULVT, BLVT, ULCT and BLCT		
Base unit: Programmable safety controller FPSC		

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:

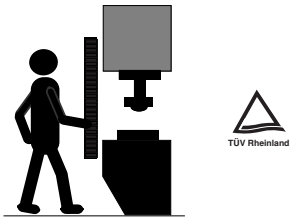
Contact material	AgC2O
Airgap creepage	DIN VDE 0110-1
connection/wiring	pluggable screw terminals min. 0,5qmm, max. 2,5 qmm.
Dimensions (without connectors)	H: 85,5 mm W: 35 mm D: 58 mm
Installation	Top hat rail mounting (DIN rail 35mm)
Weight (without connectors)	110 g
Ambient temperature	0° C ... 60°C
Switching Cycle life time	>50 x 106

Order reference

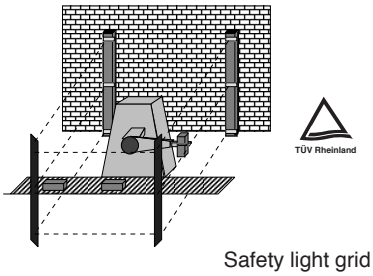
FSEM-C3-S	**with screw terminals**
FSEM-C3-F	with cage clamp terminals

Delivery program

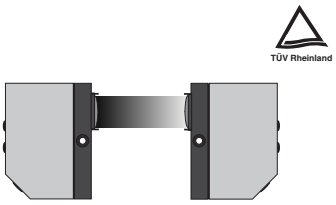
Fiessler Elektronik
Kastellstr. 9 D-73734 Esslingen
Telefon: 0711 / 91 96 97-0
Telefax: 0711 / 91 96 97-50
WWW.fiessler.de
E-Mail:info@fiessler.de



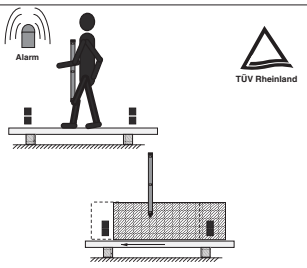
Safety light curtain



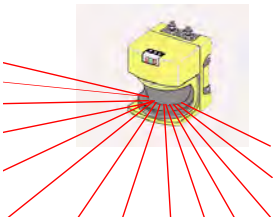
Safety light grid



Single safety light beam

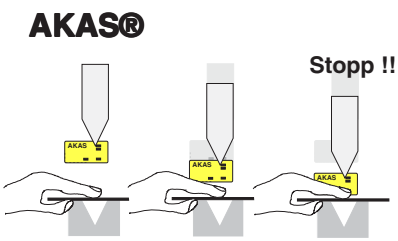


Saftey light grid with muting function



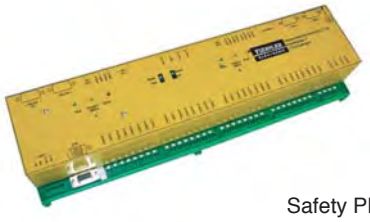
Proximity scanner

Safety mats

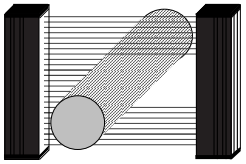


Press brake safety system

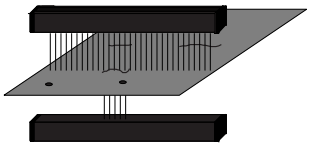
Safety foot pedal



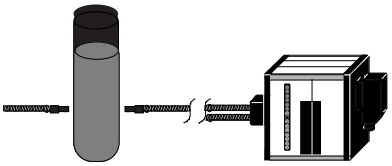
Safety PLC
Safety controllers



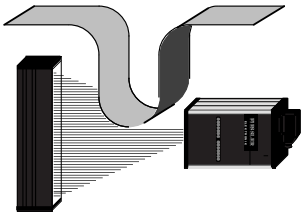
Measuring and controlling light curtains



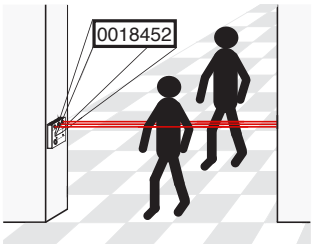
Hole detectors



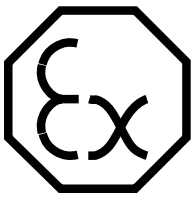
Turbidity sensors

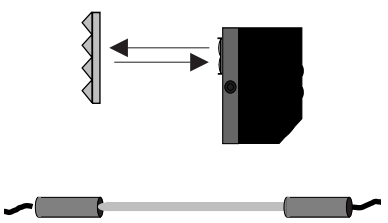


Analogue loop sensors



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

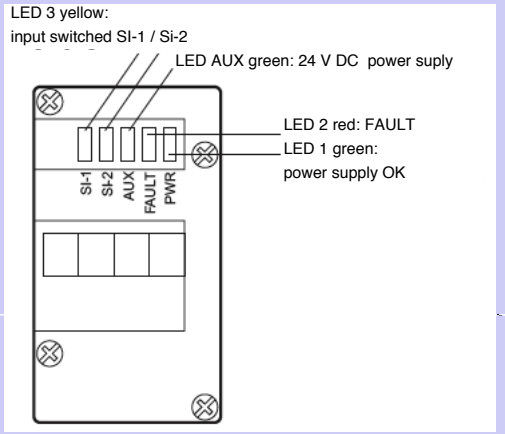
Typ 4 EN 61496
PL e ISO 13849
SIL 3 EN 61508
Kat. 4 ISO 13849

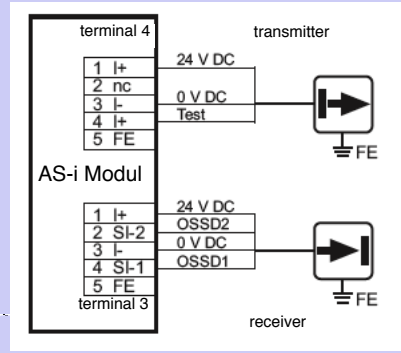
DIN EN ISO 9001
Reg.Nr. 96007

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

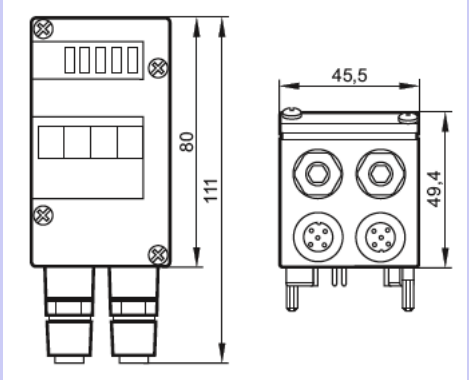
AS-i Module

area scanner

terminal 3

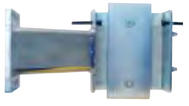
Technical data

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

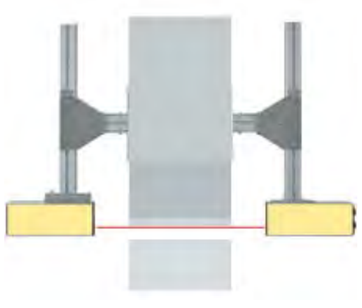
Adaptor for swivable holder

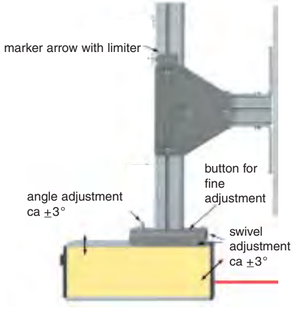


U-Holder for lateral mounting

Adjustment screws provide easy adjusting

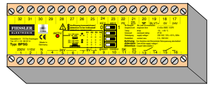
Additional equipment for AKAS®LC





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

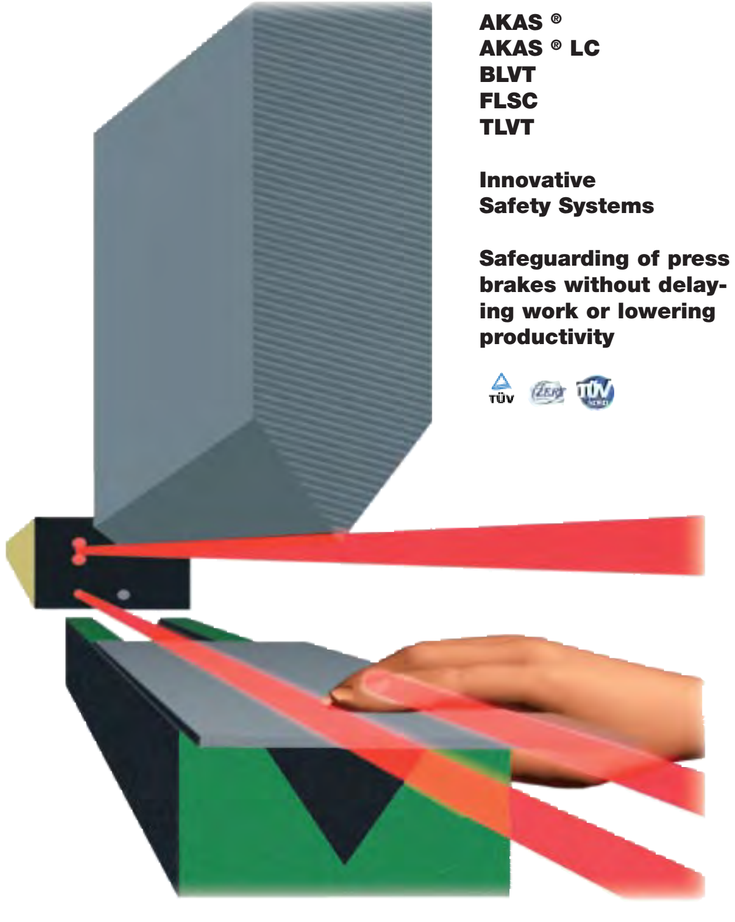
BPLG Programmer with power supply

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



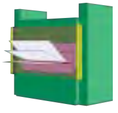
AKAS ®
AKAS ® LC
BLVT
FLSC
TLVT

Innovative Safety Systems

Safeguarding of press brakes without delaying work or lowering productivity

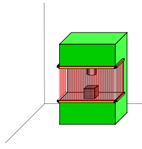
Product Program

Safety Light Curtains

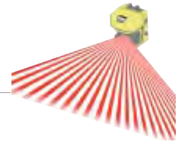


Blanking

Pressure Sensitive Safety Footmats



Cascadable Light Curtains



Safety Area Laser Scanner

Fiessler Elektronik OHG Kastellstr. 9 DE-73734 Esslingen

Phone: ++49-711-91 96 97 - 0 central office
- 11 Orders processing international
- 13 Sales
- 14 Sales International
- 15 Purchase
- 20 Application Advice
- 50 Telefax

Internet: www.fiessler.de
eMail: info@fiessler.de

Regional sales offices:

Northern Germany Mobile: 0172- 71 99 854
Western Germany: 0172- 71 99 851
Southern Germany Mobile: 0172- 71 99 852
Bavaria: 0171- 20 55 470

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.

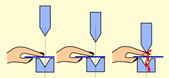
The company Fiessler Elektronik is managed now by the second generation. A team of 40 highly qualified emplyees as well as a rather broad scale of products are the basis for innovative outputs in the field of safety technology and customer-specific optosensorics.

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:

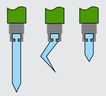


Bending of sheet metal of small or medium handling geometry:

flat-iron sections

box-shaped parts

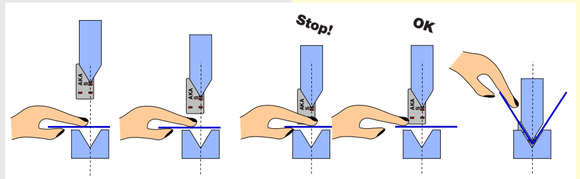
using tools of <u>different</u> tool hights



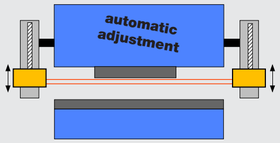
Solution:

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.

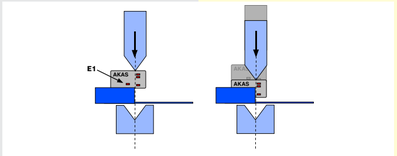
Function:



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

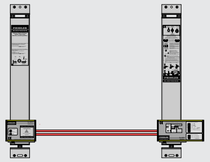


tool change-over
The motor-driven transmitter and receiver are each mounted on supports. Their current position is detected by an optical synchronization, therefore providing a quickautomated adjustment after each tool change-over.



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)

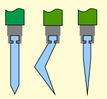
AKAS® LC

Bending of sheet metal of small or medium handling geometry:

flat-iron sections

box-shaped parts

using tools of <u>equal</u> 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

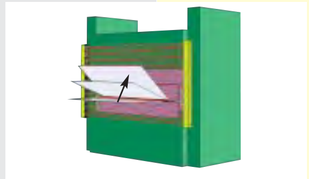
Bending of sheet metal of small or medium handling geometry:

flat-iron sectios

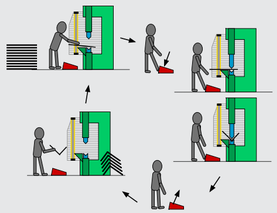
no box-shaped parts

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.

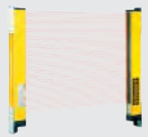


Workpiece is blanked



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.

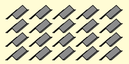
Light curtain + Cycle control

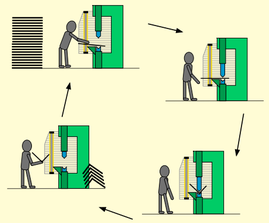
Bending of workpieces of small or medium handling geometry:

flat-iron sections

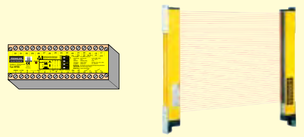
no box-shaped parts

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.

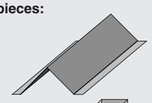


B800/104, Safety-light curtain class 4 with Blanking features. Minimum resolution 14mm.
NSR3-1K, programmable Safety controller module LSUW NSR3-1 K

Area Laser Scanner

Bending of large Workpieces:

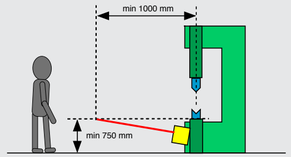
large flat-iron sections



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.

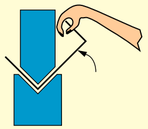


Protection by distance regulation

FLSC Safety Area Laser Scanner

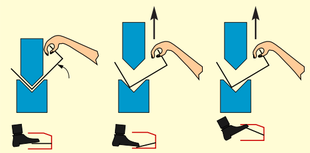
Safety Foot Pedal

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.



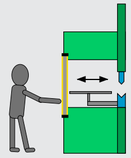
Pos 1 **Pos 2** **Pos 3**

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.

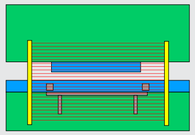
FL1-528/ZSD4
Single safety foot pedal
FL1-528/ZSD4-U
Twin safety foot pedal

Light Curtain Class 2

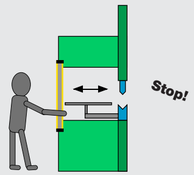
Safeguarding of the interior of the press brake from the rear end of the press:



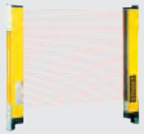
The transmitter and receiver of the safety light curtain TLVT generate a protective field that safeguards the back of a pressbrake.



Safeguarding of a press brake at its back opening

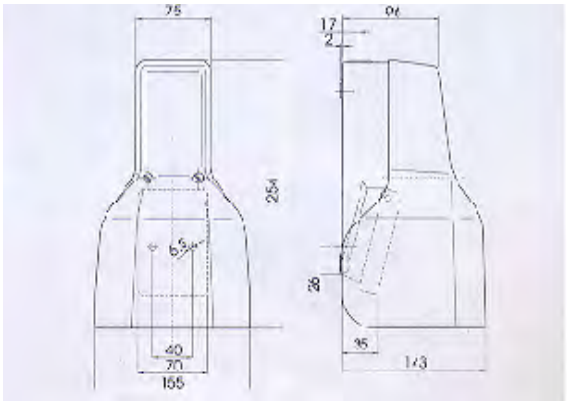


If the operator reaches through the protective field into the opening, the rear drive shafts will come to an immediate stop.



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

Safety foot pedal
FL1-528-ZSD4-U



The safety foot pedal FL1-528-ZSD4-U has 3 positions, with a hard point, to control dangerous movements (for instance the closing movement of a press brake etc…). It has 4 working contacts (2NC+2NO) to drive the movement and a block of 2 safety switches (1 positively driven NC contact + 1NO) to stop the movement. Pressing on the right foot actuator, till the hard point, allows the changeover of the 4 working contacts. Once the hard point is passed, the 4 working contacts return to their first position and the 2 contacts block is activated in order to stop immediately the dangerous movement. Then it would be possible to drive one more time the movement after the foot actuator is completely released. This function allows to stop immediately the machine even if the operator is carried along in front by the dangerous movement.

Technical Data

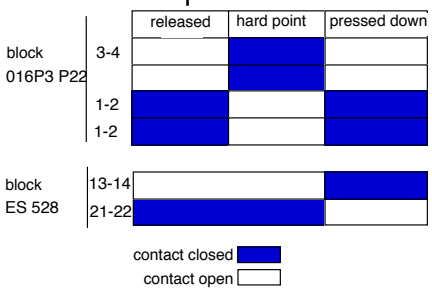
Mechanical data

Housing:	Die cast aluminium AL Si 12 – paint colour grey like RAL 7001
Cover/protective hood:	Die cast Aluminium AL Si 12 - paint colour red like RAL 3000
Foot actuator:	Reinforced thermoplastic PA 6.6 – black
Service temperature:	-30°C à +70°C
Mechanical service life :	106 operations min
Cable entry :	PG13,5 (It is recommended to fix the cable with one cable gland)

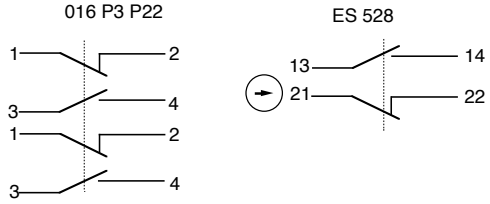
Electrical data

	Before hard point	After hard point
Contacts:	2 NO + 2 NC	1 NO + 1 positively driven NC
Switching element:	Snap-action switch	Slow-action switch
Connection type:	solder post	screw terminal
Operating voltage:	max. 250 V~	max. 250 V~
Switching current:	max. 5 A	220V/0,5A 24V/6A

Switching diagram

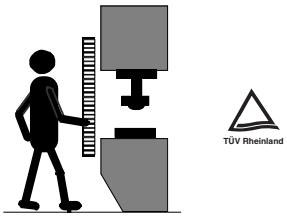


Wiring diagram

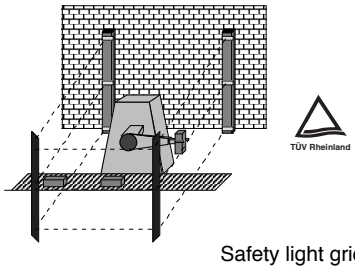


Delivery program

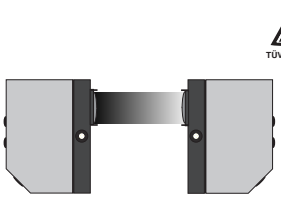
Fiessler Elektronik
Kastellstr. 9 D-73734 Esslingen
Telefon: 0711 / 91 96 97-0
Telefax: 0711 / 91 96 97-50
WWW.fiessler.de
E-Mail:info@fiessler.de



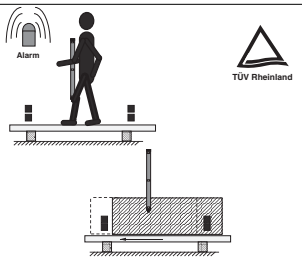
Safety light curtain



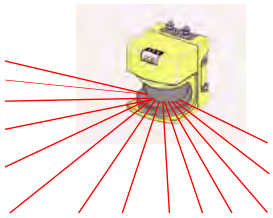
Safety light grid



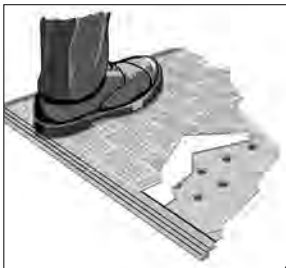
Single safety light beam



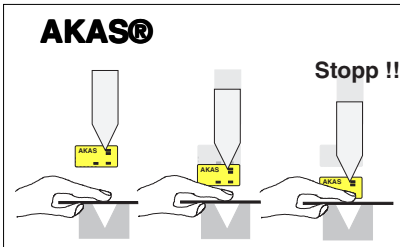
Saftey light grid with muting function



Proximity scanner



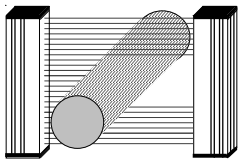
Safety mats



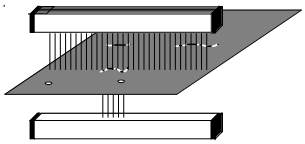
Press brake safety system

Safety foot pedal

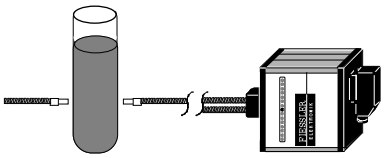
Safety PLC
Safety controllers



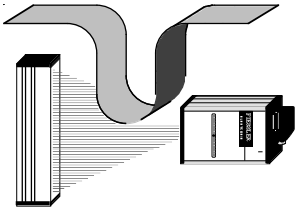
Measuring and controlling light curtains



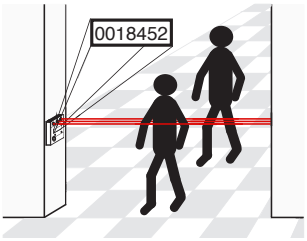
Hole detectors



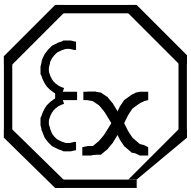
Turbidity sensors

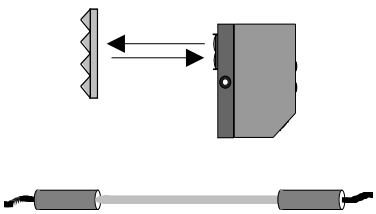


Analogue loop sensors



Counting light barriers





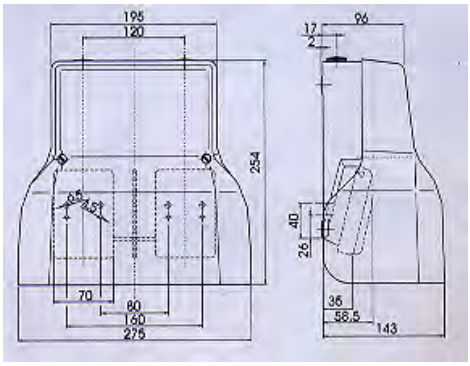
Light barriers for general purposes

Your application

FIESSLER ELEKTRONIK

Data sheet

Safety foot pedal
FL2-528-ZSD4-U



The pedal FS2-528-ZSD4-U uses safety switches. The left foot actuator has two positions (free position and pressed down position), it can be used, for example, to stop the dangerous movement (for instance upward (=opening) movement) of a press brake tool etc…). The right foot actuator has 3 positions, with a hard point, to control dangerous movements (for instance downward (=closing) movement) of a press brake tool etc…)

It has 4 working contacts (2NC+2NO) to control the movement and a block of 2 safety switches (1 positively driven NC contact + 1NO) to stop the movement. Pressing on the right foot actuator, till the hard point, allows the changeover of the 4 working contacts. Once the hard point is passed, the 4 working contacts return to their first position and the 2 contacts block is activated in order to stop immediately the dangerous movement. Then it would be possible to drive one more time the movement after the right foot actuator is completely released.

his function allows to stop immediately the machine even if the operator is carried along in front by the dangerous movement.

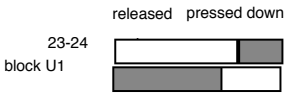
Housing:	Die cast aluminium AL Si 12 – paint colour grey like RAL 7001
Cover/protective hood:	Die cast Aluminium AL Si 12 - paint colour red like RAL 3000
Foot actuator:	Reinforced thermoplastic PA 6.6 – black
Service temperature:	-30°C à +70°C
Mechanical service life :	106 operations min
Cable entry :	PG13,5 (It is recommended to fix the cable with one cable gland)

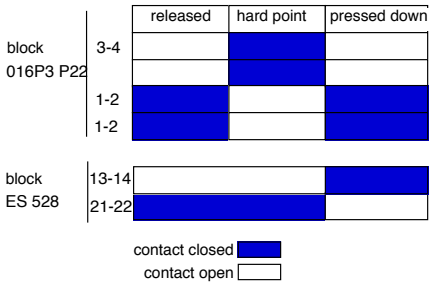
Technical Data

Mechanical data

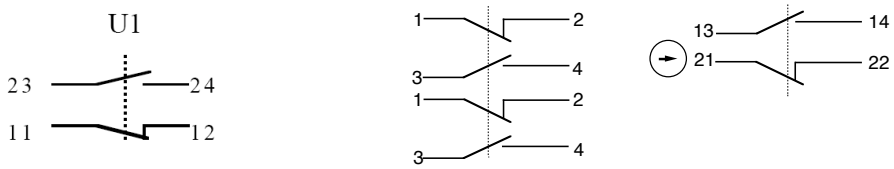
	Left foot pedal	Right foot pedal	
		Before hard point	After hard point
Contacts:	1NO + 1NC	2 NO + 2 NC	1 NO + 1 positively driven NC
Switching element:	Slow-action switch	Snap-action switch	Slow-action switch
Connection type:	screw terminal	solder post	screw terminal
Operating voltage:	max 500V ~ 40-60 Hz	max. 250 V~	max. 250 V~
Switching current:	max 10A	max. 5 A	220V/0,5A 24V/6A

Electrical data





Switching diagram



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

Delivery program

Fiessler Elektronik
Kastellstr. 9 D-73734 Esslingen
Telefon: 0711 / 91 96 97-0
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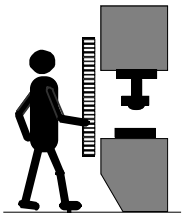
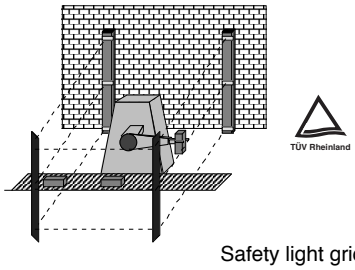
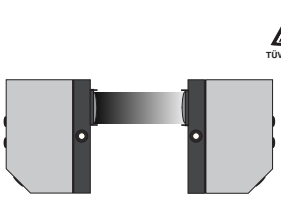


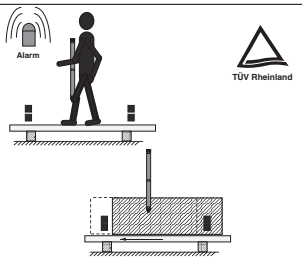
Safety light curtain



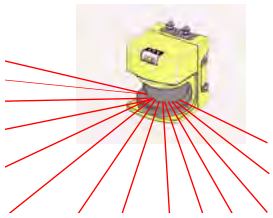
Safety light grid



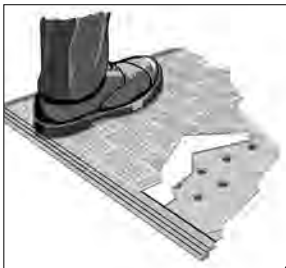
Single safety light beam



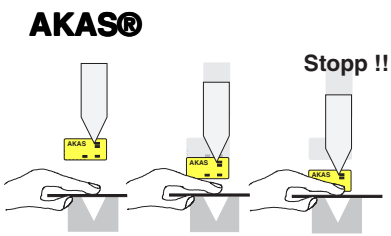
Saftey light grid with muting function



Proximity scanner



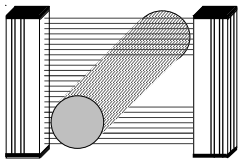
Safety mats



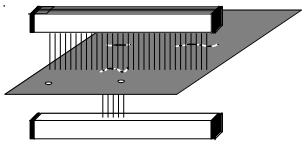
Press brake safety system

Safety foot pedal

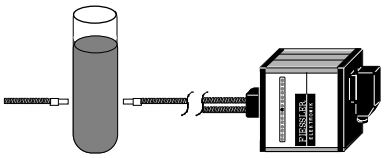
Safety PLC
Safety controllers



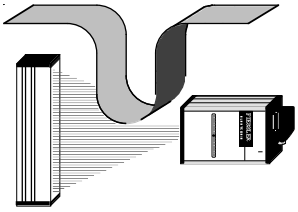
Measuring and controlling light curtains



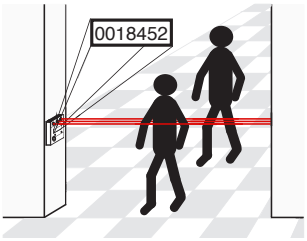
Hole detectors



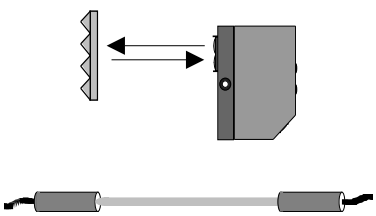
Turbidity



Analogue loop sensors



Counting light barriers



Light barriers for general purposes

Your application

Class 3 proximity laser scanner FLSC

proximity laser scanner with 190° scanning angle

status display by signal lamp and 7-segment display

integrated programmable restart interlock and restart interlock delay

configuration memory integrated in connector

optional

reliable personal recognition and protection up to 4 m, option: 7m

Integrated contactor control (EDM)

contour mensuration control

TÜV

ZERT DIN EN ISO 9001 Reg.Nr. 96007

Typ 3 EN 61496 · PL d ISO 13849 · SIL 2 EN 61508 · Kat. 3 ISO 13849

Doku Nr.1283 Stand 27.4.2011 / Aui/DI

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

FIESSLER ELEKTRONIK

Class 3 proximity laser scanner FLSC

Characteristics:

- **safety class 3 SIL 2**
  Performance Level PL d
- integrated contactor control (EDM)
- 190° scanning angle
- status displayed by signal lamp and 7-segment display
- personal recognition up to 4 m, optional 7 m radius
- warning field: 49 m radius, detection is subject to re-emission!
- contour recognition of the protective field
- minimum response time 60 ms
- configuration via PC or Notebook
- configuration memory integrated in system connector
- enhanced indifference to external light sources and resistance to dust

Areas of application:

- **accessible hazardous machine areas**
- **accessible areas inside of machines**
- **moveable ground transportation vehicles**
- **barring from walking behind the hazardous site**
- **barring from entering the hazardous site**

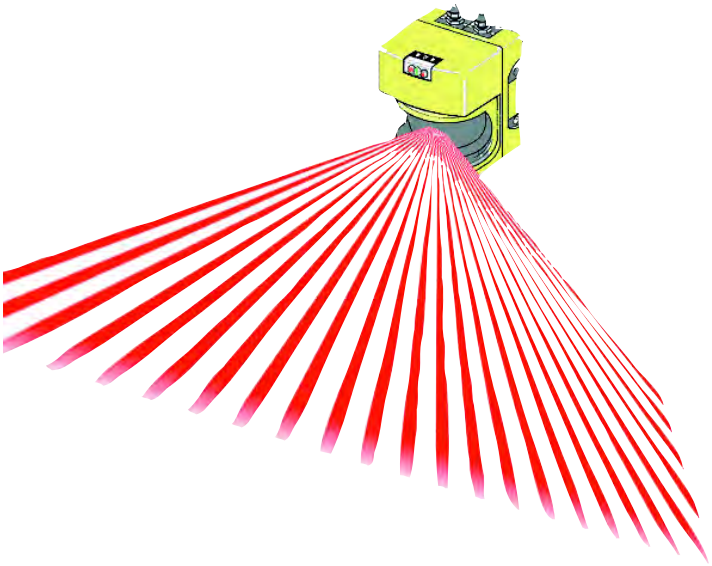
Function principle:

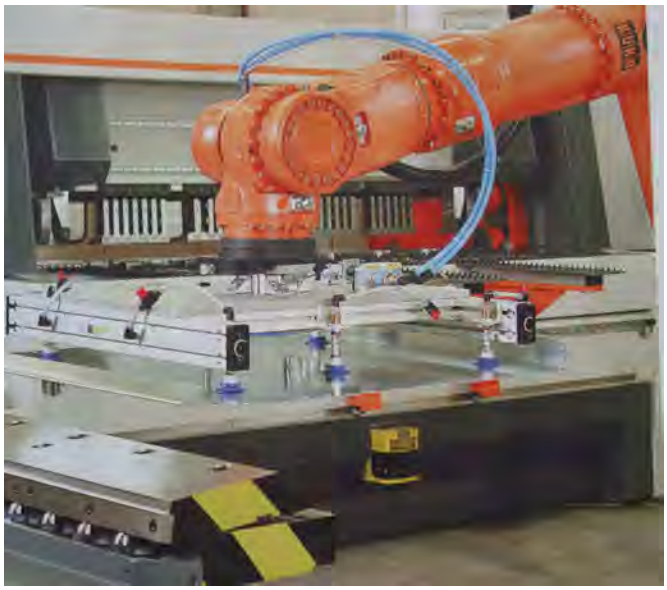
The Proximity Laser Scanner FLSC is a scanning distance sensor.
Persons and objects within a pre-defined protection field are reliably detected.

Via a rotating deflection mirror, the FLSC emits a bundle of Laser beams. By this, a circle-shaped area covering an opening angle of 190 ° and a radious of approx. 49 m is scanned. The semicircular area is divided into two detection sectors: Personal protective field: Range (radius) up to 4 m, optional up to 7 m.

Warning field: Range (radius) up to 49 m. In every detection sector, a protective field can be programmed.
The shape of this protective field may be chosen or programmed at random.
The FLSC scanner comes with a communication software which enables the programming of the contour of the protective field by a PC.

The coordinates of the protective fields are stored in the built-in memory of the connector of the FLSC proximity Laser scanner.
The FLSC Scanner evaluates the obtained measurement data with those of the already stored protective fields and verifies the presence of an object in the protective field.
If the scanner beam detects the presence of an obstacle (an object or a person) within the work zone, the beam will be reflected by this obstacle. Part of the reflected, diffuse beam bundle is recognized and evaluated by the FLSC receiver eye.





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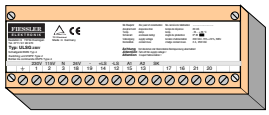
Telefax: +49 (0) 711 / 91 96 97-50 eMail: info@fiessler.de

Characteristics	FLSC
safety class type	class 3 (cat. 3) according to IEC/EN 61496, PL d according to (ISO 13849-1), SIL 2 (IEC/EN 61 508)
number of fielt sets: (protection & warning)	1
resolution	30, 40, 50, 700, and 150mm
detection range	personal protection: max.: 4m (optional 7 m), warning field max. 49 m
response time	minimum 60 ms
Mechanical data	
mounting kits	- With the **mounting kit # 1 ,** you can mount the FLSC indirectly on the mounting surface of the location where the scanner is to be installed. This is necessary if you cannot drill through the mounting surface from the rear. - With the **mounting kit # 2** (add-on kit, only in connection with mounting kit no. 1) the FLSC can be adjusted in 2 plane surfaces. Maximum adjustment angle here wil be ±11° for both planes. - With the **mounting kit # 3** (add-on kit, only in connection with mounting kits no. 1 and no. 2) the FLSC can be mounted in a way that the scan plane is parallel to the mounting surface. By this, a stable floor installation of the item is realised, or, e.g. in the case of uneven wall surfaces, the lateral axis of the mounting kit no. 2 will remain randomly adjustable.
connection	screwed system connector, cable glands by PG- screw fitting.
front window	- material: poly carbonate - outside: : scratch-resitant coating
housing	- material: die-cast aluminium - color: RAL 1021 (rape yellow)
weight	3300g
Operational Data	
enclosure rating	IP 65
Laser protection class	Laser class 1 (21 CFR 1040.10 and 1040.11, DIN EN 60 825:2001)
ambient temperature	-10 to 50 °C
protection class	II
Scanning angle	190°
Electrical Data	
power supply	16.8-28.8 V DC
Inputs	1x Reset // 1x EDM contactor control
outputs	1x object within the warning field // 1x reset rquired // 1x error/soiling
safe outputs	2 self-monitoring OSSDs

Doku Nr.1283 Stand 27.4.2011 / Aui/DI

Accessories and Spare Parts	order code
Proximity area Scanner FLSC-S3S, software included, safety category 3 according to EN 954 detecting range 4 m, 1 protective field, including system connector and 2m programming cable	FLSC-S3S/4m/Kab
Proximity area Scanner FLSC-S3S, software included, safety category 3 according to EN 954 detecting range 4 m, 1 protective field, system connector and 2m progr. cable not included	FLSC-S3S/4M
Proximity area Scanner FLSC-S3S, software included, safety category 3 according to EN 954 detecting range 7 m, 4 protective fields, including system connector and 2m programming cable	FLSC-S3S/7M/KAB
Proximity area Scanner FLSC-S3S, software included, safety category 3 according to EN 954 detecting range 7 m, 4 protective fields, system connector and 2m progr. cable not included	FLSC-S3S/7m
Mounting kit # 1 for proximity area scanner FLSC-S3S2	FLSC-BS1
Mounting kit # 2 for proximity area scanner FLSC-S3S2	FLSC-BS2
Mounting kit # 3 for proximity area scanner FLSC-S3S2	FLSC-BS3
Programming cable for FLSC-S3S2S, SUB-D on round plug, 2m	FLSC-3S/KAB
Power supply ULSG for ULVT/TLVT, FLSC for voltages 115/230V AC, & 24 V DC, potential-free outputs 	ULSG
Modification of Proximity area Scanner FLSC-S3S for operation in EX-zones (EEx-p)	EEXVOR/FLSC
System connector for FLSC-S3S2	FLSC-S3/ST
Spare front pane for Scanner FLSC-S3S2	FLSC-ES
Covering hood for Scanner FLSC-S3S2	FLSC-AH

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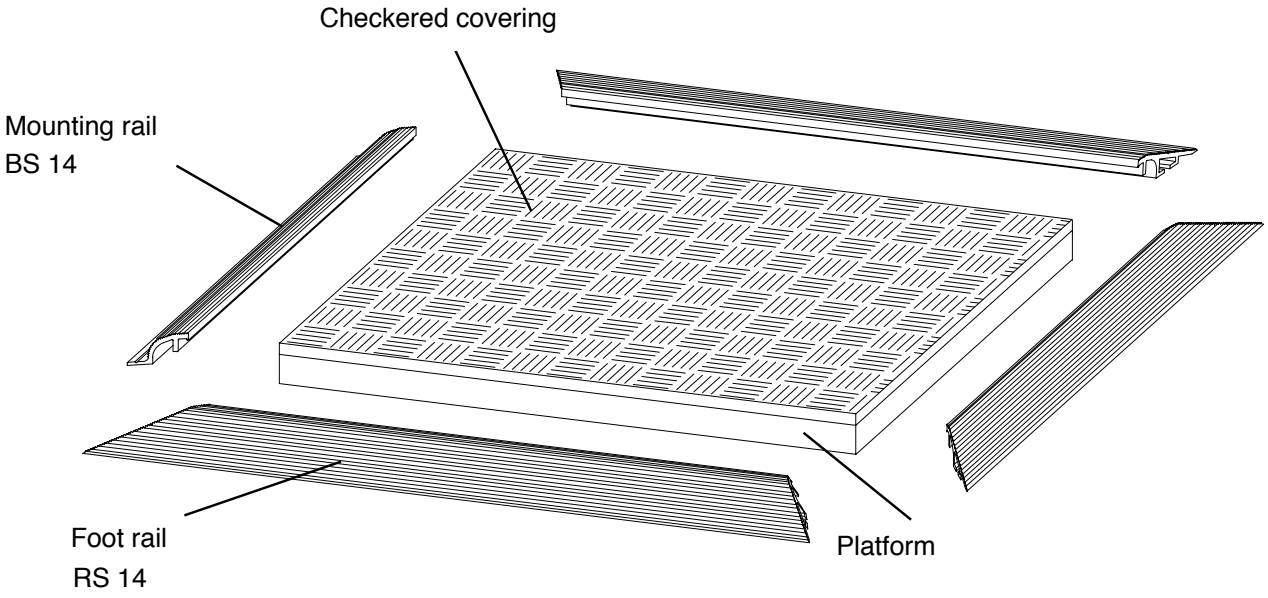
Safety contact mat STM



The safety contact-mat STM is used for safeguarding sections in hazardous areas of working for machinery, e.g. presses, robots and other types of swiveling equipment. Walking on the mat triggers a control signal to the immediate- stop device of the potentially hazardous motion. This quick-action contact-making is made possible by surface-area switch on the inside of the mat that is encased in polyurethane to ensure impermeability to water. A platform made of plastic or metal serves as the carrier. The surface can be protected by adhesion-bonding an anti-slip rubber covering to thereby give high grip to the surface. Checkered surfaces in aluminum or high-grade steel can be used for high mechanical demands placed on the upper mat surface. Special evaluation units monitor the switching function of the reliable safety contact-making mats.

TÜV

Safety category Type 3

DIN EN ISO 9001
Reg.Nr. 96007

Individual sizes available

Typ 3 EN 61496 / PL d ISO 13849 / SIL 2 EN 61508 / Kat. 3 ISO 13849

Up to 10 mats in series connectable

optional

Very short response time - Static load up to 2000 N

Rubber,- Aluminium- or Stainless steel surfaces available

Fiessler Elektronik Kastellstr. 9
D - 73734 Esslingen

Telefon: +49 (0) 711 / 91 96 97-0 Internet: http://www.fiessler.de
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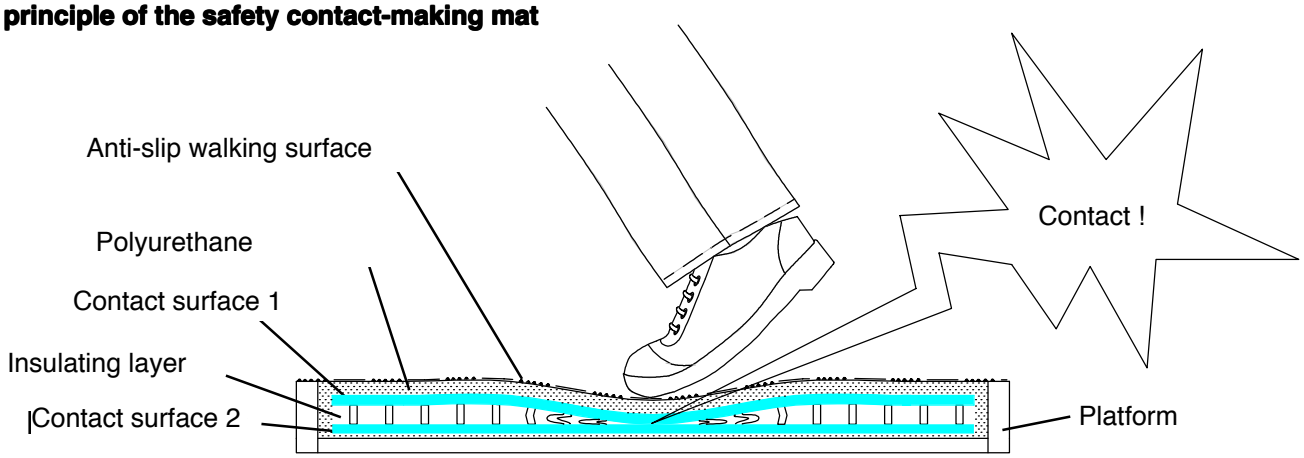
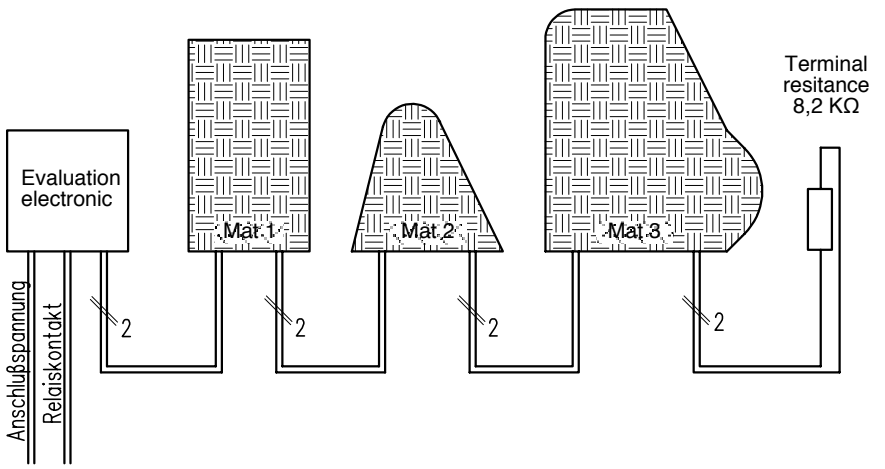
The principle of the safety contact-making mat



The structure

The basic design of the STM safety contact mat is a platform made of PVC, aluminum or stainless steel that provides good protection against a wet underground. A surface-area switch is installed in this platform in a sandwich-type construction and includes two two-core cable connections to the outside. The switch consists of two conductive plates that are separated from each other by a perforated insulating layer. This structure is encased in polyurethane for permanent protection against moisture. Special anti-slip coverings made of rubber or metal can be added at the factory for mats for the walking surface, as well as for specific environmental conditions such as oils, acids and lye's. Fixation to the floor is by means of special foot rails or by using a mounting rail made of aluminum. A mounting frame can be supplied for laying flush with the floor.



Observe under all circumstances:

- Up to 10 contact-making mats wired in series may be connected to one evaluation unit. The maximum total area shall thereby not exceed 10 m2!
- The total conductor routing shall not exceed 75 m.
- The 8.2 KΩ terminal resistance must be connected to the last mat when several mats are connected in series!
- Please inquire separately for mats with recesses or special shapes.

Signal processing

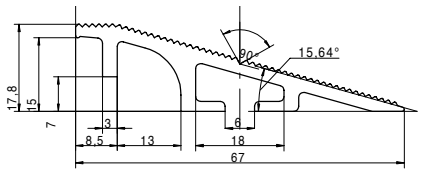
The STM safety contact-making mat is fitted with two two-core connecting cables and offers the possibility of connecting several mats in series up to a maximum total area of 10 m2. One end of the cable is connected to the evaluation electronics and the terminal resistance is connected to the other end (prepared accordingly at the factory). The electronics now monitor the entire conductor route, including the mats, through to the terminal resistance. The contact-making surfaces make contact in the event of external forces acting on the mat and the resistance is bridged. This immediately causes a signal within the electronics that is then given as a potential-free output for contact-making by the relay. The entire switching arrangement is monitored at the same time for cable rupture or manipulation.

Technical specifications for safety contact mats

Max. dimensions:	2500 mm x 1400 mm
Standard dimensions:	1000 mm x 750 mm
	1000 mm x 1000 mm
	1000 mm x 1500 mm
Construction height:	10 mm without covering
	14,5 mm with covering
Weight:	approx. 15 kg/m² (without covering)
Inactive border:	max. 10 mm on all sides
Switching pressure:	Round body 80 mm ∅ = approx. 150 N
Static load:	max. 2000 N over 80 mm ∅ *
Response time:	max. 25 ms * *** Tested according to EN 1760-1**
Switching cycles:	mind. 1,5 Mio.*
Material:	Polyurethane, yellow
Protection class:	IP 65
Temperature range:	0 °C bis + 60 °C
Chem. resistance:	Oils, greases - good
	10 % acid - resistant
	10 % lye - resistant
Maintenance:	The mat is maintenance-free.
	Functional testing on an annual basis is recommended
Connecting cable:	Standard: Non-pluggable, 2 x 0,34 PU-Cover black
	Also available in versions with M8 plug-in connections

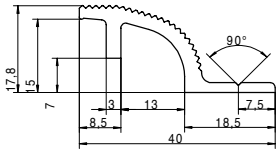
Technical spezification foot rail RS 14

Material:	Aluminium AlMgSi 0,5
Standard Delivery lengths:	2 m / 6m
Weights:	approx. 788 g/ per m



Technical spezification mounting rail BS 14

Material:	Aluminium AlMgSi 0,5
Standard Delivery lengths:	2 m / 6m
Weights:	approx. 408 g/ per m



Delivery program

Fiessler Elektronik
Kastellstr. 9 D-73734 Esslingen
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WWW.fiessler.de
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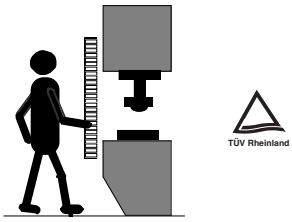
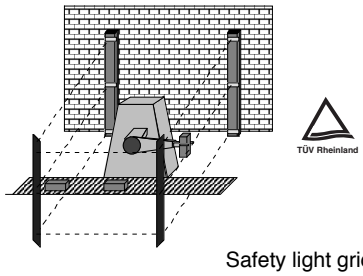
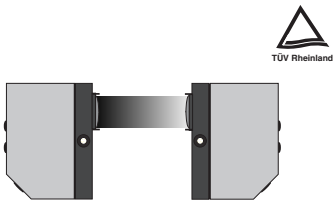


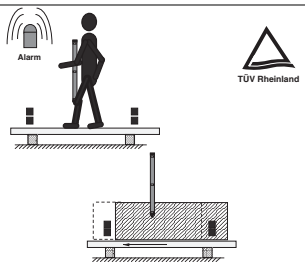
Safety light curtain



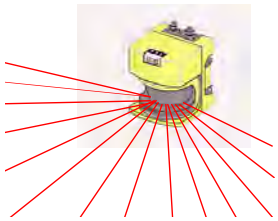
Safety light grid



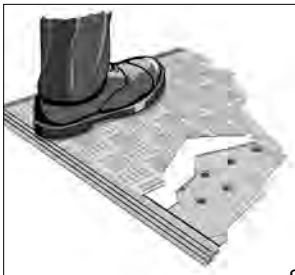
Single safety light beam



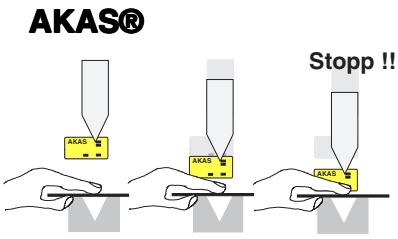
Saftey light grid with muting function



Proximity scanner

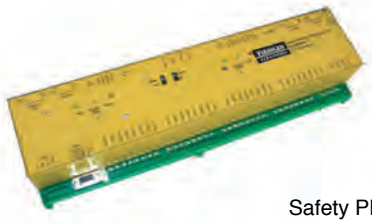


Safety mats

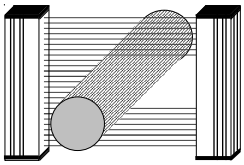


Press brake safety system

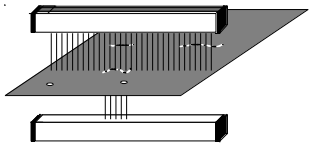
Safety foot pedal



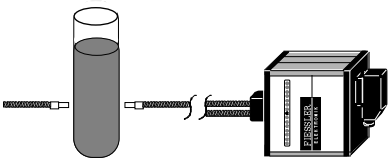
Safety PLC
Safety controllers



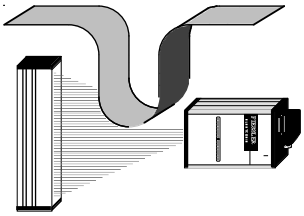
Measuring and controlling light curtains



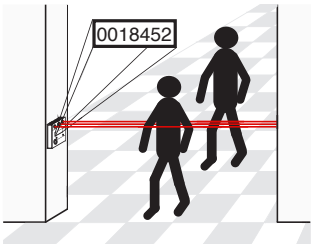
Hole detectors



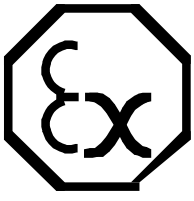
Turbidity sensors

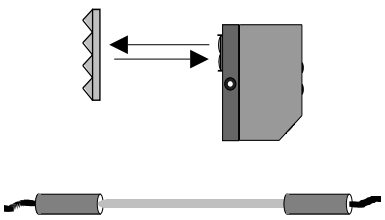


Analogue loop sensors



Counting light barriers





Light barriers for general purposes

Your application

FIESSLER ELEKTRONIK

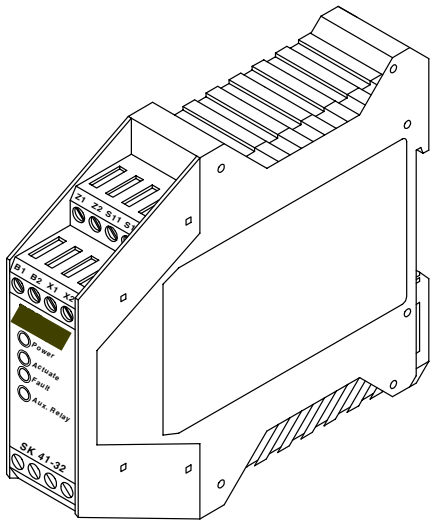
Data sheet

Control box STM STK 41-32 for safety mats STM

The single-channel SK 41-32 switchgear finds application in the evaluation of safety contact mats as well as in providing security of pinch and shear points caused by safety contact edges and safety bumpers.
The switchgear is designed in accordance with EN 954-1 for Category 3. In order to meet Category 3 requirements, the switchgear has been designed to be redundant, diversified, and equipped with two safety relays which query each other and are force guided. In order to permit the quiescent current of the circuit element to be monitored, a terminal resistor has been integrated in the signal transmitter. When the desired quiescent current is flowing, the output relay is activated and the switching contact is closed. If the signal transmitter is activated or the safety circuit is interrupted, the relay switching contact opens. The switch states of the relays and the applied circuit voltage are indicated by LEDs.

Signal Indicators

Green LED	Power
Yellow LED	Actuate
	edge activated
Red LED	Fault
	safety circuit interrupted
Orange LED	Aux. Relay



Connection terminals

X1,X2	Connection signal transmitter
13,14	Contact, safety relay 1
23,24	Contact, safety relay 2
	Relay contacts are switched in series
	via the wire bridge between 14-23.
31-32	Contact auxiliary relay
Z1-Z2	Manual reset connection
S11-S12	Encoder input, reset
A1-A2	Supply voltage 230V 50/60Hz
B1-B2	Supply voltage 24V AC/DC

Important Safety Information

- Only specially trained personnel familiar with these operating instructions and the applicable regulations governing work safety and accident prevention may install and commission the switchgear.
- Before performing any work on the switchgear it must be disconnected from the power supply and its lack of power must be checked.
- All safety regulations applicable to electrotechnology and mandated by the professional association are to be observed.

Proper Use

The SK 41-32 safety switchgear is intended for use in safety circuits for safety contact mats, safety bumpers, and safety contact edges.

Note

- The switchgear permits operation with 230 V or with 24 V. Connecting the circuit voltage to the wrong terminals will destroy the switchgear.
- The recording contact 33, 34 serves merely as an auxiliary contact (display, etc.) and may not be included in the safety circuit.
- The switchgear is to be installed in a circuit cabinet.
- Do not install it near strong heat sources.
- The switchgear contains no user-serviceable parts. Opening the housing or performing any modifications will result in the warranty being voided.

Operating Modes

- The safety circuits can be output separately or switched in series.
- Automatic reset (factory presetting, S11/S12 unbridged): After the signal transmitter has been activated/has failed, or after a power failure, the switchgear automatically releases the safety circuit.
- Manual reset (S11/S12 bridged): After the signal transmitter has been activated/has failed, or after a power failure, the switchgear only releases the safety circuit after the reset button has been pressed. This prevents the equipment from accidentally restarting.

Mounting

The compact and easily installed safety switchgear is designed for installation on a standard 35 mm DIN rail in the circuit cabinet.

Commissioning

- Connect the supply voltage to terminals A1/A2 for 230 V AC or to terminals B1 (+) / B2 (-) for 24 V AC/DC.
- Connect the signal transmitter to terminals X1/X2.
- For manual reset, bridge terminals S11/S12 (factory presetting automatic reset: S11/S12 unbridged) and connect the reset button to terminals Z1/Z2.
- Connect the safety circuit being monitored to terminals 13-24. For redundant continuation of the switching contacts, remove the factory installed bridge between terminals 14-23.

Troubleshooting

The LEDs can be used to localize a fault in the system. When the switchgear has been wired correctly and the supply voltage is switched on, only the green LED1 may go on. If the yellow LED2 and/or red LED3 go on, check the connections on the switchgear or switchgears (if several are connected in series). If the fault does not lie with the connections, check the function of the electronics by attaching an 8.2 k| resistor to the X1/X2 input on the switchgear. If the electronics then operates correctly, you must check the switchgears with an ohmmeter. To do this, the connection between the switchgear and the signal transmitter must be broken and then connected to the ohmmeter. With the signal transmitter not activated, the resistance must be 8.2 k| ±100 |. When the signal transmitter is activated, the resistance may not exceed 500 Ω

Technical Specifications

Supply voltage
Mains voltage: U_{net}: 230 V AC 50/60Hz
Low voltage: U_E: 24V AC/DC ±10%

Power consumption
P_{net}: 3 VA I_{net}: 13 mA
P_E: 1,15 VA I_E: 48 mA

Connection resistor, safety contact edges
R_A 8,2 KΩ
R_{AO} > 11,5 KΩ Upper switching threshold
R_{AU} < 5,5 KΩ Lower switching threshold

Safety class
Cat. 3 in accordance with EN 954-1

Safety relay
max. switching voltage 250 V ~ / 30 V -
max. switching current 5 A ~ / 5 A -
Mechanical service life > 106 activations

Auxiliary relay
max. switching voltage 250 V ~ / 30 V -
max. switching current 2,5 A ~ / 2, 5 A -
Mechanical service life > 10^6 activations

Switching times, safety relay
Reaction time < 30 ms
Release time about. 1s

Switching times, auxiliary relay
Reaction time 0,5 s
Release time 3 s

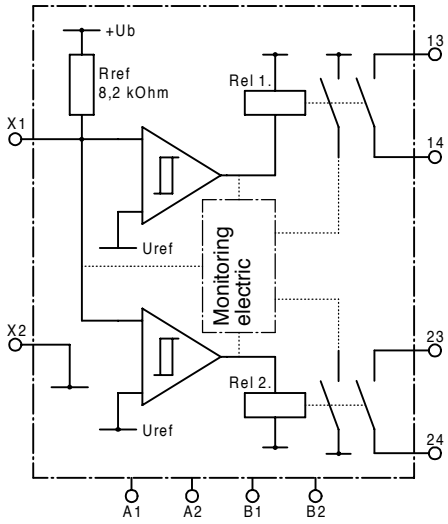
Housing
Polyamide
self-extinguishing, in accordance with UL 94-V2
Dimensions HxWxD 99 x 22,5 x 114 mm

Protection class
IP40 for the housing
IP20 for the terminals

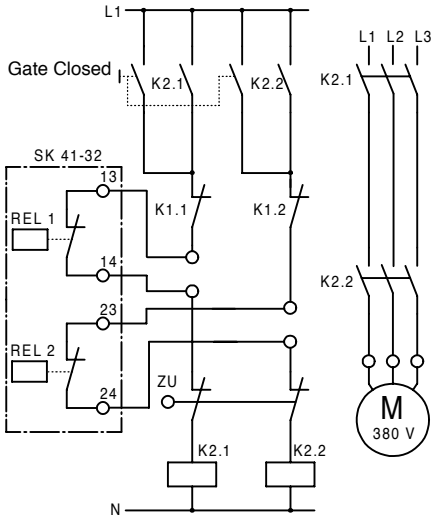
Weight 210 g

Temperature range -25°C bis +55°C

Connecting line cross-sections
0,75-1,5 mm2 Single or fine-strand line



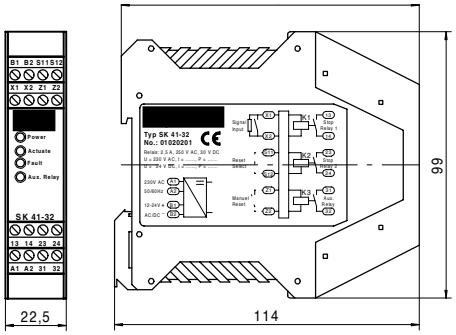
Block terminal diagram SK 41-32



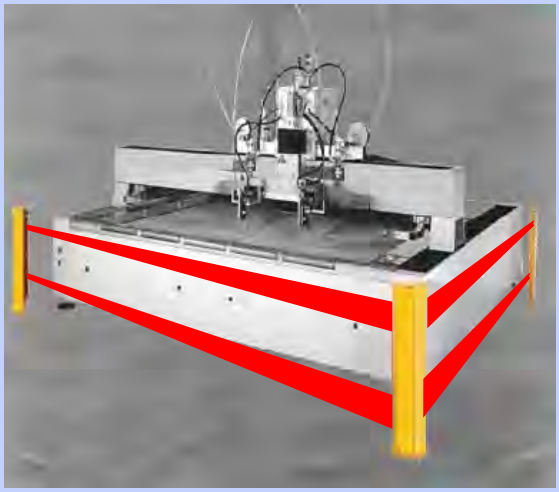
Motor protector 1 & 2

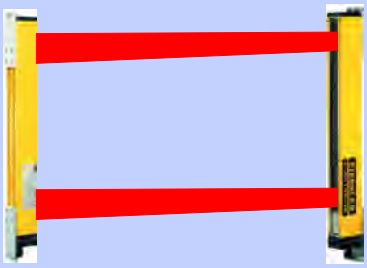
Gate Closed

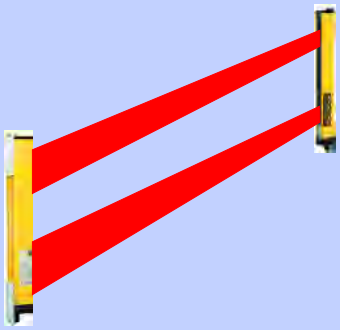
Application example: Closure edge safety with the SK 41-32 switchgear. Shown are the control and primary circuit for the CLOSE movement. The control and primary circuits have redundant design.

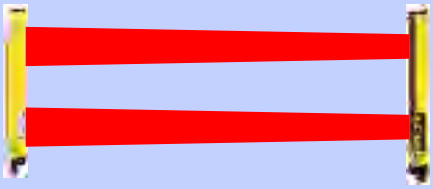


Safety light grid for areas with **heavy dirt accumulation**









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

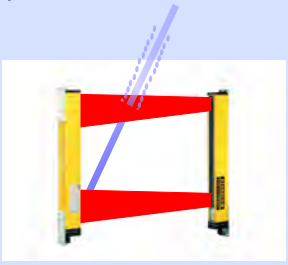
Detection range up to 60 m

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

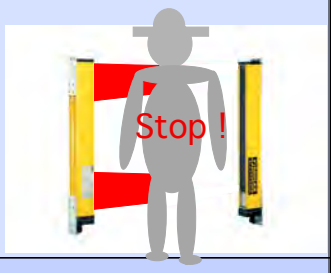
Application

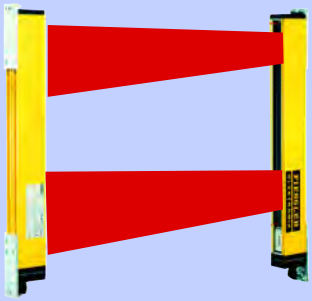
The use of conventional safety light barriers in environments with heavy soiling caused by flying chips, dusts, vapors such as in saw mills, water jet facilities, etc. often turns out to be problematic, as these light barriers shut off as soon as their light beams are interrupted by chips, dusts or steam entering the protective field.



The 2- or 3-beam Fiessler Elektronik safety light grids XLVT-VS protect these special areas in a way that a machine stop is possible only by the interruption of the beams by a person entering the protective field.

The special optics of the safety light grid XLVT-VS ignore the presence of steam, water splashes , waterjets, sawdust, chips, and dusts within the protective field to the greatest possible extent. Only the presence of a large-surface object interrupting the beams will release the safe switching-off of the safety light grid.

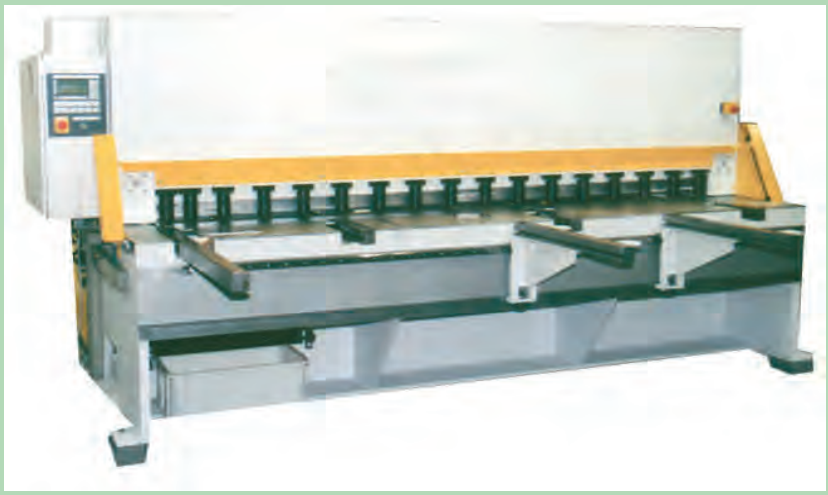


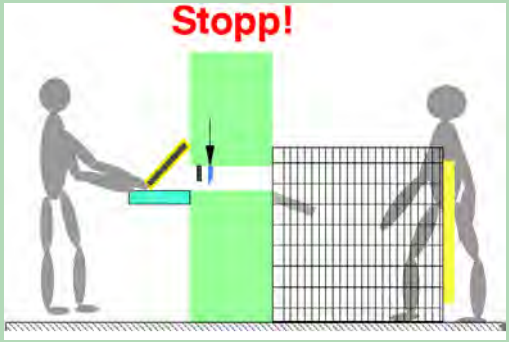


Technical data

ULVT500/2/60	ULVT800/3/60
safety class: 4	safety class: 4, PL e, SIL 3
detection range: 60m	detection range: 60m
number of beams: 2	number of beams: 3
response time: 4ms	response time: 4ms
power supply: 24 VDC +20% -10%	power supply: 24 VDC +20% -10%
integrated adjustment and soil indicator	integrated adjustment and soil indicator
functions: EDM restart interlock	functions: EDM Restart interlock

Safeguards at guillotine shears





Safeguarding at both the inserting and the rear areas of the guillotine

Simple, easy-to-handle installation und adjustment

No mechanical wear and tear

Shorter cycle times = higher productivity

Increase in safety and efficiency of the operator`s working conditions

Simple retrofitting of older machines

Range up to 10 m

TÜV

DIN EN ISO 9001
Reg.Nr. 96007

Typ 4 EN 61496
PLe ISO 13849
SIL 3 EN 61508
Kat. 4 ISO 13849

optional

Fiessler Elektronik Kastellstr. 9
D - 73734 Esslingen

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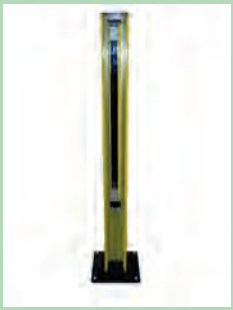
Telefax: +49 (0) 711 / 91 96 97-50 eMail: info@fiessler.de

Application

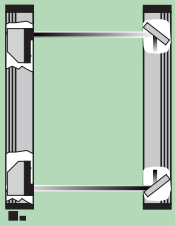


When working with guillotine shears there is a considerably high risk of injuries in both insertion and rear areas of the shears. In the past, the operator's safety depended mainly on mechanical protective devices. At the insertion area, mechanical metal grids as keep-off rails were provided for safety. The safety devices at the back of the shears mainly consisted of safety doors and/or safety metal grids.

However, mechanical safety devices have the disadvantage that they provide little flexibility and interfere with the production process. A better alternative is provided by the optical protective devices manufactured by Fiessler Elektronik, Germany. Adequate solutions for safeguarding both the insertion area (requirement: finger protection) as well as for the rear (requirement: pedestrian protection) are provided, offering considerable advantages in their daily use:

- Safety class 4, PL e, SIL 3
- Reduction of installation costs by simple installation, fast adjustment and easy putting into service.
- Less cable material used at the installation at the rear. There are active components at one end, passive components at the other end of the shear.
- Enhances the availability and reliability by reduction of failure caused by mechanical wear.
- No interference with the production process due to the unlimited accessibility of the fenced-off areas. This enables shorter cycle times and higher productivity, and better acceptance by the machine operators.
- No visual impairment which would occur when using mechanical grids.
- Reduction of storage area and production costs expenditure, as only one optical protective system is needed for safeguarding a machine with a cutting length of 10 m.
- Industrially suitable, sturdy housing which offers resistance to mechanical strain.
- Integrated functions: restart interlock and contactor control.

As an option, the optical light grid is also available preassembled in columns.



Technical data

Front safeguard:

Safety light curtain ULVT 200/26

Safety class: 4

Range: 7m, optional 10m

Response time: 7ms

Power supply: 24 V DC +20% -10%

integrated visual alingment device and soiling indicator

Safety light curtain ULCT 200/24

Safety class: 4

Range: 5m

Response time: 7ms

Power supply: 24 V DC +20% -10%

integrated visual alingment device and soiling indicator

Rear safeguard:

Two-beam light grid ULVT 500/2R

Safety class: 4

Range: 8m, optional 15m

Response time: 4ms

Power supply: 24 VDC +20% -10%

integrated visual alingment device and soiling indicator

optional:

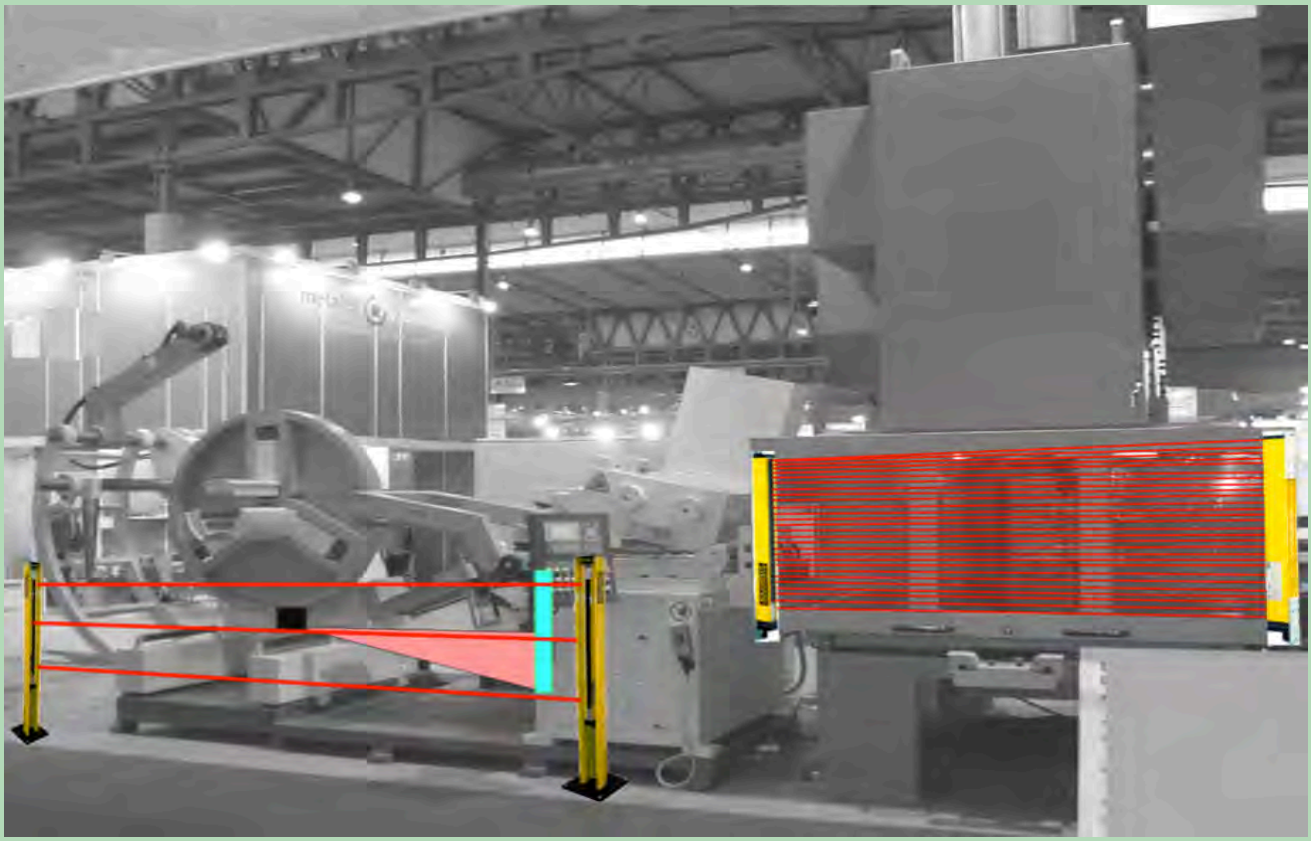
Two-beam light grid EU2K 500/2

Range: 10m

Response time: 12ms

Power supply:
24 VDC +20% -10%
or
230VAC

Punching machines / Presses in the metal working industry



Automatic control and safeguarding of punching machines and presses

With automatic feeder devices in metal-working industry

Continuous control of material feeding

Protection of punching tool by detection of weld seam indicators

optional

Protection of punching tool by ejection control

Safeguarding of the area around the feeding attachment device

Safeguarding of the pedestrian accessible inserter area

DIN EN ISO 9001
Reg.Nr. 96007

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

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

FIESSLER ELEKTRONIK

Safeguarding punching machines and presses in metal-working industry

Usually, "endless" steel bands from coils are made from single steel band segments welded together. Compared with remaining band material, the material hardness of these weld seams is considerably higher than that of the other material. As soon as these weld seams enter the punching station, a crashing of the punching tool may happen. Therefore, the weld seams are frequently marked by a special hole punched into the band in order to indicate the individual position of these weld seams.

Hole detector GLSL:

This sensor detects a punched weld seam indicator at a tape speed of up to 30m/s. As soon as this indicator occurs, the output of the hole detector switches. This produces an "idle stroke" of the punch. The band sector with the weld seam will be conveyed through the range of the punching tool without any punching stroke performed. This prevents any damage that may occur to the punching tool.

Safety Light curtains ULVT or BLVT:

Finger protection at a resolution of 14mm or 30mm, available with programmable blanking function as option.

Safety light grids ULVT

Pedestrian protection by large-scale fencing-off of the entire installation using light grids with a detection range of up to 60m.

Loop sensor GSD:

This sensor measures the loop of a band-shaped material (e.g. of a steel tape). The signal provided is proportional to the blanking of the sensor field by the belt material.

By the use of this signal, a constant speed control of the speed drives A and B is enabled. This provides a constant material feed.

Monitoring of ejected pieces by SLVT:

The ejection control provided by an SLVT detects the stamped metal parts exiting the punching station. This makes sure that no punching stroke will be carried out if there is still a stamped part remaining within the range of the punching tool.

("protection of punching tool").

Safety for filter press

according to the latest standard

Complete solution for the safety of filter presses

Safety category Type 4 - SIL 3 - Performance Level PL e

Retrofit kit for all common and older safety light curtain types

Reinstallation with integration proposal

optional

Very short reaction time and large detection range

Standard: IP65 - optional: IP67

Optional: Ex-protection regarding ATEX 94/9 resp. ATEX 95

Fiessler Elektronik GmbH & Co. KG
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

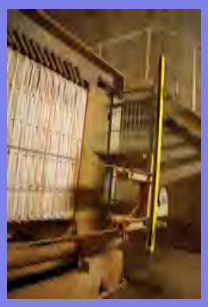
Safety light curtain for safeguarding of a filter press are electro-sensitive protective devices (ESPE) and designed for protection of persons from accidents. This is realized by protecting the hazardous sites and areas of the filter press, enabling any access to inside of the filter press only by crossing the protective field created by the safety light curtain. When entering the protective field, the light beams are interrupted and the machine will be reliably stopped

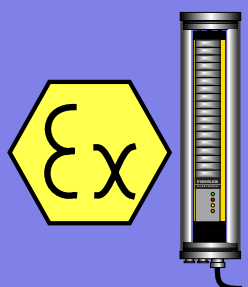
Safety light curtains for safeguarding of filter presses are caracterized by:

- examination by the German technical surveyor authorities (TÜV)
- compliance with **Type 4** (EN 954-1 and IEC 61496 bzw. EN 61496)
  SIL 3 (EN 61508),
  Performance Level PL e (ISO 13849-1)
- built-in self-monitoring device without auxiliary circuitry
- compact, sturdy structural shape
- simple installation and adjustment
- very short reaction time and large protection range
- IP65 optional IP67 housing, additionally with Ex-protection regarding ATEX 94/9 resp. ATEX 95

Advantages

Our experience ----> for your safety





Complete solution for safeguarding of filter presses

- Fiessler Elektronik has more than 50 years experience in safeguarding plants and equipment like e.g. filter presses. As an expert for safety solutions, Fiessler Elektronik offer different complete solutions for the safe guarding of new and used filter presses. Besides safety light curtains, which are caracterized by very short reaction times and large protection ranges (up to 30m for hand protection (minimum resolution ø= 30 mm) and safety controller, Fiessler Elektronik offers also complete installations.

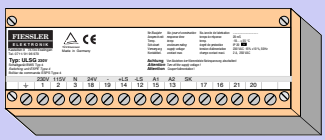
Retrofit kit for all common and older safety light curtains types

- Already existing components are replaced by more efficient and recent safety light curtains. As a result, your plant will increase in value and brought up to date. Their serviceable times will be greatly increased by the short response time, the large protection range and the most recent control technology. Therefore, unwanted down times will be prevented.
  A renovation can be carried out without any major interference in to the machine control system and time exposure by well corresponding retrofit kits
  Fiessler Elektronik application engineers are available for integration proposals. Therefore a modification made by the operating company is possible.
  In addition, Fiessler Elektronik can offer you a complete installation by our service engineers.

Retrofit kit:

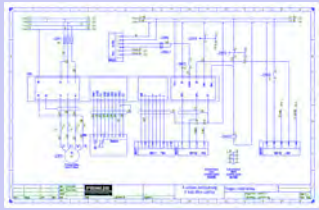
- Safety light curtain: e.g..: ULVT 1800/ 126
  Scanning field high 1800mm
  min. resolution ø 30mm (hand protection)
  max. range 24m (optional 30m)
  different protection field highs are available in 100m steps

-mechanical mounting material: mounting brackets in different versions.



-optional: -IP67 protection housing (for cleaning with high pressure water blaster)
-EX-protection regarding ATEX 94/9 resp. ATEX 95

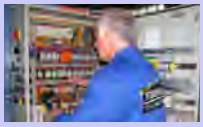
-Power supply: ULSG



-Integration proposal: -electrical plan processing
-mechanical mounting

-Installation: a) by the operating company
b) by Fiessler Elektronik service engineers

-Approval: evidenced approval by Fiessler Elektronik service engineers



Is your filter press up to date yet ???

Fiessler Elektronik Kastellstr. 9
D - 73734 Esslingen

Telefon: +49 (0) 711 / 91 96 97-0 Internet: http://www.fiessler.de
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Selection table --> Safety -controller

FIESSLER ELEKTRONIK

Safety category	Hardware							Operation mode						Features																Programming				Controller
	Input, central	Outputs, central	Interface, serial	Expandable with a safe bus system	Max. remote inputs	Max. remote outputs	Display	Safe shut off	Set up mode	Reduced speed monitoring	Muting	PSDI (presenece sensing device initiation)	Selector switch mode	High-speed inputs	High-speed outputs < 1ms	Emergency stop monitoring	Safety door monitoring	Two hand control	Safety light curtain type 4 and 2	Operation mode selector switch	EDM (external device monitoring	Overrun control	AKAS	Programming of blanking light curtain	Connection of HMI	Implementation in field bus system	Positioning monitoring	Safe detection of direction of rotation	Limit speed monitoring	Plug-on type for light barriere receiver	Top-hat rail mounting	Integrated Muting lamp	by Hex-switches	Makro Paramming	Fix Programmming	Free Programming	
Category 4 SIL 3 (EN 61508) Performance Level PL e EN 954-1 and IEC 61496 EN 61496, (ISO 13849-1)	8	2						✓			✓		✓						✓		✓									✓	✓				✓		**PLSG1**
	8	2					✓	✓			✓		✓						✓	✓	✓									✓	✓		✓				**PLSG2**
	8	2					✓	✓			✓	✓	✓			✓	✓	✓	✓	✓	✓			✓						✓	✓		✓				**PLSG3**
	10	3						✓			✓		✓						✓		✓										✓				✓		**PLSG1K**
	10	3	1				✓	✓			✓		✓						✓	✓	✓			✓	✓						✓		✓				**PLSG2K**
	10	3	1				✓	✓			✓	✓	✓			✓	✓	✓	✓	✓	✓			✓	✓						✓		✓				**PLSG3K**
	36	16	2					✓	✓		*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓			✓	✓	**FPSC-B**
	36	16	2	✓	168	84		✓	✓		*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓			✓	✓	**FPSC-AD**
	36	16	2					✓	✓	✓	*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	**FPSC-B-C**
	36	16	2	✓	168	84		✓	✓	✓	*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	**FPSC-AD-C**

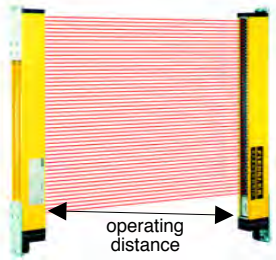
* up to 4 Muting applications with one safety plc FPSC possible

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

Snap-On relay output module LSRA

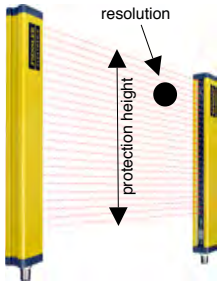
Safety Muting controller
PLSG1K/ PLG2K
Compact
safety controller PLSG3K
for DIN rail mounting

Safety PLC
Programmable Safety Centre
FPSC

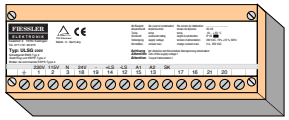


ULVT - BLVT
TLVT - ILVT

Self
supporting
columns



ULCT - BLCT
TLCT - ILCT



Power supply with
potential free relay outputs
ULSG

CE TÜV UL LISTED ZERT Ex optional

L

Seite

Safety sensors — C

-Type 4 Safety-light barrier / curtain (selection table) — C
Safety light curtains, Safety light grids ULVT, BLVT — C 1
Compact Safety light curtains ULCT, BLCT — C 2
2-beam safety light ULVT 500/2R — C 3
4-beam safety light ULVT 1200/4R — C 4
Single beam light barrier EU2K — C 5

-Typ 2 Safety-light barrier / curtain (selection table) — D
Safety light curtains, Safety light grids TLVT, ILVT — D 1
Compact Safety light curtains TLCT, ILCT — D 2

-Cascading of safety light curtains and safety light grids — E

-Accessories (Safety sensors) — F
Snap-On relay output module LSRA , LSRA-T — F 1
Self supporting columns, shock protector for safety light barriers — F 2
Power supply ULSG with potential free relay outputs — F 3
Blanking-Programmer BLPG, BPSG — F 4
EEx-P-protection for safety light barrier Type xLVT und xLCT — F 5
Protection housing IP 67,for safety light barrier Type xLVT and xLCT — F 6
Laser adjustment device JHL2 — F 7
FGUL Retrofit -kit for FGS/MSL to ULVT — F 8
Fiessler safe expander module FSEM — F 9
AS-i-Safe module — F 10

-Press brake safety — G
Press brake safety system AKAS® — G 1

-Safety foot pedal — H
Safety foot pedal FL1-528-ZSD4-U — H 1
Safety foot pedal FS2-528-ZSD4-U — H 2

-Safety area scanner FLSC — I
Type 3 area scanner FLSC — I 1

-Safety mats — J
Safety mats STM — J 1
Controller STM STK 41-32 — J 2

-Applications — K
Safety light grid for areas with heavy dirt accumulation — K 1
Safeguards at guillotine shears — K 2
Punching machines and presses in the metal working industry — K 3
Safety for filter presses — K 4

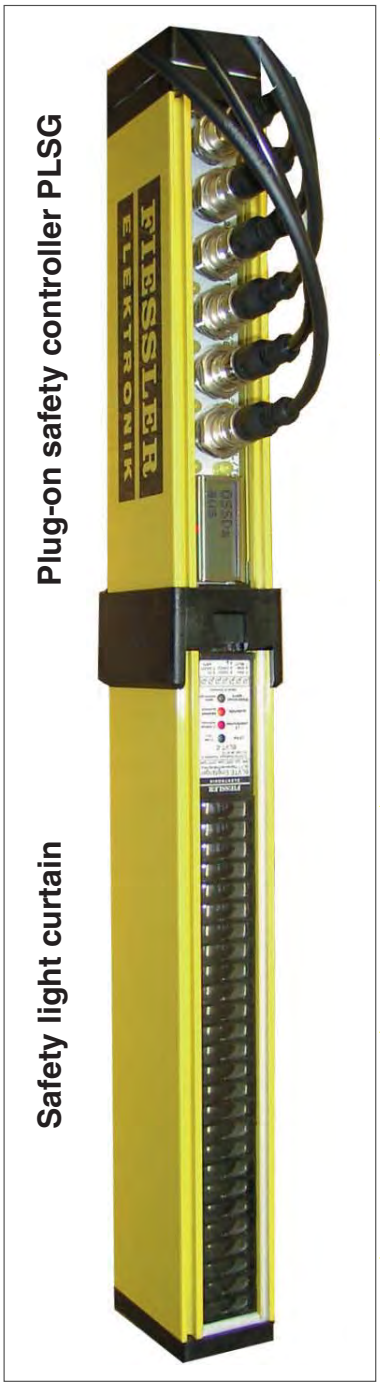
Safety controller — L

-Safety control box/ safety controller/ safety PLC (selection table) — L
Plug-on safety controller for the light curtain / light grid PLSG — L 1
Compact safety controller PLSG K — L 2
Programmable Safety Centre FPSC — L 3

-Accessories (safety controller) — M
Fiessler safe expander module FSEM — M 1
Human Machine Interface HMI (see Q 1) — Q 1
Muting sensors (see P 7) — P 7

Plug-on safety controller for safety-light barriers

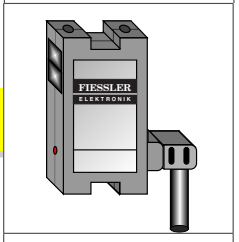
Muting controller PLSG 1
Muting controller PLSG 2
Compact multifunction safety controller PLSG 3



Safety limit switch

Emergency stop

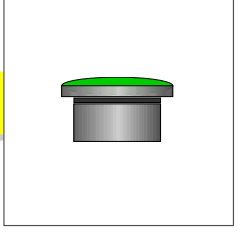
Add. Muting sensors



Add. Muting lamp

Two hand control

Start button



The controller of the series PLSG save money:

- Wiring at one side

- Reduction of cable material
- Reduction of installation expenses
- Saving on cabinet space
- Integrated Muting lamp

- Direct wiring of safety components

- Saving on additional safety controller for Emergency Stop, door limit switch, two hand control or PSDI mode

- Minimal programming effort

- no need of software
- short starting up time
- fast replacement in case of malfunction

PLSG → Optimal functionally with minimal effort

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D - 73734 Esslingen
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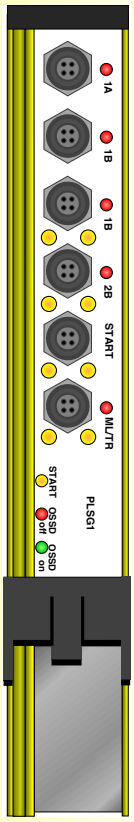
PLSG 1

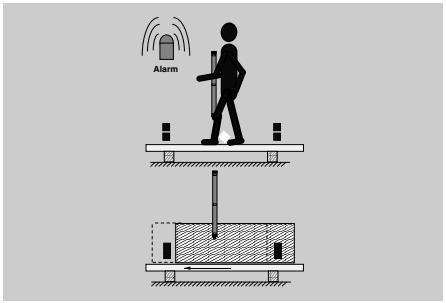


Muting with PLSG 1

Range of functions PLSG 1
Override function (not selectable)
Restart interlock (not selectable)
EDM (external device monitoring)
Muting time monitoring (fix 13,5 h)

The Muting function enables the safety for a person with the unrestricted flow of material at the same time

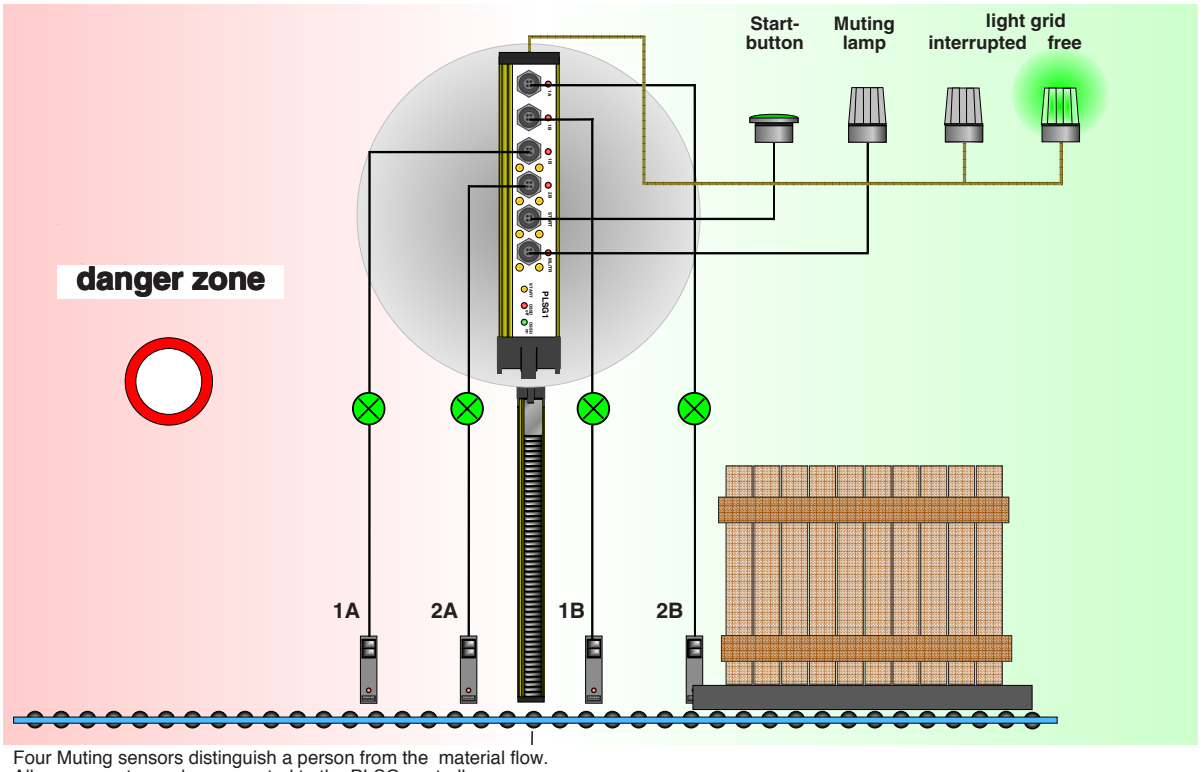
- Safeguarding of the pedestrian access of an automatic production plant
- Safeguarding of a gateway entrance to a production area
- Safeguarding of a palletizer
- Material-handling technology



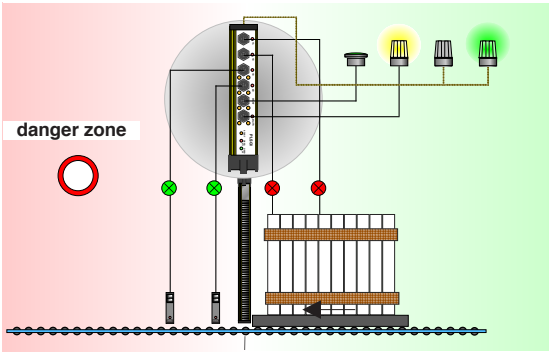
Differentiation of man-material flow

Example for palletizer

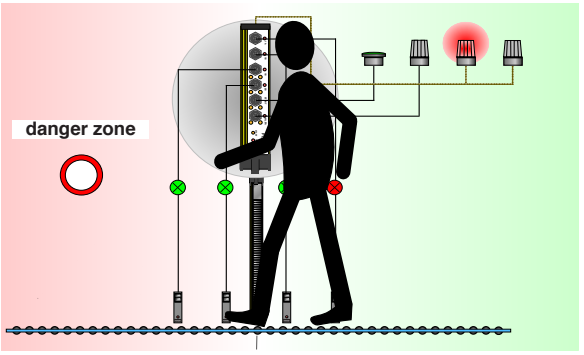
Complete monitoring of an access to a dangerous area



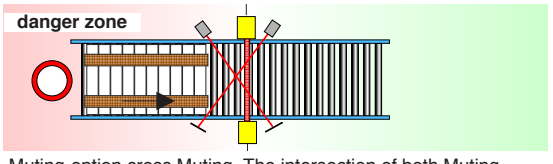
Four Muting sensors distinguish a person from the material flow.
All components can be connected to the PLSG controller.



Muting termination: having all 4 Muting sensors interupted and be released again



With proper arrangement of the sensors a person cannot interrupt any of the Muting sensor pairs A or B at the same time.



Muting-option cross Muting. The intersection of both Muting sensors has to be inside the dangerous zone.

The PLSG offers useful solutions for all Muting applications!

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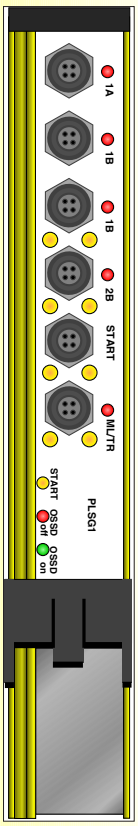
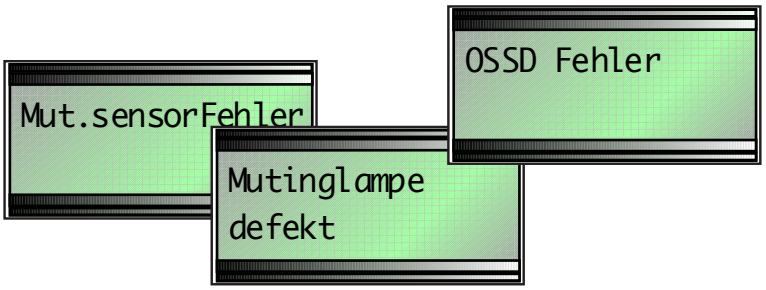
PLSG 2



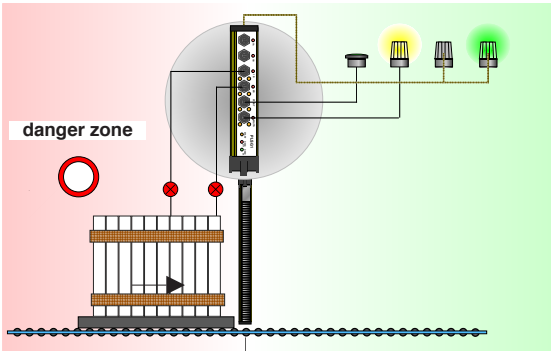
Range of functions PLSG 2

In addition to version PLSG 1

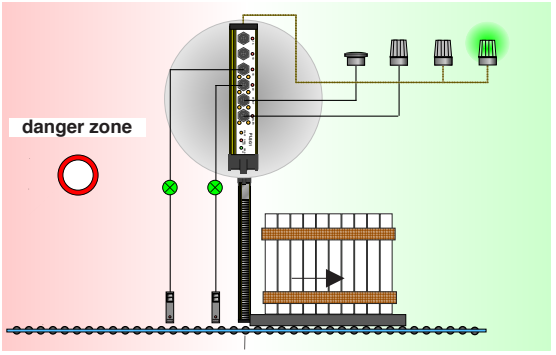
- Delayed muting termination (adjustable)
- Display of the operating condition in plain text (selectable between English and German)
- Immediate Muting termination if protective field is free again.
- OSSD 2 cut-off delay (for regulated slow down of e.g. robotics)
- EDM (external device monitoring) (selectable)



Display of the operating condition in plain Text (PLSG 2/3).



Manipulation safe Muting only if the material flow is going out of the dangerous zone. Muting of the safety light grid will be executed as soon as the material interrupts the two Muting sensors.



As soon as the safety light grid is free again, the Muting condition will be terminated.

PLSG 3

Range of functions PLSG 3

In addition to version PLSG 1 and PLSG 2

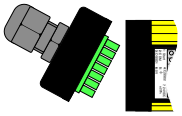
- Emergency Stop connectable
- Protection mode with two hand control and emergency stop circuit
- Two hand control direct connectable (in this version only two Muting sensors can be connected additionally)
- PSDI mode (cycle control) programmable up to 4 strokes
- Work cycle time monitoring in combination with PSDI mode
- Programming of Blanking safety light curtains
- Selector switch mode in combination with the program box BPSG/BLPG

Technical data

Power supply:	24 V DC, +20% -10%
Max. response time:	3 ms + resonse time safety light grid XLVT
Dimension:	40x61x220 mm (BxHxT) plus. PG screw connection
Output:	OSSD 1 and 2 - failsafe PNP-outputs
Protection enclosure:	IP 65
Weight:	450g
El. connection:	integrated connector with PG 9 for strain relief
El. connection for the sensors:	M12 connector

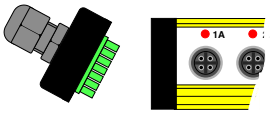
Electrical connection

Connection between safety light grid and PLSG



take off the connection cap

Plug on the PLSG-extension. Screw down the unit with the t-slot screws.



After wiring put on the connection cap again.

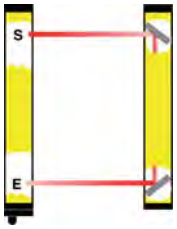
Matching safety light curtains, -grids and Muting sensors

Safet light curtains, -grids

ULVT safety light curtain,-grid

BLVT safety light curtain,-grid with blanking function

ULVT 500/2R

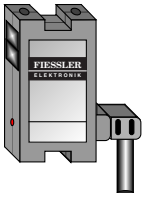


Muting sensors

e.g.

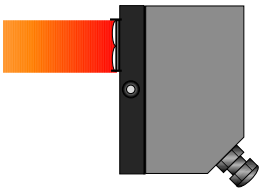
Reflex light beam

GR 5/24, with M12 plug



Multifunction light beam

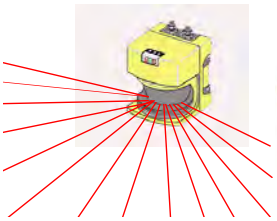
MFL, with M12 plug



Other safety equipment

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

Safety mats



Proximity laser scanner

Safety PLC
Programmable Safety Centre
FPSC

Press brake protection system
AKAS

Light curtains for safety, controlling and measuring applications

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.

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 a 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.

Innovation award

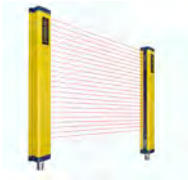
for exemplary performance in the development of the press brake protection system AKAS.
The award was bestowed upon Fiessler Elektronik by the ministry of trade and commerce of the federal state of Baden-Württemberg.

Fiessler Elektronik
GmbH & Co. KG
Kastellstr. 9
D-73734 Esslingen

Telefon: ++49(0)711-91 96 97-0
Fax: ++49(0)711-91 96 97-50
Email: info@fiessler.de
Internet: www.fiessler.de

Fiessler Elektronik has respresentations in all major industrial nations.

Compact safety controller PLSG...K



- **Compact safety controller type 4**
- **Short reaction time 3,5 ms**
- **Easy to program - no software needed**
- **Contactor- or valve- control (EDM)**
- **Cyclic control (PSDI) 1-4 cycle**
- **Emergency-stop circuit monitoring**
- **Optional safety relay output**
- **Optional integrated LCD-Display**
- **Muting, Blanking**

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

Application

- Monitoring of hydraulic and mechanical presses
- Monitoring of revolving-transfer tables
- Monitoring of press brakes
- Monitoring of special purpose machines
- Access safeguarding of automatic production lines
- Monitoring of an access to a manufacturing cells
- Monitoring of palletisers
- conveyor or storage techniques

- no software required
- only selecting of already existing safety logic arrays via hex switches
- shortest commissioning times
- fast replacement in case of error
- Savings of additional safety control unit for
  Emergency-stop circuit, safety gate switches,
  two hand control
  or
  cyclic control

Technical data

Safety category	4, PL e, SIL 3
Protection type / housing size	IP 40 housing, IP 20 terminals 83,5mm x 90mm x 119mm (W x L x H) tophat rail mounting
Ambient operating temperature	-10 to 55 °C
Supply voltage	24 V DC, ±20%,
Current consumption	Max. 250 mA
Outputs	**3 outputs** **OSSD1 and OSSD2:** Fail-safe PNP outputs, max. 0.5 A, monitored for short-circuit and cross-connections **OSSD3** (category 3 only with OSSD1 and OSSD2): 2-channel control, PNP output, max. 0.5 A
Electrical connection	Plug-in terminal strips
Max. response time	After interruption of the light grid's protective field : 3.5 ms + XLVT response After interruption of the emergency-stop circuit: 30 ms if both circuits open, or 63 ms if only one circuit opens due to a defect **If OSSD 2 turn off delay is active:** **0.5 s.**
Inputs	**12 - 16 inputs** depending on model 0V to 24 V DC +-20% / 10 mA, (at least 15 V to allow detection of high levels).
Externe Mutinglampe	24V max. 0,5 A, min 50 mA
Option ...R **safety relays**	**8 outputs** Potential-free, monitored, force-guided switching contacts: 2 x 1 normally closed, 2 x 2 normally open and 2 x 2 normally open in series (1 normally open contact of each safety relay) max. 2 A / 250V AC or 60V DC, 30W; if an inductive load is employed, connect spark quenching elements
Option ...S RS 485 interface	9600 Baud, 8 Datenbit, 1 Startbit, 1 Stopbit

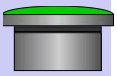
Device overview / Features / Applications

Connectable components:

Safety light barrier

Muting sensor

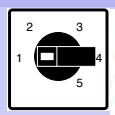
Safety limit switch



Start push button

Muting lamp

Two hand control

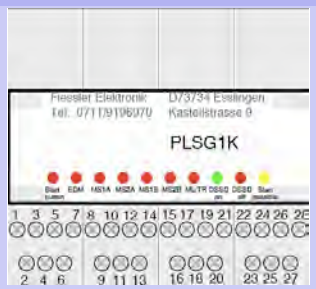


Selector switch

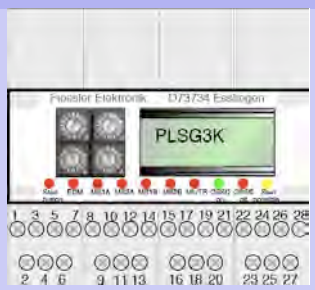
Emergency stop

Functions	PLSG1K	PLSG2K	PLSG3K	
EDM **Contactor / valve control** of subsequent switching elements	with	with / without	with / without	
Restart interlock Start enabled via a button	with	with / without	with / without	
Restart interlock only during hazardous movement (for example, during insertion operations)	-	-	•	**Infiltration of the protective field is possible during a standstill or non-hazardous movement without renewed enabling of start.** 2 outputs for external display: Protective field state and restart interlock
PSDI **Cyclic control** (for example, during insertion operations) with work time monitoring (30s or 120s)	-	-	•	**Cyclic infiltration of the protective field controls machine operation** 1-cycle, 2-cycle, 3-cycle or 4-cycle operation 2 outputs for external display: Protective field state and restart interlock
Emergency-stop circuit monitoring Guard doors, emergency-stop	-	-	•	
Two-hand start Start enabled via two-hand switch	-	-	•	
2-stage output deactivation Deactivation of control drives (for example, robots)	-	•	•	On interruption of the protective field, OSSD1 and OSSD3 switch off immediately and instructs the machine (for example, robot) to shut down within 0.5 s. After 0.5 s, OSSD2 safely deactivates the machine.
Display Status and error messages	-	•	•	2 x 8 character LCD
BLVT light grid blanking functions 11 protective-field blanking modes	-	-	•	**In case of one-time or infrequently modified blanking** Protective field blanking in the light grid is performed through one-time programming with the hex switches after a voltage reset. The blanking function remains saved in the light grid until new programming.
Cross-Muting Muting with two Muting sensors	•	•	•	**Brief bypass of the light grid is possible**
Serial-Muting with 4 or more Muting sensors	•	•	•	**Brief bypass of the light grid is possible**
Muting with muting time monitoring	•	•	•	**Brief bypass of the light grid is possible** If material comes to a stop in the muting zone, muting is deactivated or the light grid is activated after the muting time has elapsed.
Delayed end of muting	-	•	•	Manipulation-proof muting when material flows exclusively outward from the hazard zone. Muting sensors are located in the hazard zone.
Stopping of Muting time monitoring	-	•	•	Prevents the unwanted shut-off of the machine in case of material accumulation caused by exceeding the programmed Muting time.
Immediate end of muting on clearing of the protective field	-	•	•	The muted state persists only as long as absolutely necessary. If this function is active, there is no muting time limit.
Override (for example, on belt standstill) after unscheduled stop	•	•	•	
Option ...R 2 safety relays	•	•	•	Potential-free switching contacts: 4 NO, 2 NC, 2 x 2 NO in series (1 per relay)
Option ...S Serial output of display data	-	•	•	Serial output of messages RS 485 interface for status / error messages / 9600 baud, 1 start bit, 1 stop bit
Option ...P Selector switch operation	-	•	•	a) Storage and recall of up to 5 operating modes in the PLSG3K_P b) Storage and recall of up to 5 beam blanking types in the BLVT/BLCT light grid c) Storage and recall of up to 5 operating modes in the PLSG3K_P; storage and recall of up to 5 beam blanking types in the BLVT/ BLCT light grid

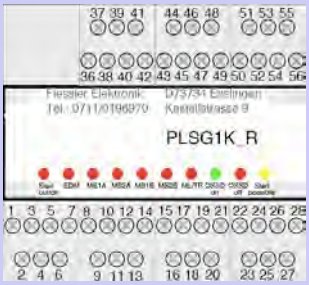
Device overview
(excamples)



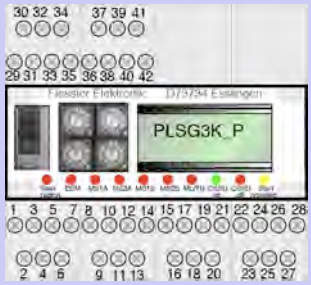
PLSG1K



PLSG2K oder PLSG3K



PLSG1K R



PLSG3K P

order number

article description	article no (code)
PLSG 1K for mounting in switch cabinet (top hat rail)	PLSG1K
PLSG 1KR for mounting in switch cabinet (top hat rail), with 2 safety relais.	PLSG1KR
PLSG 2K for mounting in switching box (top hat rail), programmable, with display	PLSG2K
PLSG 2KR for mounting in switch cabinet (top hat rail), programmable, with display, with 2 safety relays	PLSG2KR
PLSG 2KP for mounting in switch cabinet (top hat rail), programmable, with display, teach in of beam blanking BLVT	PLSG2KP
PLSG 2KRS for mounting in switch cabinet (top hat rail), programmable, with display, with 2 safety relays, serial output of display via RS 485	PLSG2KRP
PLSG 2KRS for mounting in switch cabinet (top hat rail), programmable, with display, with 2 safety relays, serial output of display via RS 485	PLSG2KRS
PLSG 2KS for mounting in switch cabinet (top hat rail), programmable, with display, serial output of display via RS 485	PLSG2KS
Safety control **PLSG 3K** for mounting in switch cabinet (top hat rail), programmable, with display	PLSG3K
Safety control **PLSG 3KR,** for mounting in switch cabinet (top hat rail), programmable, with display, with 2 safety relays	PLSG3KR
Safety control **PLSG 3KP** programmable for mounting in switch cabinet (top hat rail mounting), teach in of beam blanking BLVT	PLSG3KP
Safety control **PLSG 3KRP** programmable for mounting in switch cabinet (top hat rail), with 2 safety relays, teach in of beam blanking BLVT	PLSG3KRP
Safety control **PLSG 3KRS** programmable for mounting in switch cabinet (top hat rail mounting), with 2 safety relays, serial output of display via RS 485	PLSG3KRS
Safety control **PLSG 3KS** mounting in switch cabinet (top hat rail), programmable, with display, serial output of display via RS 485	PLSG3KS

FIESSLER ELEKTRONIK

Data sheet

Programmable safety center

FPSC

Fiessler Programmable Safety Center

Flexible Hard- and Software concept

Available with a safe bus system and / or counter inputs

Reduction of expenditures in Mounting and Installation

Easy programmable

Software modules tested and certificated

Safety category 4 according to EN 954-1, SIL 3 according to IEC 61508

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

Ex optional

c UL us LISTED

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

System description

The FPSC Fiessler Programmable Safety Center is a programmable electronic safety controller for personal protection, i.e. for safety functions. The FPSC complies with the highest safety requirements:

- SK1 up to SK 4 according to EN 954-1
- SIL 1 up to SIL 3 according to EN IEC 61508
- PL a up to PL e according to prEN 13849-1

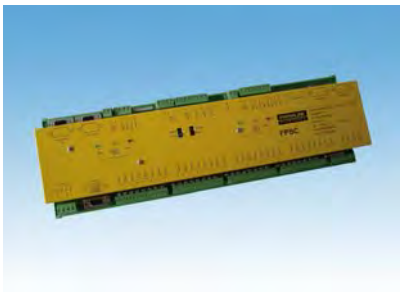
The product family FPSC provides maximum flexibility within its hardware and software structure. The FPSC - AD version offers the possibility to connect decentralized I/O modules via the implemented safe bus system. This guarantees a modular system design that offers flexibility therefore reducing the costly and often elaborate configuration of the safe system bus.

The safety-related functions are programmable by using pre-assembled and tested software modules. The chaining is made by simple assignment of input , i.e. output adresses. Intermediate data are stored in the temporary storage. There are various ready-to-use software modules at your disposal.

For the communication with a superior control, i.e. for the operating sequence control or technology control, a serial interface is provided. The transfer of data for visualizing as well as the transfer of machine-relevant data can de realised via this interface

The simple snap-on mechanism for fastening the items on a top hat rail in the control cabinet considerably reduces the installation expenditure of the items of the product family.

Overview of the product family FPSC, hardware : safe base units



FPSC - B, basic configuration

32 safe inputs
- 4 fast safe inputs
- 4 fast safe outputs
- 4 fast outputs, bi-polar switching
- 8 safe outputs, monopolar switching
- 2 serial interfaces

FPSC - AD, enhanced configuration

32 safe inputs
- 4 fast safe inputs
- 4 fast safe outputs
- 4 fast outputs, bi-polar switching
- 8 safe outputs, monopolar switching
- 2 serial interfaces
- 1 safe bus interface for enhancing by decentralized I/O modules

FPSC - B-C, basic configuration with counter inputs

I/O configuration like FPSC-B, additional

2 fast counter inputs (0,5 MHz)

FPSC - AD-C, basic configuration with counter inputs

I/O configuration like FPSC-B, additional

2 fast counter inputs (0,5 MHz)

Overview of the product family FPSC, hardware: safe decentralized modules

FPSC - RS8I, decentralized input module
8 safe inputs
1 safe bus interface

FPSC - RS16I, decentralized input module
16 safe inputs
1 safe bus interface

FPSC - RS24I, decentralized input module
24 safe inputs
1 safe bus interface

FPSC - RS4O, decentralized output module
4 safe outputs
1 safe bus interface

FPSC - RS8O, decentralized output module
8 safe outputs
1 safe bus interface

FPSC - RS12O, decentralized output module
12 safe outputs
1 safe bus interface

FPSC - RS8I4O, decentralized input/ output module
8 safe inputs
4 safe outputs
1 safe bus interface

FPSC - RS8I8O, decentralized input/ output module
8 safe inputs
8 safe outputs
1 safe bus interface

Overview of the product family FPSC, hardware: safe decentralized modules

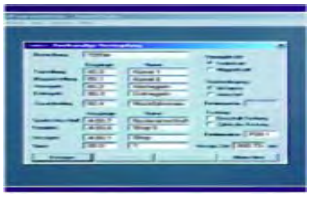
FPSC - RS16I4O, decentralized input/ output module
16 safe inputs
4 safe outputs
1 safe bus interface

Overview of the product family FPSC, hardware: non-safe decentralized signalling modules

FPSC - RM8IN, decentralized input module
8 non-safe inputs, common negative potential
1 CAN bus interface

FPSC - RM8ON, decentralized output module
8 non-safe outputs, common negative potential
1 CAN bus interface

Overview of the product family FPSC, software

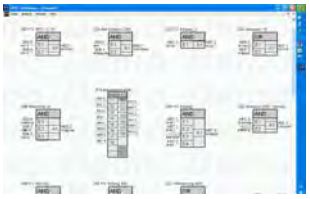


FPSC - PR-S, Programming software

Software to program the base units

S: single user license

M: multi-user license



FPSC - Diag, Diagnosis and Analyzing Software

Software for the back-analyzing of the application program and for visualizing of both inputs and outputs, for the visualization of the status of the flags and of the system status.

S: single user license

M: multi-user license

Overview of the product family FPSC, accessories

FPSC - RS232 cable

Cable between the programming unit (PC, Notebook etc.) and the base units for programming the parameters

FPSC - USB / RS232 adaptor

Interface converter from USB standard to RS232 for entering the parameters into the base units

FPSC - CAN cable

cable for the safety-related networking of the decentralized modules and the base unit

Overview of the product family FPSC, fieldbus module

FPSC - Profibus-DP

Fieldbus Module to connect the FPSC via RS232 to Profibus-DP

FPSC - Ethernet-TCP/IP

Fieldbus Module to connect the FPSC via RS232 to Ethernet TCP/IP

Technical Data Product Family FPSC

Technical Data	FPSC - B, FPSC - AD
Field of application	parameterizable safety control with optional safety-related bus interface
Safety relevant classification	up to category 4 according to EN 954-1 up to SIL 3 according to EN IEC 61508 up to PL e according to prEN 13489-1
Electrical data	**FPSC - B, FPSC - AD**
Power supply	24 V DC
Tolerance range	19,2 ... 30,0 V DC max. 10% residual ripple
Load current	typ. 350 mA
Protection of the power supply	T 6,3 A
Connections:	Plug base with screw terminals
power supply	max. 2,5 mm2
Input level	max. 1,5 mm2
output level	max. 2,5 mm2
CAN-connector (optional)	Sub-D plug 9-pin
Interfaces	RS 232 Programming interface RS 232 User interface
Minimum response times High Speed inputs => High Speed outputs	1 ms
Mecanical data	**FPSC - B, FPSC - AD**
Dimensions (HxBxT)	127 x 390 x 80 mm
Mounting on top hat rails	according to DIN 50 022
Protection class of the housing	IP 20
Protection class of the terminals	IP 20
Weight	1,65 kg
Environmental conditions	**FPSC - B, FPSC - AD**
Operating temperature	0 ... +60° C
Storage temperature	-25° C ... +70° C
Relative humidity	30% ... 85% RH
Striking and creep distances	DIN EN 50 178
Vibrations	DIN EN 60 068-2-6
EMC	DIN EN 61 000-6-2
Bedewing / Condensation	not permitted

Inputs	FPSC - B, FPSC - AD
Number of safe standard inputs	32
Number of safe high speed inputs	4
Galvanic isolation	yes
Signal level at log "0	0 ... 2 V DC
Signal level at log "1"	15 ... 28 V DC
Input current	5 mA (bei 24 V)
Minimum impulse duration at the standard inputs	20 ms
Status displayed via	LED
Single Pole Outputs	**FPSC - B, FPSC - AD**
Number of safe standard outputs	8
Number of high speed outputs	4
Galvanic isolation	yes
Output current at log "1"	max. 2 A
Short-circuit protection	electronic
Status displayed via	LED
Dual Pole Outputs	**FPSC - B, FPSC - AD**
Number of safe dual pole outputs	4
Galvanic isolation	ja
Output current at log "1"	max. 2 A
Short-circuit protection	electronic
Status displayed via	LED
Counter inputs	**FPSC - B-C, FPSC - AD-C**
Number of counter inputs	2
max. inputs frequency	0,5 MHz
power supply for sensors	selectable 5V dc oder 24V dc
input level	5V TTL line driver

Technical Data decetralized modules FPSC - RSxxx

Technical data	FPSC - RSxxx
Field of application	Enhancing of the base units FPSC-B, FPSC-AD by safety- related inputs and outputs
Safety relevant classification	Up to category 4 according to EN 954-1 Up to SIL 3 according to EN IEC 61508 Up to PL e according to prEN 13489-1
Electrical Data	**FPSC - RSxxx**
Power supply	24 V DC
Tolerance range	21,6 ... 26,4 V DC max. 10% residual ripple
Load current	typ. 350 mA
Protection of the power supply	T 6,3 A
Connections:	plug base with screw terminals
power supply	max. 2,5 mm2
Input level	max. 2,5 mm2
output level	max. 2,5 mm2
CAN-connector (optional)	Sub-D Stecker 9 polig
Mechanical data	**FPSC - RSxxx**
Dimensions (HxBxT)	127 x 127 x 120 mm
Mounting on top hat rails	according to DIN 50 022
Protection class of the housing	IP 20
Protection class of the terminals	IP 20
Weight	1,0 kg
Environmental Conditions	**FPSC - RSxxx**
Operating temperature	0 ... +45° C
Storage temperature	-25° C ... +70° C
Relative humidity	30% ... 85% RH
Striking and creep distances	DIN EN 50 178
Vibrations	DIN EN 60 068-2-6
EMC	DIN EN 61 000-6-2
Bedewing / Condensation	not permittel

Inputs	FPSC - RSxxx
Number of safe standard inputs	8, 16, 24, according to the required configuation
Galvanic isolation	yes
Signal level at log "0	0 ... 2 V DC
Signal level at log "1"	15 ... 28 V DC
Input current	5 mA (for 24 V)
Minimum impulse duration at the standard inputs	20 ms
Status displayed via	LED
Dual Pole Outputs	**FPSC - RSxxx**
Number of safe dual pole outputs	4, 8, 12, according to the required configuation
Galvanic isolation	yes
output current at log "1"	max. 0,5 A
short-circuit protection	electronic
Status displayed via	LED

Technical Data decetralized modules FPSC - RSxxx, nonsafe remote I/O modules

Outputs	FPSC - RMxxO
Number of safe standard inputs	8, 16, 24, 32, 40, 48, 56 according to the required configuation
Power supply	24 V DC
Tolerance range	21,6 ... 26,4 V DC max. 10% residual ripple
Output current at log "1"	max. 0,1 A, non-inductive
Input current	5 mA (fori 24 V)
Weight	300 g
Operating temperature	0 ... +45° C, non bedewing

Overview of the available software modules

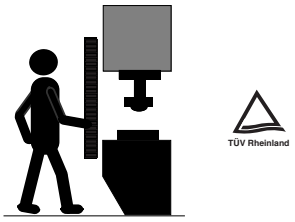
Software module		
Emergency OFF	single-channel (NA)	
	double-channel (NA)	
	possible selections:	
	Reset	Start button / Autostart
	feedback circuit	Yes / No
	switch-on testing	Yes / No
	cyclic (repeated) test	Yes / No
Safety switch	single-channel (Sis)	
	double-channel (SiS)	
	possible selections:	
	Reset	Start button / Autostart
	feedback circuit	Yes / No
	switch-on testing	Yes / No
	cyclic (repeated) test	Yes / No
Interlocking device, locked by snap-switch	single-channel (TZF)	
	double-channel (TZFW)	
	possible selections:	
	Reset	Start button / Autostart
	feedback circuit	Yes / No
	switch-on testing	Yes / No
	cyclic (repeated) test	Yes / No
Interlocking device, locked by magnet	single-channel (TZM)	
	double-channel (TZMW)	
	possible selections:	
	Reset	Start button / Autostart
	feedback circuit	Yes / No
	switch-on testing	Yes / No
	cyclic (repeated) test	Yes / No
Time delay	possible selections:	
	OFF-delay	
	ON-delay	
	timer	
Gate control	AND	
	NOT AND	
	OR	
	NOT OR	
	each of them with 8 input	
Contact multiplication	1 input	
	up to 8 outputs	
Pulse latch	possible selections:	
	level triggering	
	edge triggering	
Flip Flops	possible selections:	
	D-Flip Flop and RS-Flip Flop	
Enabling mode	possible selections:	
	Energy (with permissive switch)	
	Drive (mit Tipp)	
	Energy (no permissive switch)	

Overview of the available software modules

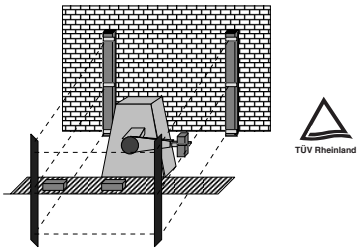
Software modules	
BLVT	Module for programming the different operating modes of the Fiessler Elektronik BLVT safety light curtains product series
AKAS 1 and 2	Module for the evaluation of data of the AKAS I or AKAS II systems
AKAS 3	Module for the evaluation of data of the AKAS III-M, AKAS II-M, AKAS LC-M, AKAS LC II-M
Overrun traverse measurement	For monitoring the overrun traverse of a press, e.g. of a press brake
Muting	Module for the control and evaluation of the Muting functions
Valve monitoring	Module for triggering and monitoring of hydraulic valves/contactors
Operating mode selctor switch	Safe selector switch for selecting the operation modes (1 out of 8)
Filter time	Module for the input filter adjustment of the High speed inputs in 16 stages
Two-hand control	Module for evaluation of data of a two-hand control panel
Diagnostics interface	Module for transmission of diagnostics information to a standard PLC or NC
Cycle operation	Module to control a machine in cycle operation e. g. presses. Up to 4 cycles programmable
Comment	Modul to comment the program
Counter Setup	Setup for counter parameters like sensor resolution, speed tolerance etc.
Position measurement	To set up to 16 positions (cams) selectable in mm or steps
Overrun traverse measurement via counter	To measure the overrun distance of a machine like press brakes
Speed monitoring	To monitor up to 8 speed profiles for under- or overstepping. Alternative monitoring of up to 4 speed profiles for under- and overstepping.
AKAS Muting System AMS	Software block for the AMS functionality
Detection of rotation direction (safe)	Detection of the rotation direction of a machine. Evaluation of both counter inputs
Detection of rotation direction (nonsafe)	Detection of the rotation direction of a machine. Separate evaluation of each counter input
(nonsafe) each counter input	Reset the counter values to the standard values

Delivery program

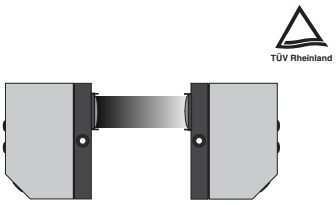
Fiessler Elektronik
Kastellstr. 9 D-73734 Esslingen
Telefon: 0711 / 91 96 97-0
Telefax: 0711 / 91 96 97-50
WWW.fiessler.de
E-Mail:info@fiessler.de



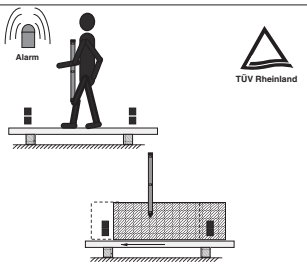
Safety light curtain



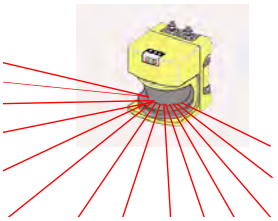
Safety light grid



Single safety light beam

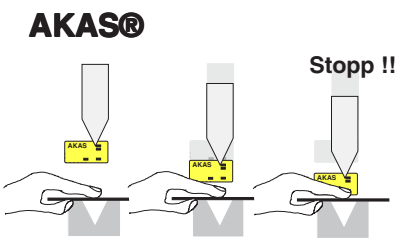


Saftey light grid with muting function



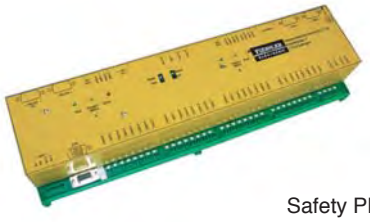
Proximity scanner

Safety mats

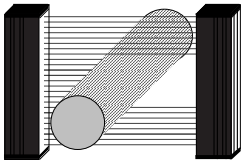


Press brake safety system

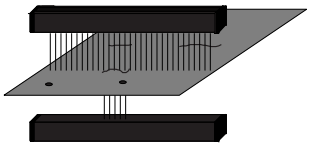
Safety foot pedal



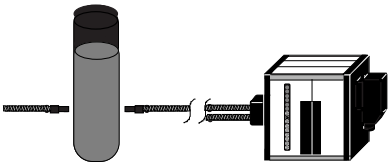
Safety PLC
Safety controllers



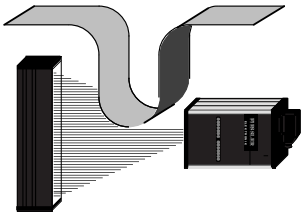
Measuring and controlling light curtains



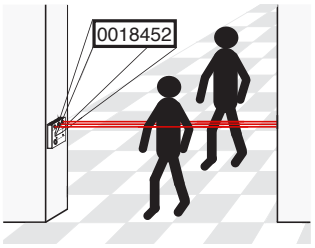
Hole detectors



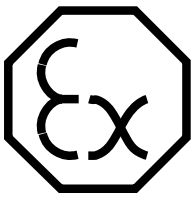
Turbidity sensors

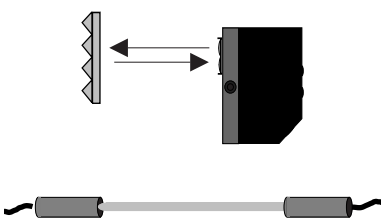


Analogue loop sensors



Counting light barriers





Light barriers for general purposes

Your application

FIESSLER ELEKTRONIK

Data sheet

Fiessler Safe Expander Module

FSEM

Safe contact expander module

For safety related applications up to cat. 4 ref. EN 954-1

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

3 positively-guided undelayed safety contacts

optional

Simple top hat rail mounting

LED indicator for both channel status

Activation optionally with one or two channels

DIN EN ISO 9001
Reg.Nr. 96007

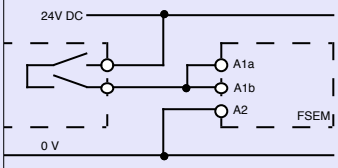
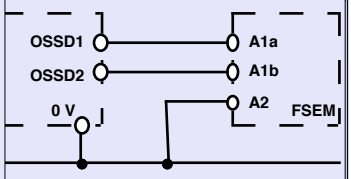
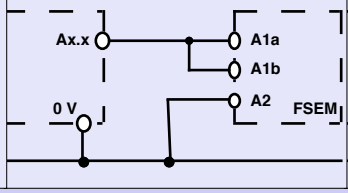
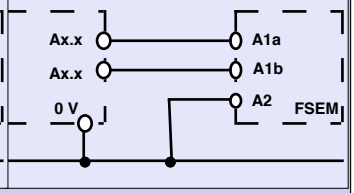
Fiessler Elektronik Kastellstr. 9
D - 73734 Esslingen

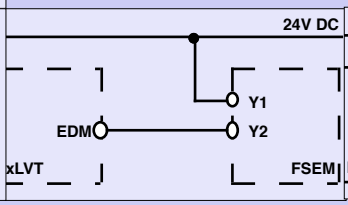
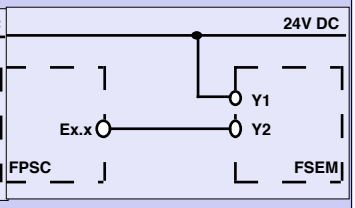
Telefon: +49 (0) 711 / 91 96 97-0 Internet: http://www.fiessler.de
Telefax: +49 (0) 711 / 91 96 97-50 eMail: info@fiessler.de

Application

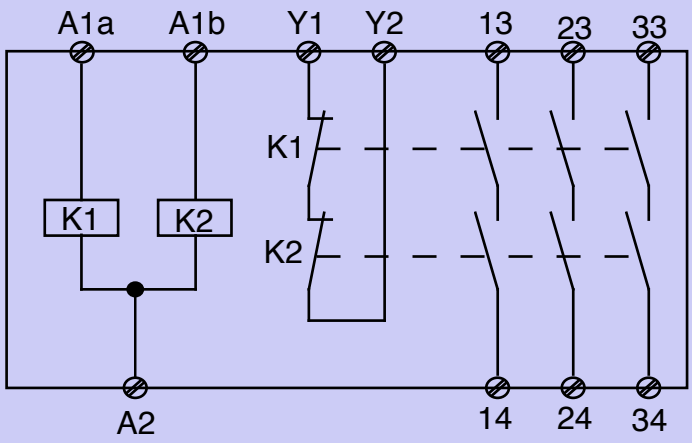
The safe expander module FSEM expands an existing circuit. As the output relays are monitored with the base unit feedback loop, it is possible to reach the same safety level to the contact expander module. Base units can be all safety devices with a monitored feedback loop. Fiessler Elektronik offers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

Operating modes

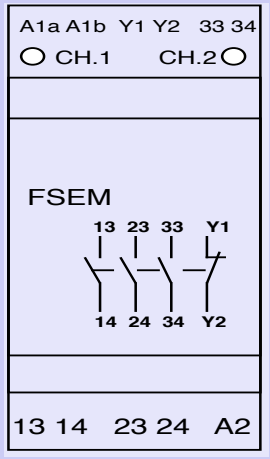
Input circuit	Single channel	Dual channel
Base unit: Safety relay		
Base unit: Safety light curtains series ULVT, BLVT, ULCT and BLCT		
Base unit: Programmable safety controller FPSC		

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 to use the Software block valve monitoring.		

Block diagram



Terminal configuration



Technical details

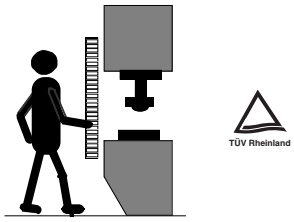
Electrical data:	
Supply voltage UB DC	24V
Voltage tolerance	19,2 ... 30V DC
Residual ripple DC	max. 10%
Output contacts in accordance with EN 954-1	Safety contacts: 3
Output breaking capacity at 240V AC	
13 14, 23 24	Imin:0,01A, Imax: 6A ohmic
Output breaking capacity at 160V AC	
33 34	Imin:0,01A, Imax: 6A ohmic
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)
Weoght (without connectors)	110 g
Ambient temperature	0° C ... 60°C
Switching Cycle life time	>50 x 106

Order reference

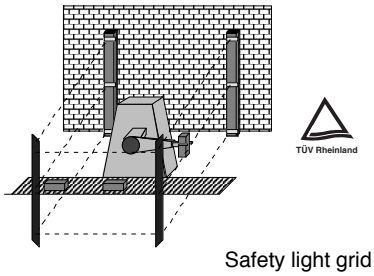
FSEM-C3-S	**with screw terminals**
FSEM-C3-F	with cage clamp terminals

Delivery program

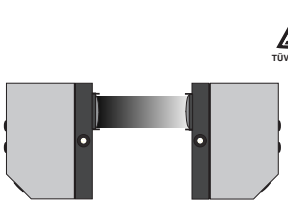
Fiessler Elektronik
Kastellstr. 9 D-73734 Esslingen
Telefon: 0711 / 91 96 97-0
Telefax: 0711 / 91 96 97-50
WWW.fiessler.de
E-Mail:info@fiessler.de



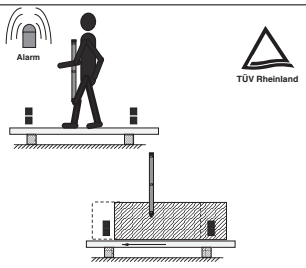
Safety light curtain



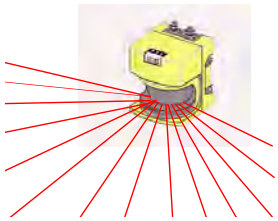
Safety light grid



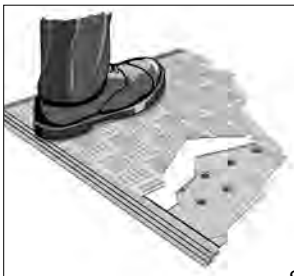
Single safety light beam



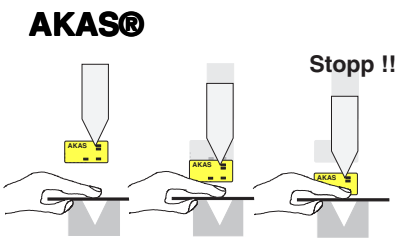
Saftey light grid with muting function



Proximity scanner



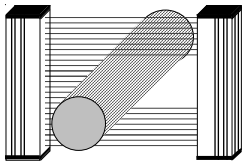
Safety mats



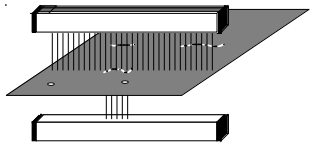
Press brake safety system

Safety foot pedal

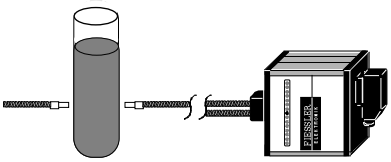
Safety PLC
Safety controllers



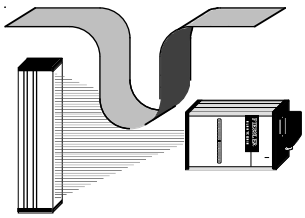
Measuring and controlling light curtains



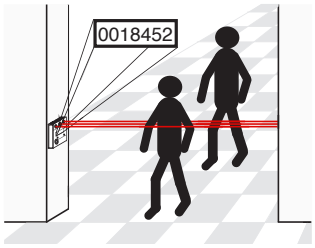
Hole detectors



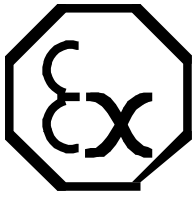
Turbidity sensors

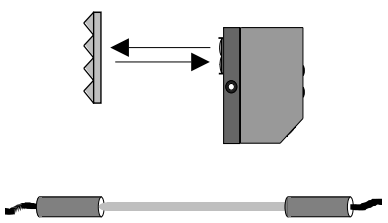


Analogue loop sensors



Counting light barriers





Light barriers for general purposes

Your application

page

Safety sensors

Contents (Safety - operating instructions)

Operating instructions --> (documentation available in the form of a CD) **N**

Type 4 Safety-light barrier / curtain (selection table)
Safety light curtains, Safety light grids ULVT, BLVT
Compact Safety light curtains ULCT, BLCT
2-beam safety light ULVT 500/2R
4-beam safety light ULVT 1200/4R
Single beam light barrier EU2K

Typ 2 Safety-light barrier / curtain (selection table)
Safety light curtains, Safety light grids TLVT, ILVT
Compact Safety light curtains TLCT, ILCT

Typ 4 Safety controller
Plug-on safety controller for the light curtain / light grid PLSG
Compact safety controller PLSG K
Programmable Safety Centre FPSC

Press brake safety system
Press brake safety system AKAS®

Additional operating instructions are available on demand
or
can be downloaded under

www.fiessler.de

page

Safety-Service

Index (Safety - service) **O**
O 1

-Application consulting

-Support during risk analysis

-Technical support

-Support for the integration in the machine control system

-Schematics editing

-Standard-compliant safety audits
- Safety review before the first commissioning
- Annual safety inspections
- Overrun measuring
- General machine safety inspections

-Modernisation of machines
- Retrofit of safety systems

-Safety training
- Safety seminars
- In-House Safety seminars at the customer's premises
- Application training
- Customized training

-Product training
- Safety light grid
- Safety controller
- Press brake safety
- ....

You'll find the latest training date on

www.fiessler.de

Please use our large download possibilities.

Attendances

The added value for our customers

- Application consulting service
- Assistance for the risk analysis
- Support for the integration in the machine control system
- Technical support and reworking of the wiring diagrams
- Safety inspections according to the applicable standards
- Modernising of facilities
- Safety and product training

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

ZERT DIN EN ISO 9001 Reg.Nr. 96007

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

Our Experience --> for your safety

Application consulting: For the implementation of your system and their safety, our safety experts will be happy to advise you on spot.
For your advice please contact our telephone application consulting engineers or call for one of our sales representatives.

Support for Risk analysis The European Machinery Directive regulates by law:
Machines can only put into circulation and into operation if the machines comply with the basic health and safety regulations and do not endanger the health or safety of any persons.
If you are a machine manufacturer or an end user we support you in assessing the potential risk and identifying the necessary safety category in order to safeguard your equipement according to the applicable laws and standards.
-> risk analysis of the machine -> appropriate risk prevention activities

Technical support: Our competent staff supports you with all the questions related with our products and its integration.

Schematic diagram editing: For the integration of Fiessler safety products, we support you by checking your wiring diagrams for the accurate intergration and safety classification.

Our Experience --> for your safety

Safety test confroming to standards

e.g. - Safety test before the first start-up

- use of the safety system according to standards
- integration into the machine control
- interworking of the safety system and the machine control
- calculation of the necessary safety distance to the point of danger
- generate an inspection record
- issue a test seal

- Yearly safety test

- verification of the proper function of the safety system
- review the components of the safety system
- verification of integration of the safety system
- verification of the proper installation of the safety system
- review of the necessary safety distance to the point of danger
- generate an inspection record
- issue a test seal

- Overrun measurement

- Other safety checks

Modernization of facilities

- Reftrofitting of safety devices with a following safety check

Our Experience --> for your safety

Safety training

e.g. - Safety seminars

- the European machine directive
- Yearly safety test for safety light curtain
- Safety check for safety control systems
- Safety for press brakes

- Safety seminars at customer's premises

- Application traing

- Customised training

Product-training

e.g. - Safety light curtain

- Safety control system, safety PLC

- Technical application training for safety light curtain,-grid

- AKAS - integration training

- FPSC - integration training

Sales agencies - Germany

Office south west	**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.bavaria@fiessler.de**

Sales agencies - world wide

World wide	**see www.fiessler.de**

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page

Controlling, detecting and measuring, conveyor technique

Index (Controlling, detecting and measuring, conveyor technique) **P**

-Controlling, detecting and measuring, conveyor technique

Hole-Detector GLSL P 1
Loop-Detector GSD II P 2
CCD-Loop detector for wires and hoses P 3
Area sensor for controlling and counting SLVT P 4
Scanning light curtain MLVT P 5
Multi-features light barrier MFL P 6
Reflex- and Muting- light barrier GR P 7
Encoding strips for the conveyor technique P 8

-Human Machine Interface **Q**
HMI Q 1

-Person counting light barrier **R**
Direction-controlled counting light barrier RAZL 6 R 1

The latest information are available on

www.fiessler.de

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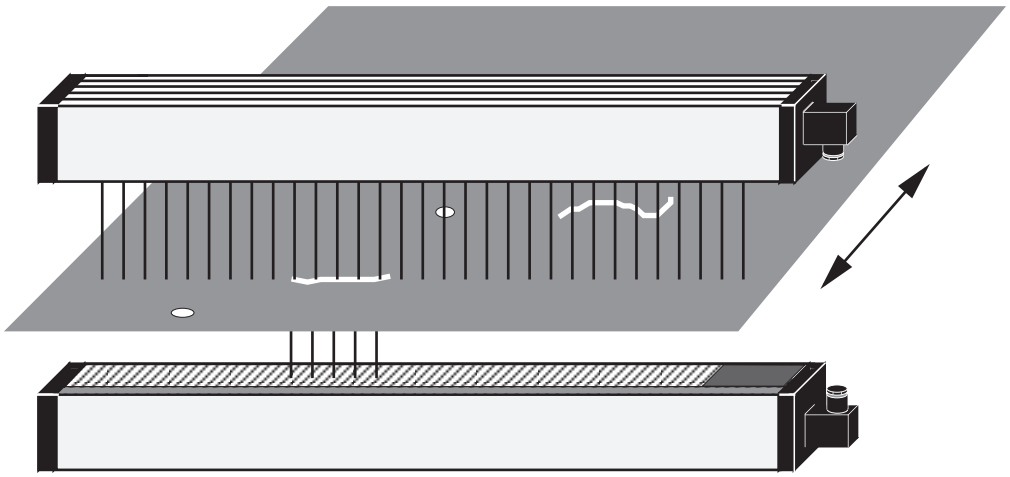
FIESSLER ELEKTRONIK

Technical Manual

Hole-Detector GLSL



recognition of

holes

chinks

defective spots

Recognition of holes > 1mm

Control field up to 2,8m

Sensitivity adjustable

Compact design

High scanning speed

ZERT
DIN EN ISO 9001
Reg.Nr. 96007

CE

Fiessler Elektronik Kastellstr. 9
D-73734 Esslingen

Telefon: 0711 / 91 96 97-0 Internet: http://www.fiessler.de
Telefax: 0711 / 91 96 97-50 eMail: info@fiessler.de

Funktion:

Recognition of faults (holes, chinks) in metal- and plastic sheet, sheet stell band and paper web, veneer wood, etc.

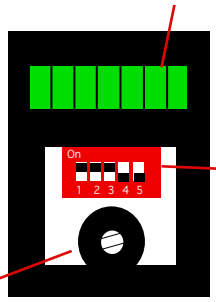
The device consists of the two components, light transmitter and light receiver.
The **transmitter** creates an invisible, modulated infrared light band.
The **receiver** consists of a number of optical modules, the signal amplifier and the integrating control unit.
The sensitifity is adjustable, therefore the device can recognize very small holes (≥1mm Ø). In the case of a hole, the out put transistor respectively the out put relay picks up and the LED "Loch erkannt" (hole recognized) lights up.

Adjustment possibilities:

receiver:

Covers unscrew around hole size and operating mode to select

Link only for external hole size adjustment



Dipswitch for operating mode adjustment

Potentiometer for adjustment of the hole size:

Turn in the clockwise direction: smaller hole size is detected
turn against clockwise direction: larger hole size is detected

Hole-Size:

The hole-size is adjustable between ≥1mm Ø up to 15 m Ø by the potentiometer " Lochgröße " (hole size). The setting range diminish by the increasing light transmitting capacity of the to be controlled material.

Mode Of Operation:

Static:

Impervious to light material:
The mode of operation "statistic" is used for material which is impervious to light.
The ouput switches if there are holes larger than the adjusted hole size. The examination will be also if there is a stop (stillstand) of the material.

Transparent material:
By using the mode of operation "statistic" for material which is transparent, there must be used another sensitivity for every change of the light transmitting capacity, for recognizing the same hole-size.

Application:

Dynamical material adaptation:

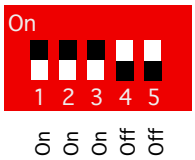
Transparent material:

This operation mode is **only** suited for transparent material.

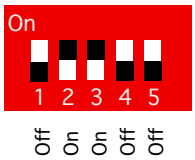
The device adapts itself automatically to the transparent material. Thereby the device recognize with the same adjusted hole-size the same size of holes also if the material has not the same light transmitting capacity (for example differnt kind of paper). The device messures and memorizes the light transmitting capacity of the moving material. This value is used like a reference for the sensitivity adjustment. Important by using this mode of operation is the movemnet of the to be controlled material. There is not examination by stillstand!

intern hole size selection active:

static operating mode

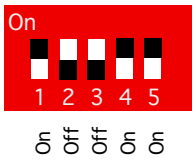


dynamic operating mode

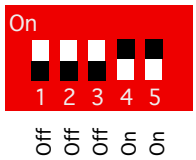


external hole size selection active:

static operating mode



dynamic operating mode



Rating :

	Light Transmitter	Light Receiver	
		Transitor Output	Relay Output
Supply Voltage	24V DC stabilized	24V DC stabilized	
Power Consumption Depending On The Lenght Of Installation	100 mA - 1,4 A	50 mA - 200 mA	
Light Source	GaAlAs, infrared, 36 kHz	--	--
Output	--	NPN / PNP max. 100 mA short circuit proof *1	Relay 2 A/ 50 V, ind. free 0,2 s fall delay time
Response Time	--	ca. 1ms	ca. 10ms
Enclosure Rating	IP 51 (opional IP 65)		
Ambient Temperature	-10to +50 °C		

*1 by the plug-on relay extension LSRA (in the delivery program of the company Fiessler electronics) is at any time possible a modification of the outputs of transistor on relay output.

Band Speed:

The max. band speed depends on the min. hole-size.

The sensitivity takes off with increasing band speed. Band speeds are possible till about 30 m/s.

Fiessler Elektronik Kastellstr. 9
D-73734 Esslingen

Telefon: 0711 / 91 96 97-0 Internet: http://www.fiessler.de
Telefax: 0711 / 91 96 97-50 eMail: info@fiessler.de

Output:

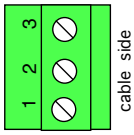
The standard type provides with transistor output (PNP and NPN). A relay output is optional available. The type with transistor output has a rise time of abou 1 ms. The type with relay output has a fall-delay time of about 200 ms.

Installation:

Movable key blocks on the backside of the housing enable a flexible installation.
The housings must be installed plane-paralle in a distance of about 50-100mm. Please observe that the profile remains untwisted.
The to be controlled material should be in the middle between transmitter and receiver.
The band has to cover the complete light field. On both sides the band must be 15 mm wider than the light field itself. If the band is smaller, the free space of the receiver must be covered.

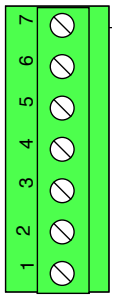
Connection Diagram:

Transmitter



: ----
: 0 V
: +24 V DC stab.

Receiver

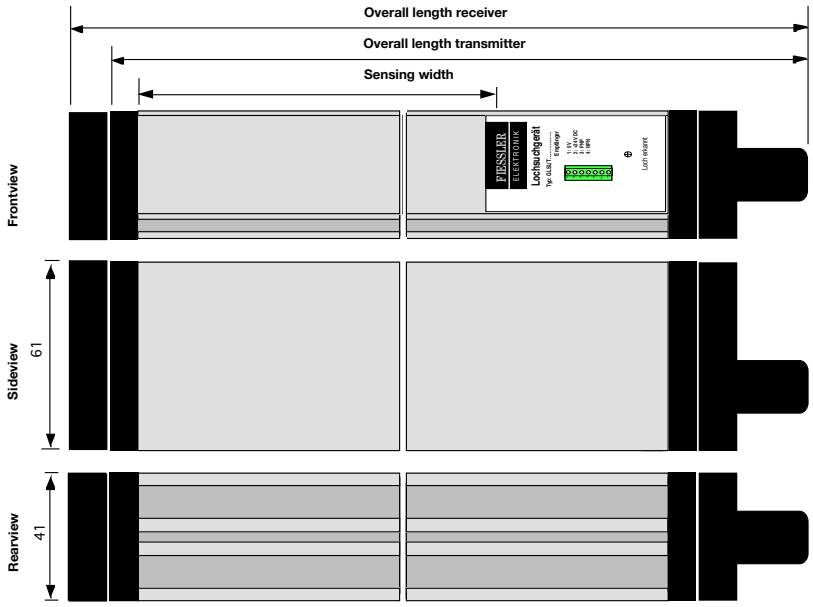


	Transistor output	Relay Output
	: +24 V DC stab.	: +24 V DC stab.
	: 0 V	: 0 V
	: NPN	: ---
	: PNP	: ---
	: ---	:
	: ---	:
	: ---	:

Size:

Type	Sensing Width mm	Overall length transmitter mm	Overall length receiver mm
GLSL 200	200	321	338
GLSL 400	400	521	538
GLSL 600	600	721	738
GLSL 800	800	921	938
GLSL 1000	1000	1121	1138
GLSL 1200	1200	1321	1338
GLSL 1400	1400	1521	1538
GLSL 1600	1600	1721	1738
GLSL 1800	1800	1921	1938
GLSL 2000	2000	2121	2138
GLSL 2200	2200	2321	2338
GLSL 2400	2400	2521	2538
GLSL 2600	2600	2721	2738
GLSL 2800	2800	2921	2938

Dimensions:



Fiessler Elektronik Kastellstr. 9
D-73734 Esslingen
Telefon: 0711 / 91 96 97-0 Internet: http://www.fiessler.de
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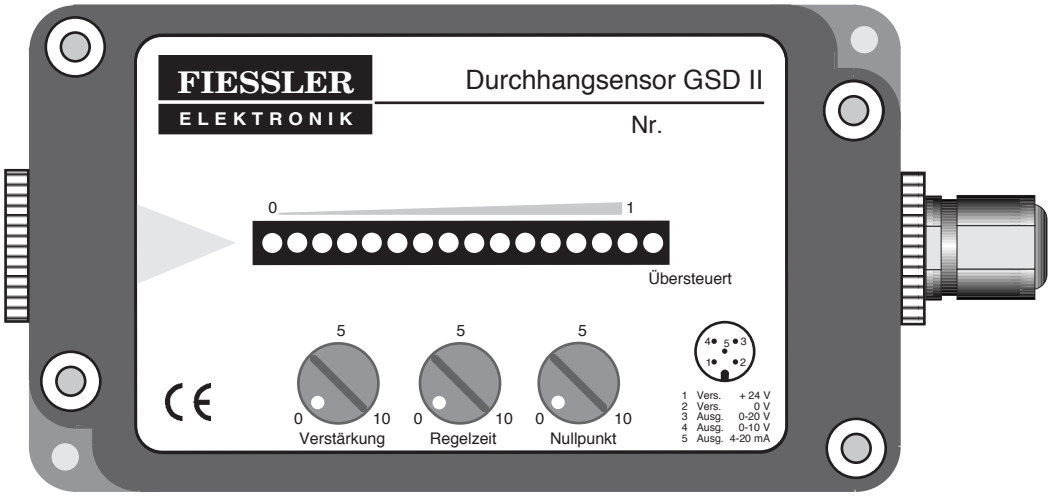
Analogue Loop-Detector GSD II



The sensor measures the loop of a band-shaped material and provides an analogue output signal proportional to the covering.

Contactless, optoelectronic measurement principle

Visual readout of measurement provided by a row of LEDs

Secondary-light-proof provided by alternating light mode

Adjustable amplification, delay and zero-point

Integrated inverter

Detection Range up to 4 m

Plug-in connection

Compact housing

DIN EN ISO 9001
Reg.Nr. 96007

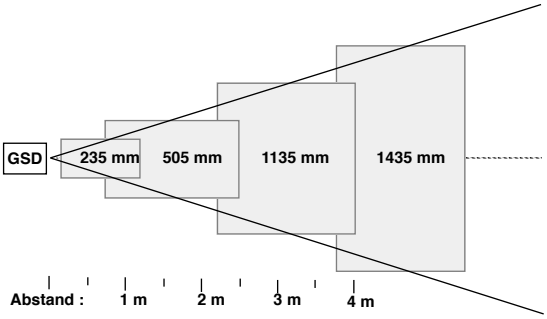
Application:

Detection of the loops in a tape-shaped material.
Loop control systems are used as a speed control for two or more machines that are installed in a row.

For keeping constant the loop of a band-shaped material, using a dual-mode control is not effective enough.
The analogue loop-detector transmits an input signal to the variable speed drive. Therefore, a constant loop control and loop shape is enabled.
The analogue loop-detector measures the loop of a belt material. The signal provided is proportional to the covering of the belt material.

Transmitter:

The analogue loop-detector consists of the two components light transmitter and receiver.
The transmitter is available in two different models:
a) with a fluorescent tube for visible light.
b) with infrared emitting diodes (LED) for invisible infrared light.
The transmitter generates an invisible infrared light band through the LEDs.



standard values for the detemination of the transmitter length

The length (L) of the transmitter depends on the distance between receiver and transmitter. Using the graphic above, the required transmitter-length can be determined.

Receiver:

The receiver-optic displays the lightband of the transmitter on the photodetector and generates an output-signal which is proportional to the covering of the transmitter (see table). The receiver evaluates only the alternating light mode of the transmitter. Therefore the analogue loop-detector GSDII is secondary-light-proof. The measuring signal is visualized by a row of LEDs.

	transmitter		
	free	partially covered	covered
Ausgang (0 - 20 V)	20 V	10 V	0 V
Ausgang (0 - 10V)	10 V	5 V	0 V
Ausgang (4 - 20 mA)	20 mA	12 mA	4 mA

Technical data:

range:	0,5 m - 4 m
supply voltage:	24 VDC stabilized (separate power supply for GSDII only)
power consumption:	approx. 80 mA
output voltage:	0 - 20 V ; 0 - 10 V
output current:	4 - 20 mA
adjusting possibilities:	amplification, recovery time 0 - 500 ms, zero-point adjustment
enclosure rating:	optional: IP 64
ambient temperature:	0 ° C to + 50 ° C
connection:	plug-type connector with screws

Power supply:

The following power supply is available:
NG 300: 24 V DC stabilized, max 300 mA

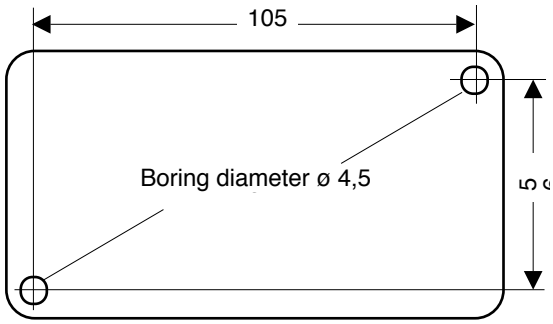
Option:

For an optimum adaptation to the different operating conditions, special designs are possible and available on request. With low expenditure, ranges, enclosure ratings and output voltages can be changed according to your requirement.

Mechanical adjustment:

Adjust transmitter and receiver in a way that both are located on the same center axis.

Mounting:



Connection:

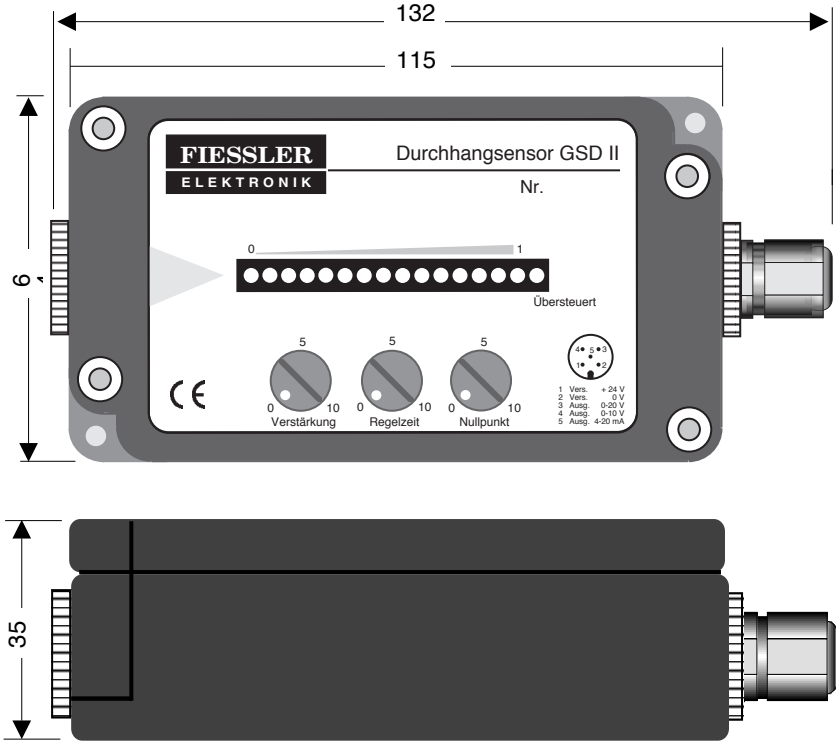
The connection must be made according to the diagram which is printed on the GSDII front panel.

1	=	+ 24 V DC stab.	=	brown
2	=	0 V	=	white
3	=	output 0 - 20 V	=	blue
4	=	output 0 - 10 V	=	black
5	=	output 4 - 20 mA	=	grey

Electric adjustment:

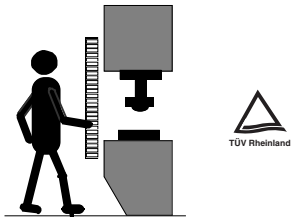
The amplification of the unit is adjusted with the amplification potentiometer ("Verstärkung"). However, make sure that the adjustment is low enough that the red LED (overshoot indicator) does not light up. If this is the case, the output voltage would exceed the maximum value of 20 V, causing an amplifier overshoot. Usually, the output voltage must be set to 20 V after having executed a precise alignment of the measuring device. Make sure that any covering of the detection devices is excluded. (UA = 20 V when output 0 - 20V is used.)
With the zero-point potentiometer ("Nullpunkt") the output voltage value is increased. In this case, the amplifier has a voltage at its output, although no signal is present. This compensation voltage is used for matching variable speed actutators whose stationary state is not obtained in the centre (10 V) of the control voltage range available of 0 - 20 V. This compensating voltage is infinitely variable from 0 - 20 V.
To obtain an optimum matching, a time constant that is adjustable from 0 to 500 ms using the recovery time protentiometer ("Regelverzögerung") is provided within the receiver.
In additon, as an adjustment aid, the receiver incorporates a row of LEDs; the nature of the light change is clearly apparent from their direction of indication.

Dimensions:

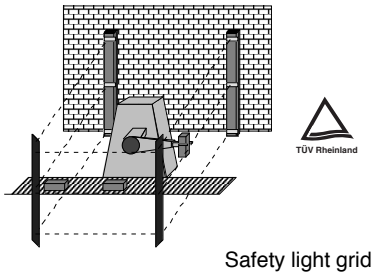


Delivery program

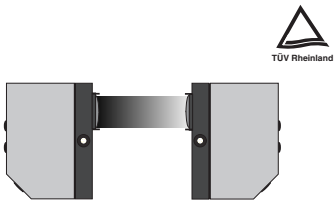
Fiessler Elektronik
Kastellstr. 9 D-73734 Esslingen
Telefon: 0711 / 91 96 97-0
Telefax: 0711 / 91 96 97-50
WWW.fiessler.de
E-Mail:info@fiessler.de



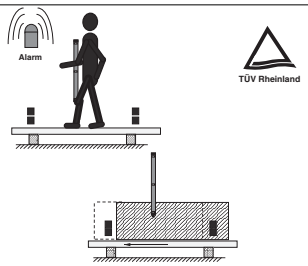
Safety light curtain



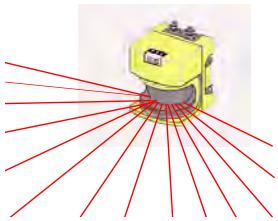
Safety light grid



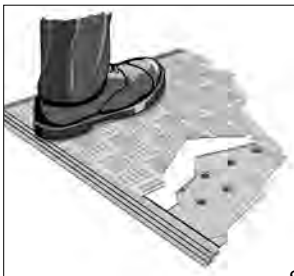
Single safety light beam



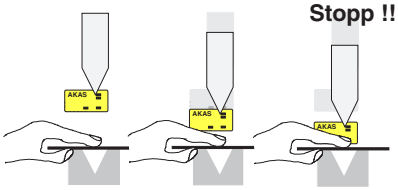
Safety light grid with muting function



Proximity scanner



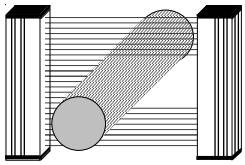
Safety mats



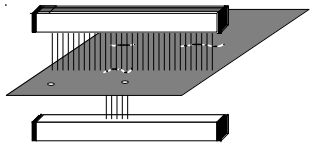
Press brake safety system

Safety foot pedal

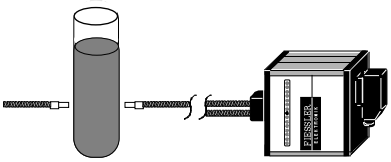
Safety PLC
Safety controllers



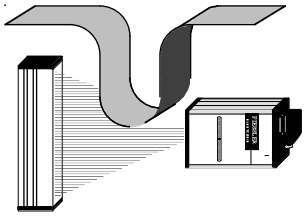
Measuring and controlling light curtains



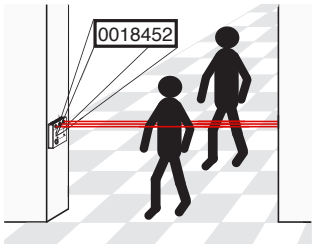
Hole detectors



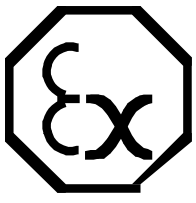
Turbidity sensors

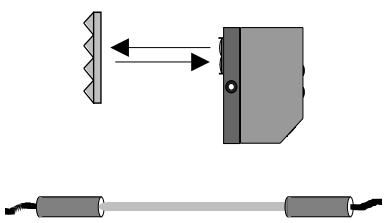


Analogue loop sensors



Counting light barriers





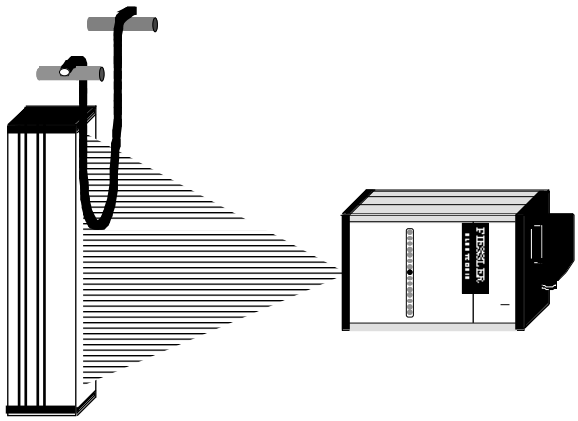
Light barriers for general purposes

Your application

CCD Loop detector

for wires and tubes

The CCD-sensor measures the position of a wire or a hose within a measuring field and provides an analogue output signal of 0 - 20 V.



Detection of wires starting from 0.3 mm Ø

Contactless, optoelectronic measurement principle

High accuracy by CCD - line

Visual readout of measurements provided by a row of LEDs

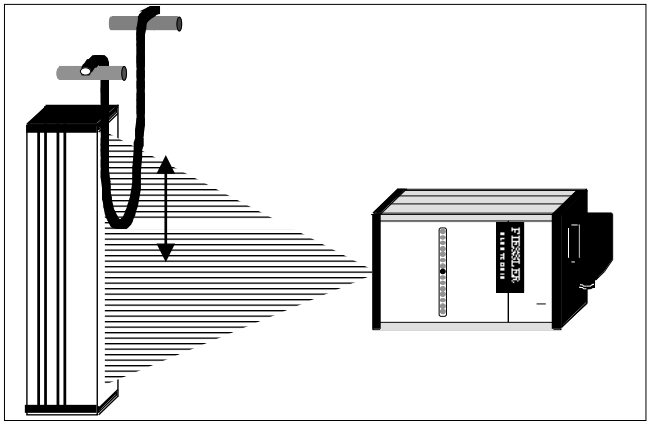
Automatic contrast alignment

Universal fastening by tenon blocks

DIN EN ISO 9001
Reg.Nr. 96007

Application:

Loop control systems are used as a speed control for two or more machines that are installed in a row.
For keeping constant the loop of a wire or a hose, very frequently a dual-mode control is not sufficient.
The analogue loop-detector transmits an input signal to the variable speed drive. Therefore, a constant loop control and loop shape is enabled. The analogue loop-detector measures the loop of a wire or hose. The signal provided is proportional to the position of the wire or hose. By this, a constant constant loop shape is enabled.



CCD - tramsmitter:

The light transmitter is equipped with high frequency operated, fluorescent tube for producing a homogeneous light field.

CCD - receiver:

The receiver-optic displays the lightband of the transmitter on a CCD line with 2048 elements. These elements are periodically queried. If no object is present within the measuring field, all elements are lit up. The output voltage is 0 V. If one or several of these receiver diodes is blocked by an object, the circuit detects which of the diodes do not receive light. The output supplies an output voltage of 0 - 20 V according to the situation of this shading.
The upper edge of the wire is the determining factor. The measuring signal is visualized by a row of LEDs.

Control unit:

The following power supply is available :

NG 300: 24 V DC stabilized, max 300 mA

Technical data:

Distance (transmitter - receiver)	**Transmitter type**	**Hight of measuring field**	**max. resolution (wire Ø)**
100 mm	CCD - S 235	65 mm	0,3 mm
200 mm	CCD - S 235	125 mm	0,6 mm
400 mm	CCD - S 355	250 mm	1,2 mm
600 mm	CCD - S 505	385 mm	1,8 mm
800 mm	CCD - S 685	490 mm	2,5 mm
1000 mm	CCD - S 895	615 mm	3,0 mm
The highest resolution with full measuring field height is reached, if the wire is placed directly in front of the light transmitter.			

	CCD - D - receiver		**CCD - transmitter:**
Supply voltage:	24 V DC stabilized		230 V AC ± 5 %
Power consumption:	ca. 100 mA		ca. 200 mA
Output voltage:	0 - 20 V		- - - - - - - -
Ambient temperature:	- 10°C bis 50°C		- 10°C bis 50°C
Connection:	plug-type connector with screws		
Housing:	Aluprofile, anodized with plastic screens		

For an optimum adaptation to the different operating conditions, special designs are possible and available on request. With low expenditure, ranges, enclosure ratings and output voltages can be changed according to your requirement.

Connection:

The connection must be made according to the diagram which is printed on the CCD-D receiver front panel.
The symbols have the following meanings:

connector CCD - D - receiver

1	=	**(-)**
2	=	PE
3	=	**+ 24 V DC stab.**
4	=	free
5	=	**output (0 - 20 V)**
6	=	free
7	=	free

connector CCD - transmitter

1	=	**L1 230 V AC ± 5 %**
2	=	**N**
⏚	=	**PE**

Mechanical adjustment:

Adjust the transmitter and receiver in a way that both are located plane-parallel on the same center axis, and that they are mounted with the correct distance to each other.

Transmitter and receiver are equipped with tenon blocks and mounting plates. The mounting plates are slidaböle and can be mounted on three sides of the housing.

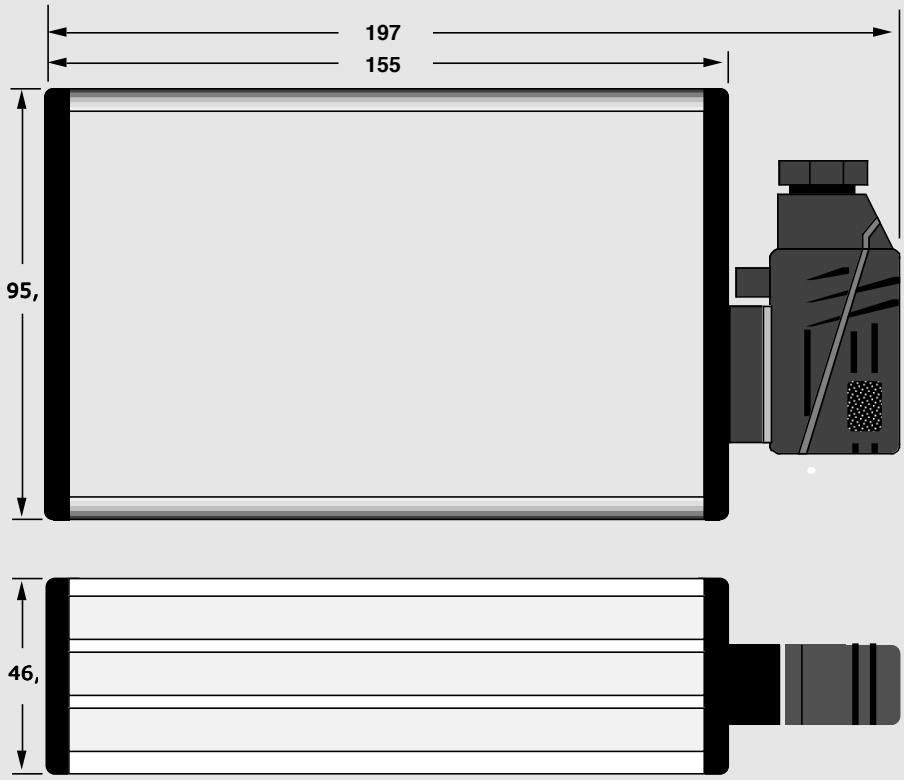
Electric adjustment:

To adjust the receiver a digital voltmeter has to be connected between terminals 1 and 5.

The receiver has to be aligned in a way that in the LED row only the 0V LED lights up and the digital voltmeter indicates an output voltage of approx. 0.05 V DC.

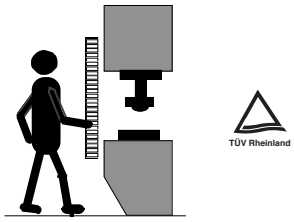
The transmitter should be switched on approx. 2 min. prior to the start of the adjustment, as otherwise no homogeneous light field is produced.

Dimensions:

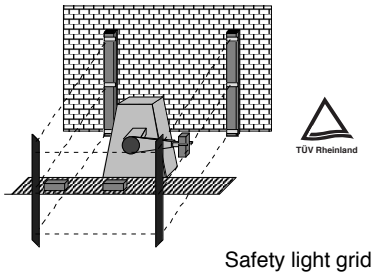


Delivery program

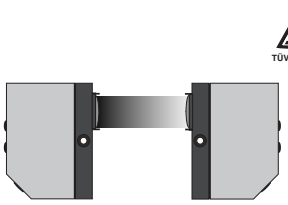
Fiessler Elektronik
Kastellstr. 9 D-73734 Esslingen
Telefon: 0711 / 91 96 97-0
Telefax: 0711 / 91 96 97-50
WWW.fiessler.de
E-Mail:info@fiessler.de



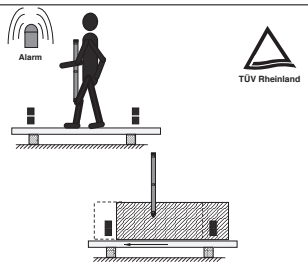
Safety light curtain



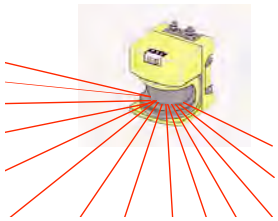
Safety light grid



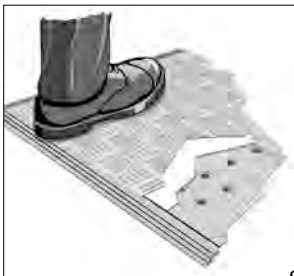
Single safety light beam



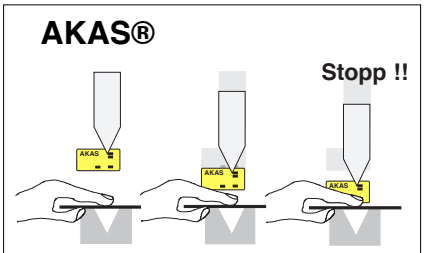
Saftey light grid with muting function



Proximity scanner



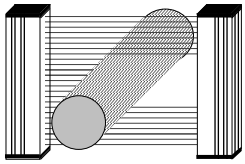
Safety mats



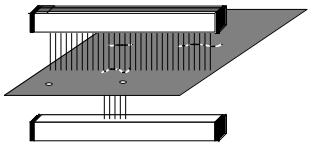
Press brake safety system

Safety foot pedal

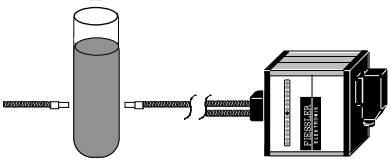
Safety PLC
Safety controllers



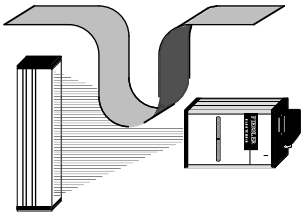
Measuring and controlling light curtains



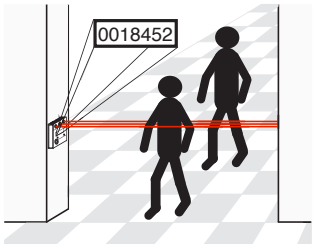
Hole detectors



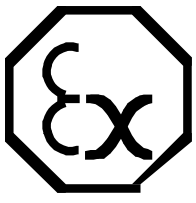
Turbidity sensors

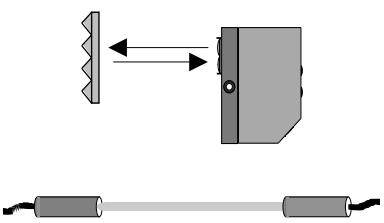


Analogue loop sensors



Counting light barriers



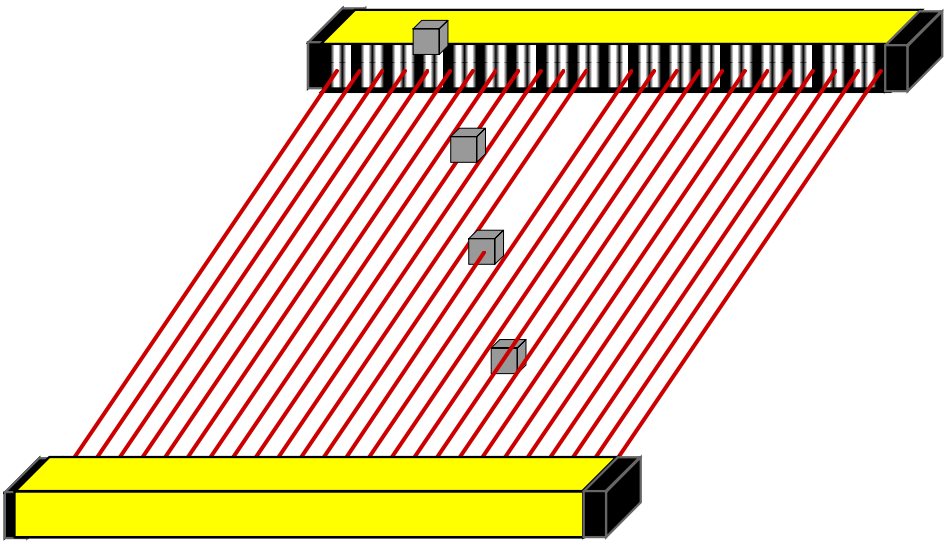


Light barriers for general purposes

Your application

Area Sensor for controlling and counting

SLVT



Beam spacing 7,5mm (0,29 in.)

Sensor range up to 1,9 m x 24 m

Scan length in 100 mm (3,94 in.) steps

Short response time from 1,0 ms, depending on scan length

DIN EN ISO 9001
Reg.Nr. 96007

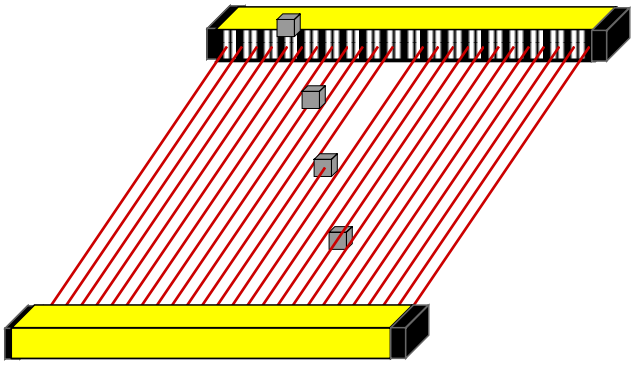
Application:

The SLVT Area Sensors for controlling and counting are used for the detection of small objects (≥ 7,5 mm) in a sensor field of up to 1,9m x 7 m.

Applications of the SLVT are:

- **for counting falling parts from unspecified positions in wide areas**
- **suspended trolleys**
- **paint shops**

For shape classification or for measuring of objects, the SLVT series with serial interface are available. With this interface, the current state of every single beam can be verified.



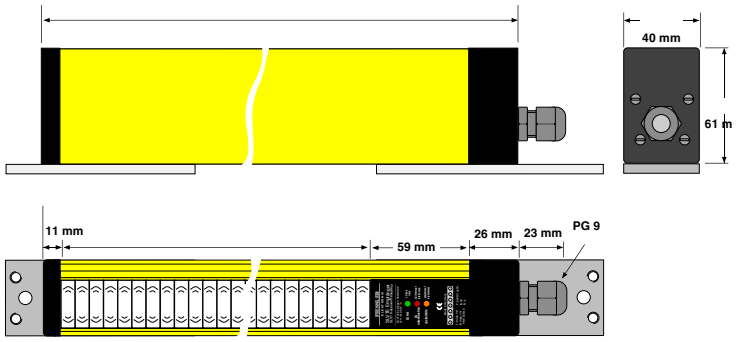
application example: ejection control

Features

The Area Sensors for controlling and counting SLVT are characterized by the following features:

- smallest object detection (7,5/14mm)
- **short response times**
only 1,0 ms up to 10,3 ms, depending on length
- scanning lengths 100 mm up to 1900 mm
in steps of 100 mm
- **directly connectable small guards / valves,**
2 short-circuit-safe non-equivalent semiconductor outputs, PNP, connecting capacity 0,5A/24V
- protective system IP 65
- operating range 7m with resolution 14 mm
- operating range 24 m with resolution 30 mm

Dimensions



Construction

The system SLVT consists of two components: transmitter and receiver. Their detection ranges and -heights are defined by the distance between both transmitter and receiver and by their constructional lengths.

Due to the Modular design of the components, sensor field heights from 100 mm through 1900 mm are available. On demand, the construction of special dimensions units for intermediate-sized applications is possible.

Function

The transmitter generates infrared light beams which are continuously flashing at high speed. The parallel light beams (beam spacing 7,5mm) are evaluated in the receiver in synchronous action with the transmitter. The beam spacing of 7,5mm provides a resolution of 14 mm.

If an object with a diameter of ≥ 14 mm is placed into the detection field, i.e. at least one of the light beams is interrupted, both receiver outputs are activated.

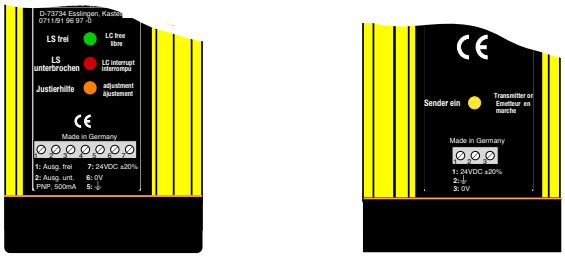
		Beam space 7,5 mm		Beam space 14 mm	
scanning lengths (mm)	overall length (mm)	**order code** range 7 m	* response time in ms	**order code** range 24 m	* response time in ms
100	196	**SLVT100 / 13**	1,2	**SLVT100 / 7**	1
200	296	**SLVT200 / 26**	1,7	**SLVT200 / 14**	1,3
300	396	**SLVT300 / 39**	2,2	**SLVT300 / 21**	1,6
400	496	**SLVT400 / 52**	2,7	**SLVT400 / 28**	1,8
500	596	**SLVT500 / 65**	3,2	**SLVT500 / 35**	2
600	696	**SLVT600 / 78**	3,7	**SLVT600 / 42**	2,4
700	796	**SLVT700 / 91**	4,2	**SLVT700 / 47**	2,7
800	896	**SLVT800 / 104**	4,7	**SLVT800 / 56**	2,9
900	996	**SLVT900 / 117**	5,2	**SLVT900 / 63**	3,2
1000	1096	**SLVT1000 / 130**	5,7	**SLVT1000 / 70**	3,5
1100	1196	**SLVT1100 / 143**	6,2	**SLVT1100 / 77**	3,8
1200	1296	**SLVT1200 / 156**	6,7	**SLVT1200 / 84**	4
1300	1396	**SLVT1300 / 169**	7,2	**SLVT1300 / 91**	4,3
1400	1496	**SLVT1400 / 182**	7,8	**SLVT1400 / 98**	4,6
1500	1596	**SLVT1500 / 195**	8,3	**SLVT1500 / 105**	4,8
1600	1696	**SLVT1600 / 208**	8,8	**SLVT1600 / 112**	5,1
1700	1796	**SLVT1700 / 221**	9,3	**SLVT1700 / 119**	5,4
1800	1896	**SLVT1800 / 234**	9,8	**SLVT1800 / 126**	5,7
1900	1996	**SLVT1900 / 247**	10,3	**SLVT1900 / 133**	5,9

* max. detection and reaction time = Minimum sojourn time of the object in the sensor field until the reaction of outputs.

LED-displays

The respective operational mode is indicated by several LEDs on the receiver front plate. Therefore, any interruption of the sensor area, or any dirt or faulty adjustment of the transmitter/or receiver can be easily detected.

After switching on the system, both transmitter and receiver must be adjusted in a way that the green LED "free" lights up and the red LED "off" does not light up when the sensor area is free. In order to guarantee sufficient reserve, the orange LED "alignment gear" should not light up.

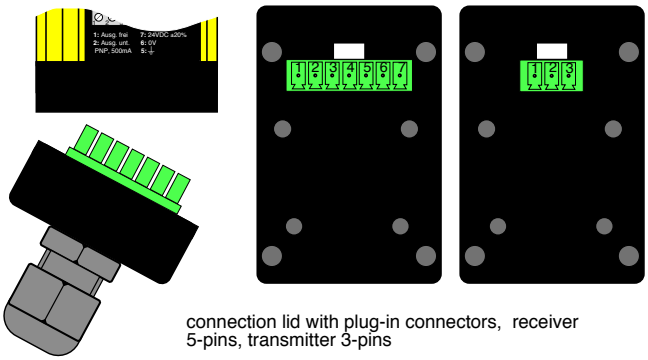


Integrated plug-in connection in the connection cap

The standard of the product series SLVT includes an extra flat plug-in connection located in the connection lid. This lid may be removed without cutting the connection cable plug. The housing itself remains tightly closed.

Various standard connection plugs are availabe to the customer.

The connection of the transmitter is realized by a 3-pin cable, the receiver by a 5-pin cable.



connection lid with plug-in connectors, receiver 5-pins, transmitter 3-pins

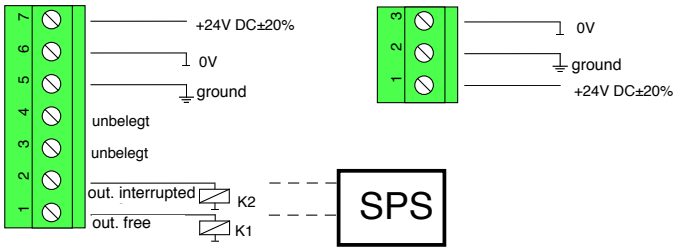
Connection

The connection is made following the diagrams at the right hand side. The antivalent PNP-ports are short-circuit-safe and can be connected and evaluated independently from each other.

The switching capacity of 0,5A/24V permits the direct connection of small guards, relays or SPS.

If the sensor field is free, the PNP port "free" is conducting and the PNP port "interrupted" is not conducting.

If the sensor field is interrupted, the SPS port "interrupted" is conducting and the PNP port "free" is not conducting.

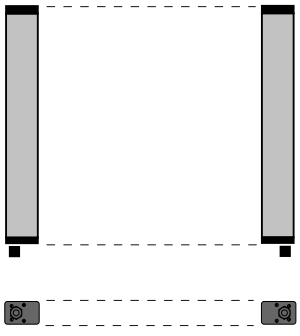


Mounting transmitter and receiver

Please make sure that the plugs of both transmitter and receiver are located at the same side of the units. They have to be aligned parallel to each other.

In order to swivel around the longitudinal axis: turn one single adjustment screw on one fastening bracket, while loosening both adjustment screws on the other bracket.

In order to swivel around the lateral axis: turn both adjustment screw evenly on one fastening bracket, while loosening both screws on the other bracket.

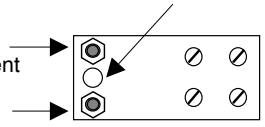


longitudinal axis

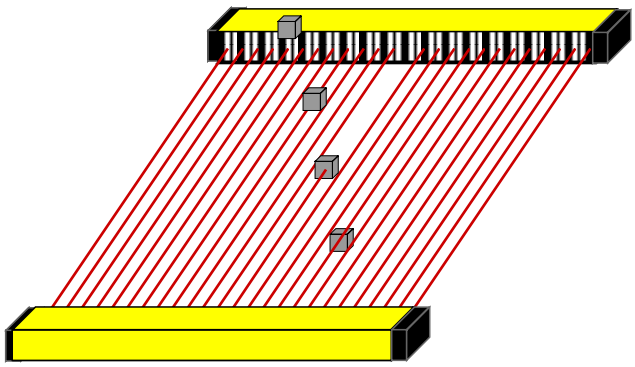
lateral axis

7 mm diameter hole for fastening

adjustment screws with lock nuts for swivel movement around longitudinal / lateral axis

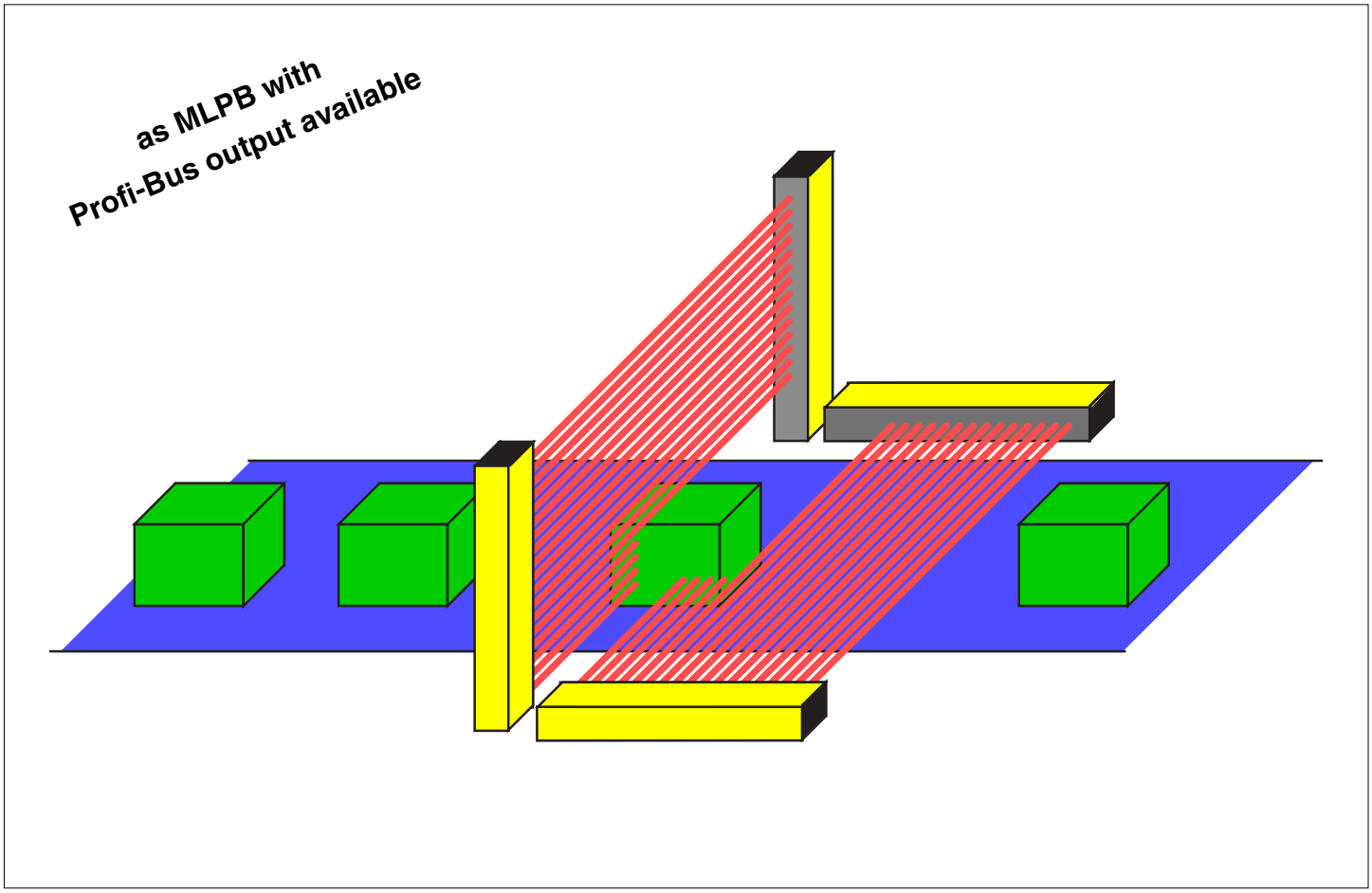


Characteristics	SLVTS... / SLVTE...	
Sensor field heights	100 mm ... 1900 mm (according to number of beams)	
Sensor field widths (range)	0,1... 7 m	
Contructional lengths	196 mm ... 1996 mm (according to number of beams)	
Definition	detection of smallest beam space 7,5mm	
Number of beams	13... 247 beams	
Detection/reaction time	max. detection and reaction time = Minimum sojourn time of the object in the detection field until the reaction of outputs: see table on page 2	
Mechanical data		
Housing design	Aluminum-profile, plastic laminated RAL 1020 yellow, end pieces consist of acidproof synthetic (Polyamide) reinforced by glass globes. Light ermerging and detection areas made from plexiglass, optional solventproof silikate glass.	
Attachment	Adjustable fixing link on backof housing	
Weight	Transmitter: 0,45 kg up to 4,5 kg according to constructional height Receiver: 0,5 kg up to 5,0 kg according to constructional height	
Operating data		
Protective System	IP 65	
Protective class	III	
Temperature of operationa	between -10 and 55 °C	
Storing temperature	between -25 and 70 °C	
Electric data		
	Transmitter SLVTS	**Receiver SLVTE**
Power supply	24 V DC ±20 %	24 V DC ±20%,
Power consumption	max. 200 mA	max. 200 mA (at no charge)
Outputs (Receiver)	-	outputs"free" and "interrupted": PNP-outputs, short-circuit-safe, max. 0,5 A RS-485 (+) and (-)
Electrical connection	integrated plug-in connector with PG9 as traction relief. Alternative: custom made connection plugs	integrated plug-in connector with PG9 as traction relief. Alternative: custom made connection plugs
Cables	3-pin, max. 1,5 mm2	5-pin, max. 1,5 mm2



Scanning Light Curtain

MLVT



Parallel scanning - therefore no error of measurement

Sensor-Range up to 1,9 m x 7 m, beam spacing 7,5 mm (0,29 in.)

Scan length in 100 mm (3,94 in.) steps

High speed scanning, reaction time 1,2 ms

Serial Communications - SPS or IPC

Optional integrated Profibus-DP output

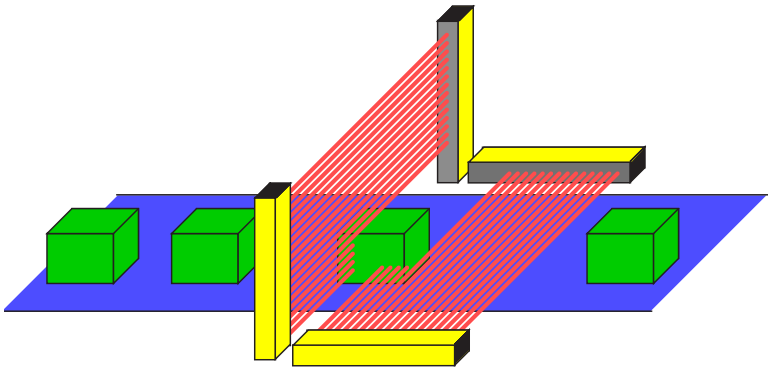
DIN EN ISO 9001
Reg.Nr. 96007

Application:

The scanning light curtain **MLVT** is used for measuring non-transparent objects.
Thanks to the parallel scanning method, there is no error of measurement.

With a beam spacing of 7,5 mm (0,29 in.) and a huge scanning field of max. 1900mm (74,80 in.) X 24m (944,88 in.) this light curtain can be used very flexibly for many applications.
Applications of the **MLVT** are:
Measurement of length, volume, holes, loops .....

paint shops - **controlling of the spray guns**
assembly lines - **assorting of cardboard boxes**
wood industries - **classification of tree circumferences**

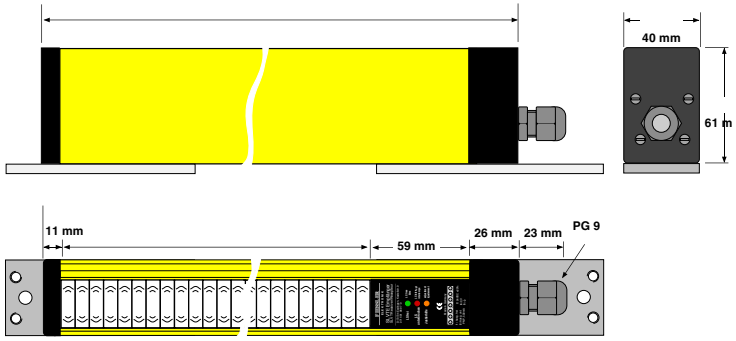


Measuring of box volumes

Features

The scanning light curtains MLVT are characterized by the following features:

- beamspacing only 7,5 mm (0,29 inch)
- **high speed scanning** only 1,2 ms up to 10,3 ms, depending on length
- scanning length 100 mm up to 1900 mm in steps of 100 mm
- **small guards / valves directly connectable**, 2 short-circuit-safe non-equivalent semiconductor outputs, PNP, connecting capacity 0,5A/24V
- **protective system IP 65**
- **operating range 7m (7,5mm beam space)**
- **operating range 24m (14mm beam space)**
- **Serial Communications (RS 458) for IPC or SPS** interface converter (optionally available as accessory)



Construction

The system MLVT consists of two components: transmitter and receiver. Their detection ranges and heights are defined by the distance between both transmitter and receiver and by their constructional lengths.
Due to the modular design of the components, there-are sensor field heights from 100 mm through 1900 mm availablabe. On demand, the construction of special dimensions units for intermediate-sized applications is possible.

Function

The transmitter generates infrared light beams which are continuously flashing at high speed. The parallel light beams (beam spacing 7,5mm) are evaluated in the receiver in synchronous action with the transmitter.
The diodes are checked one after the other whether all beams are free or if there is any obstacle. By doing this, a verification of the current status of all diodes is realized. Via a serial interface, these data can be processed further. If there is an object in the detection field, both receiver outputs are activated.

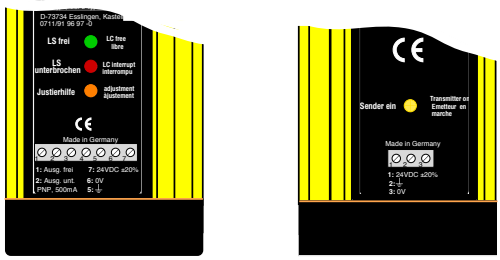
		beam space 7,5 mm		beams space14 mm	
sensor field heights/ no. of beams mm	over all-length mm	**Order no.** max range 7 m	* max. reac-tion time m/s	**Order no.** max. range 24 m	* max. reac-tion time m/s
100	196	**MLVT100 / 13**	1,2	**MLVT100 / 7**	1
200	296	**MLVT200 / 26**	1,7	**MLVT200 / 14**	1,3
300	396	**MLVT300 / 39**	2,2	**MLVT300 / 21**	1,6
400	496	**MLVT400 / 52**	2,7	**MLVT400 / 28**	1,8
500	596	**MLVT500 / 65**	3,2	**MLVT500 / 35**	2
600	696	**MLVT600 / 78**	3,7	**MLVT600 / 42**	2,4
700	796	**MLVT700 / 91**	4,2	**MLVT700 / 47**	2,7
800	896	**MLVT800 / 104**	4,7	**MLVT800 / 56**	2,9
900	996	**MLVT900 / 117**	5,2	**MLVT900 / 63**	3,2
1000	1096	**MLVT1000 / 130**	5,7	**MLVT1000 / 70**	3,5
1100	1196	**MLVT1100 / 143**	6,2	**MLVT1100 / 77**	3,8
1200	1296	**MLVT1200 / 156**	6,7	**MLVT1200 / 84**	4
1300	1396	**MLVT1300 / 169**	7,2	**MLVT1300 / 91**	4,3
1400	1496	**MLVT1400 / 182**	7,8	**MLVT1400 / 98**	4,6
1500	1596	**MLVT1500 / 195**	8,3	**MLVT1500 / 105**	4,8
1600	1696	**MLVT1600 / 208**	8,8	**MLVT1600 / 112**	5,1
1700	1796	**MLVT1700 / 221**	9,3	**MLVT1700 / 119**	5,4
1800	1896	**MLVT1800 / 234**	9,8	**MLVT1800 / 126**	5,7
1900	1996	**MLVT1900 / 247**	10,3	**MLVT1900 / 133**	5,9

* max. detection and reaction time = Minimum sojourn time of the object in the sensor field until the reaction of outputs.

communication

Serial RS-485 port, optional integrated profibus output. Simple and easy-to-handle connection to other communication devices. These scanning curtains can be optionally connected via an external converter to an RS 232 C-interface or to a profibus-DP field bus.

On reception of a demanding signal issued by the computer or by the SPS, the receiver emits the number of the darkened emitting diodes (or light beams) in binary code (polling). As demand signal, any byte issued from the PC or the SPS will suffice. The transmission Parameters are: 9600, N, 8, 1 (Baud, No Parity, Databits, Stopbit)
For special applications , the suitable software will be available on demand.

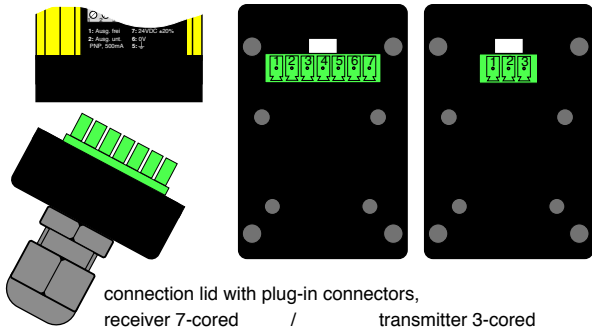


LED-displays

The respective operational mode is indicated by several LEDs on the receiver front plate. Therefore, any interruption of the sensor area, or any dirt or faulty adjustment of the transmitter/or receiver can be easily detected .
After switching on the system, both transmitter and receiver must be adjusted in a way that the green LED "free" lights up and the red LED "off" does not light up. In order to guarantee sufficient reserve, the orange LED "alignment gear" should not light up.

Integrated plug-in connection in the connection lid

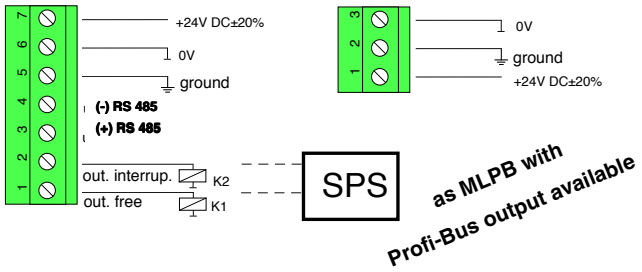
The standard of the product series MLVT includes an extra flat plug-in connection located in the connection lid. This lid may be removed without cutting the connection cable plug. The housing itself remains tightly closed.
There are various standard connection plugs availabe. The connection of the transmitter is realized by a 3-core cable, the receiver by a 7-core cable.



connection lid with plug-in connectors,
receiver 7-cored / transmitter 3-cored

Connection

The connection is made following the enclosed diagrams. The non-equivalent PNP-ports are short-circuit-safe and can be connected and evaluated independently from each other.
The switching capacity of 0,5A/24V permits the direct connection of small guards, relays or SPS.
If the sensor field is free, the PNP port "free" is conducting and the PNP port "interrupted" is not conducting.
If the sensor field is interrupted, the SPS port "interrupted" is conducting and the PNP port "free" is not conducting.
Serial port RS458: 2-core cable simplex connection
Connection 3 is A (+) connection 4 is B(-).

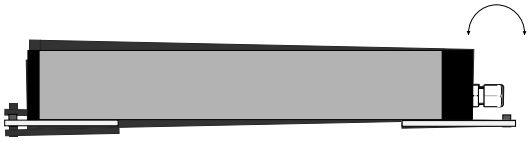


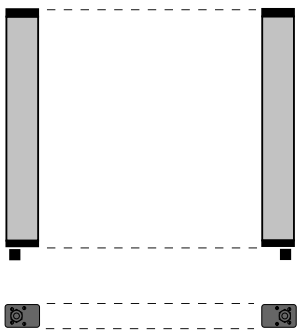
Mounting transmitter and receiver

Please make sure that the plugs of both transmitter and receiver are located at the same side of the units. They have to be aligned parallel to each other.
<u>In order to swivel around the longitudinal axis:</u> turn one single adjustment screw on one fastening clip, while loosening both adjustment screws on the other clip.
<u>In order to swivel around the lateral axis:</u> turn both adjustment screw evenly on one fastening clip, while loosening both screws on the other clip.

Longitudinal axis

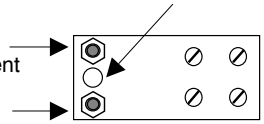
Lateral axis



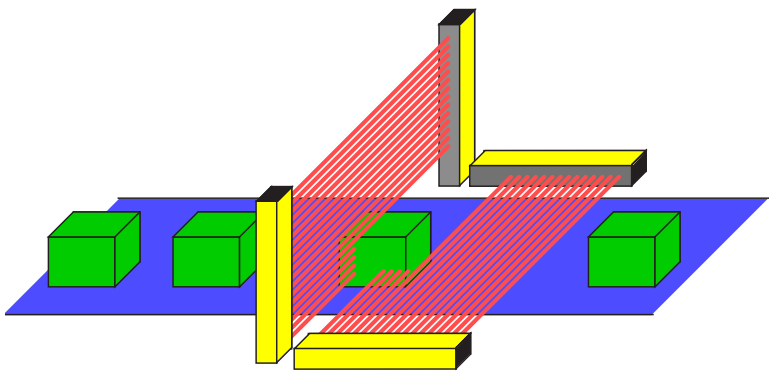


7 mm diameter hole for fastening

adjustment screws with lock nuts for swivel movement around longitudinal / lateral axis

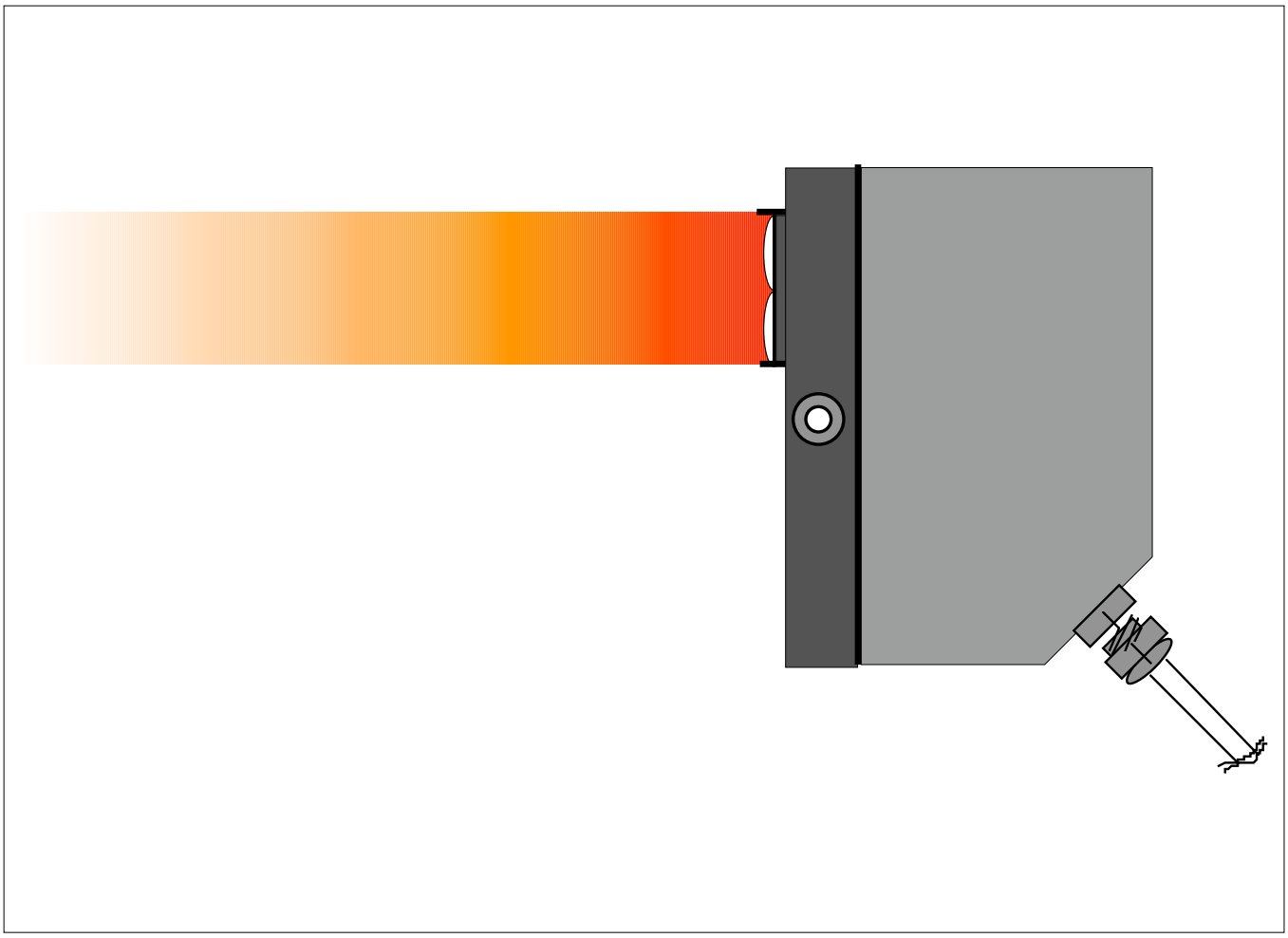


characteristic data	MLVTS... / MLVTE...	
sensor field heights	100 mm ... 1900 mm (according to number of beams)	
sensor field widths (range)	0,1... 7 m	
contructional lengths	196 mm ... 1996 mm (according to number of beams)	
definition	detection of smallest obstacles (14 mm)	
number of beams	13... 247 beams	
detection/reaction time	max. detection and reaction time = Minimum sojourn time of the object in the detection field until the reaction of outputs: see table on page 2	
Mechanical data		
Housing design	Aluminum-profile, plastic laminated RAL 1020 yellow, end pieces consist of acidproof synthetic (Polyamide) reinforced by glass globes. Light ermerging and detection areas made from plexiglass, optional solventproof silikate glass.	
attachment	Adjustable fixing link on backof housing	
weight	Transmitter: 0,45 kg up to 4,5 kg according to constructional height Receiver: 0,5 kg up to 5,0 kg according to constructional height	
Operating data		
Protective System	IP 65	
Protective class	III	
Temperature of operationa	between -10 and 55 °C	
Storing temperature	between -25 and 70 °C	
Electric data	**Transmitter MLVTS**	**Receiver MLVTE**
Voltage	24 V DC SELV, ±20 %	24 V DC SELV, ±20%,
Power consumption	max. 200 mA	max. 200 mA (at no charge)
Outputs (Receiver)	-	outputs"free" and "interrupted": PNP-outputs, short-circuit-safe, max. 0,5 A RS-485 (+) and (-)
Electrical connection	integrated plug-in connector with PG9 as traction relief. Alternative: custom made connection plugs	integrated plug-in connector with PG9 as traction relief. Alternative: custom made connection plugs
Cables	3-cored, max. 1,5 mm^2	5-cored, max. 1,5 mm^2



as MLPB with Profi-Bus output available

Multi-features light barrier MFL



Operation with reflecting and non-reflecting (diffuse) objects

0m - 15m range

Digitally adjustable releasing / closing dilatation of relay

Automatic adjustment

Immune to interferences

IP 65

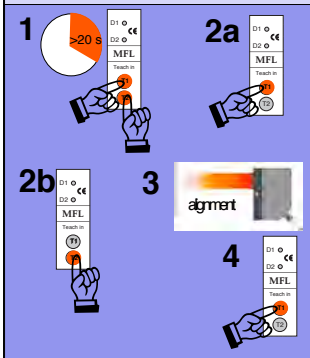
DIN EN ISO 9001
Reg.Nr. 96007

Application	MFL
	General purpose-reflex light barrier with extended detection range. For general applications like detecting, counting etc.

Description of function

The function of the reflex light barrier MFL is controlled by micro controller. This micro controller regulates all tasks like controlling of the infrared diode, evaluation of the receiver signal, interference blanking in case of faulty signals, and automatic adjustment to various detection ranges as well as the controlling of digitally adjustable releasing / closing dilatation of relay.

Adjustment



The MFL features automatical adjustment to the desired detection range. For entering the adjustment mode, both buttons T1 and T2 must be pressed down for more than 20 sec **(1)**. After 20 sec., all LEDs will darken. Now the button T1 for operation with reflecting objects **(2a)** or the button T2 for operation with non-reflecting (diffuse) objects has to be pressed **(2b)**. Consequently, the yellow LED D2 lights up and the status LED D1 lights up red. Now the light barrier may be adjusted until the respective object (e.g., the reflector) makes the LED turn green. **(3)** If the button T1 is pressed once more, the MFL will calculate an average value out of 10 measurings **(4)**. This value will be the reference value for all following measurements. Now the MFL is adjusted. This procedure may be repeated at random.

The MFL features an adjustable releasing / closing dilatation of relay. Deceleration range is 1 - 255 sec. in gradation steps of 1 sec or more. Each feature may be defined separately.

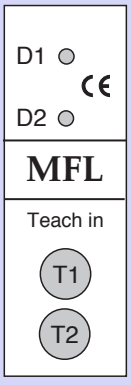
In order to program the closing dilatation of the relay, it is necessary to keep the button T1 pushed during operation. LED D2 lights up once per second. With every flashing, the time dilatation will increase by 1 second. After releasing of the button the resepective value is registered. Diverse registered values may be added by another push of this button. For programming the releasing dilatation of relay, it is necessary to execute the same procedure with the T2-button.

Reset of both dilatation periods will be executed when both buttons T1 and T2 are pushed simultaneously. When doing so, the LED D2 will flash once.

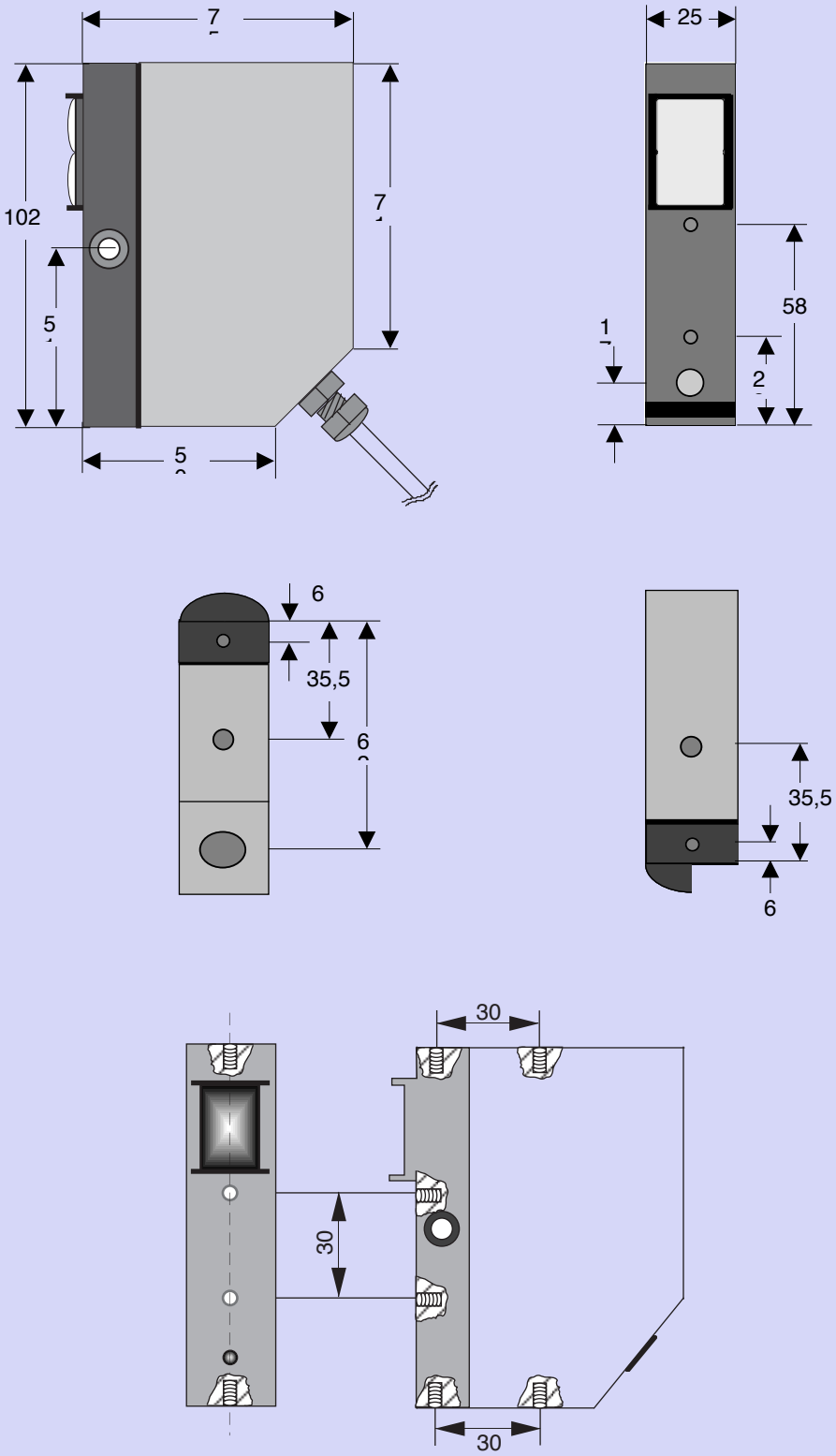
Technical data

operation voltage:	24 V / 110mA	ambient operation temperature:	-10°C up to +5
detection range:	15 m (reflector 100 x 100 mm)	weight:	250g
	2 m (white paper)	protection class:	IP 65
output:	1 potential free output (1x UM)		
connection type:	2m fixed cable		

Type plates



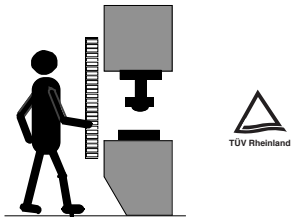
Dimensions	MFL



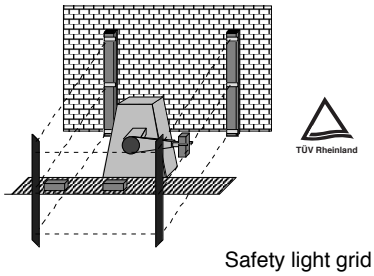
mounting: M4 straddling dowel on three housing walls, one through-bore for screws M6

Delivery program

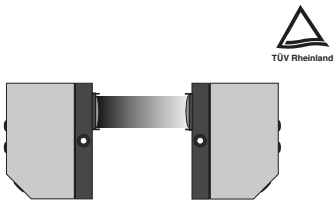
Fiessler Elektronik
Kastellstr. 9 D-73734 Esslingen
Telefon: 0711 / 91 96 97-0
Telefax: 0711 / 91 96 97-50
WWW.fiessler.de
E-Mail:info@fiessler.de



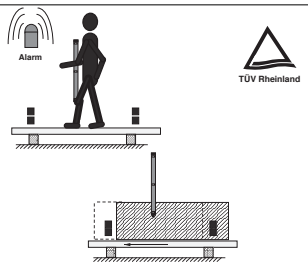
Safety light curtain



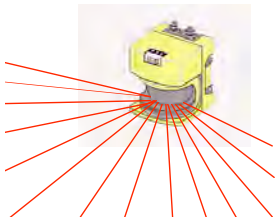
Safety light grid



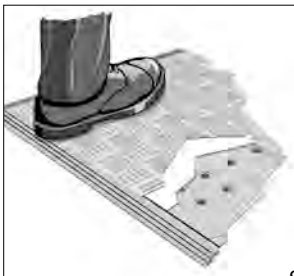
Single safety light beam



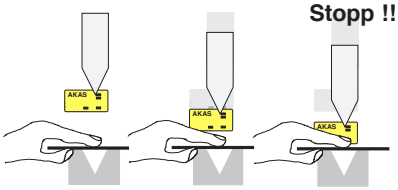
Safety light grid with muting function



Proximity scanner



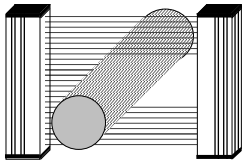
Safety mats



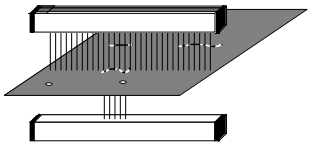
Press brake safety system

Safety foot pedal

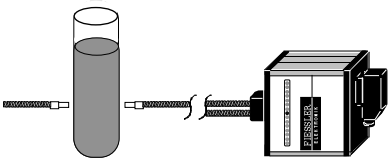
Safety PLC
Safety controllers



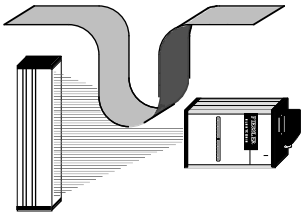
Measuring and controlling light curtains



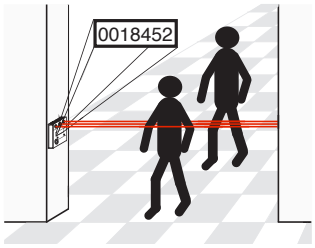
Hole detectors



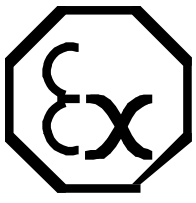
Turbidity sensors

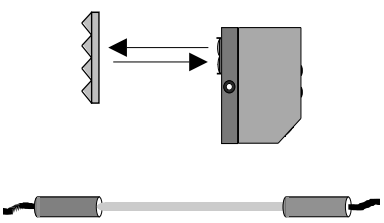


Analogue loop sensors



Counting light barriers

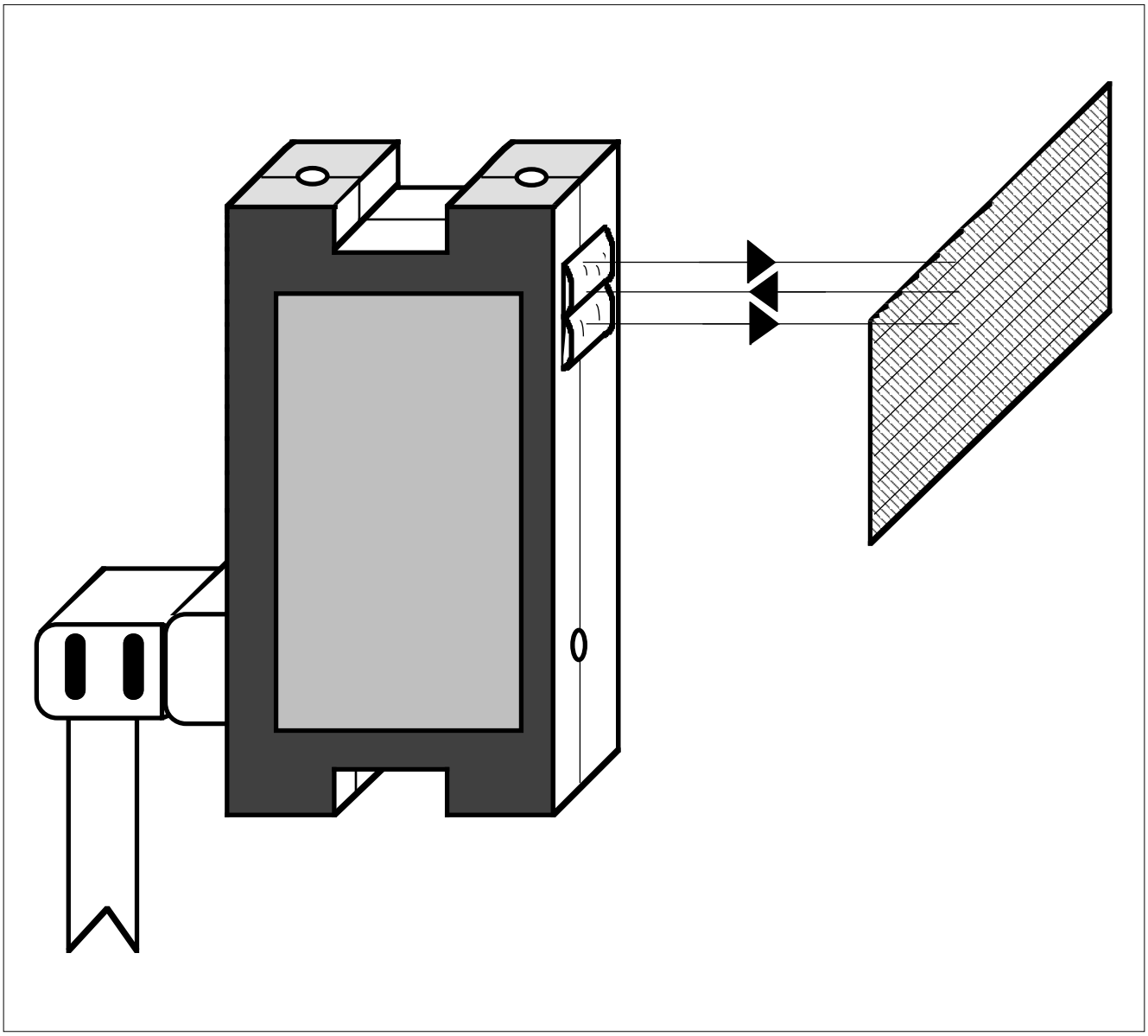




Light barriers for general purposes

Your application

Reflex- and Muting light barrier GR



Narrow design - Large detection range up

Flexible application - Variable installation

Integrated switching unit

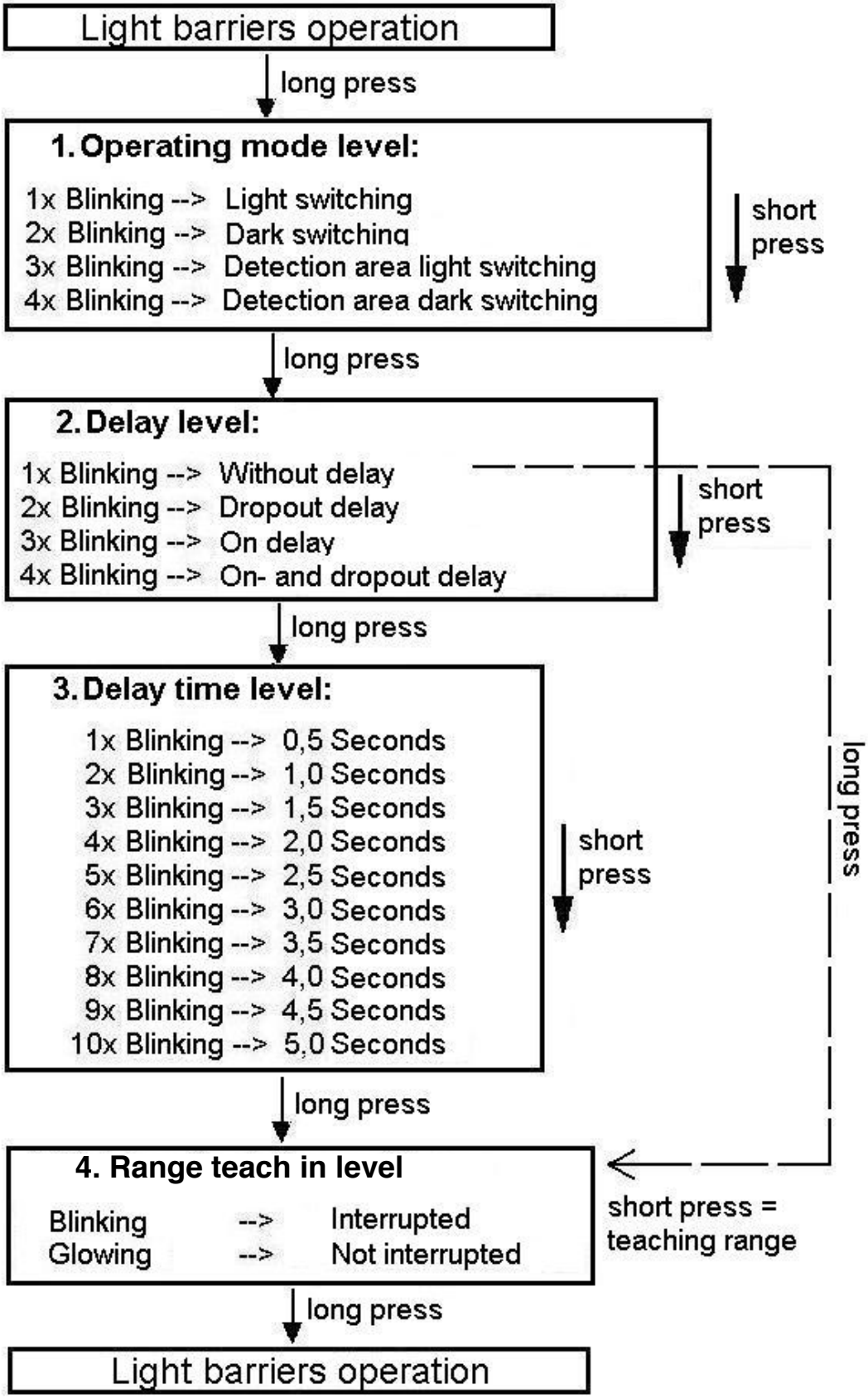
Light- or Dark switching

With cable or M12 plug connection

DIN EN ISO 9001
Reg.Nr. 96007

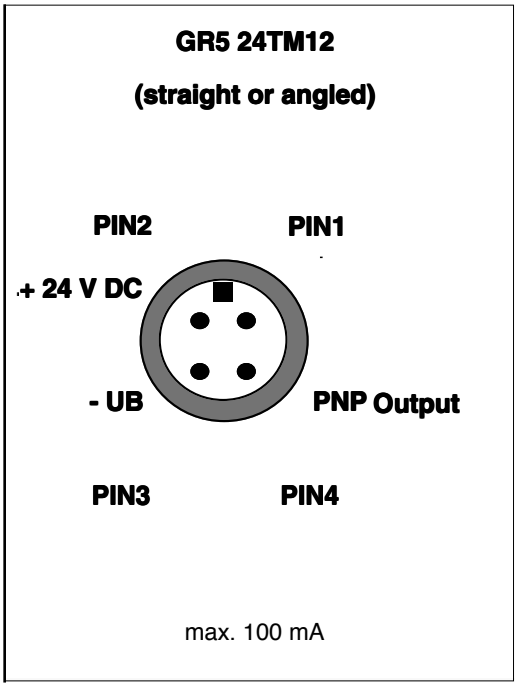
Type:	GR 5 24 T	GR5/ 24TM12DS	GR5/ 24TM12HS	GR 50 24	GR 100 24	GR 150 24
Max. detection range up with reflektor 100 x 100	5 m	5 m	5 m			
max. detection range up with scotchlite 10 x 24				20 - 80 mm	75 - 125 mm	80- 200 mm
Connection Voltage	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
No-load current	40 mA	40 mA	40 mA	40 mA	40 mA	40 mA
Type of light	infrared	infrared	infrared	infrared	infrared	infrared
Pulse frequency	15 kHz	15 kHz	15 kHz	15 kHz	15 kHz	15 kHz
Output	Transistor	Transistor	Transistor	Transistor	Transistor	Transistor
Max. voltage	30 V DC	30 V DC	30 V DC	30 V DC	30 V DC	30 V DC
Short circuit proof	yes	yes	yes	yes	yes	yes
NPN / PNP	yes	no / yes	yes / no	yes	yes	yes
Max. switching frequency	500 Hz	500Hz	500 Hz	1 kHz	1 kHz	1 kHz
Operating display	yes	yes	yes	yes	yes	yes
Cable connection	cable fixed cable length 2m	M12 plug cable length 2m	M12 plug cable length 2m	cable pluggable cable length 2m	cable pluggable cable length 2m	cable pluggable cable length 2m
Housing	PA 6	PA 6	PA 6	PA 6	PA 6	PA6
Operation ambient temperature	0°C - 50°C	0°C - 50°C	0°C - 50°C	0°C - 50°C	0°C - 50°C	0°C - 50°C
Protection category	IP 60	IP 60	IP 60	IP 60	IP 60	IP 60
Switching unit	integrated	integrated	integrated	integrated	integrated	integrated
Weight	50 g	50 g	50 g	50 g	50 g	50 g
Application	Mutingsensor PLSG-K FPSC usw...	Muting Sensor PLSG	Muting Sensor PLSG	for example : codification system by reflecting	for example : codification system by reflecting	for example : codification system by reflecting

Programming mode of the GR



Type: GR5 24TM12

Connection: (straight or angled)



Electrical power: max. 100 mA

cable colour:

Already assembled M12 cable	Cabel to self assemble
PIN1 = white	PIN1 = white
PIN2 = brown	PIN2 = brown
PIN3 = blue	PIN3 = green
PIN4 = black	PIN4 = yellow

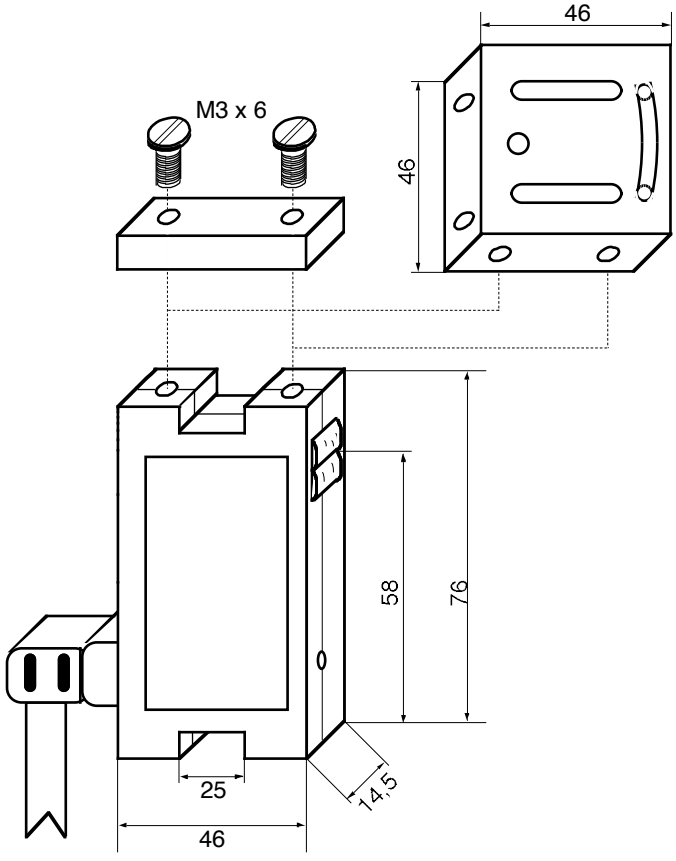
GR5 with M12 connector match for muting switching unit PLSG

Type:	GR 50 24	GR 100 24	GR 150 24
Connection:			
brown:	+24 V DC	+24 V DC	+24 V DC
green:	- Ub	- Ub	- Ub
white:	PNP / NPN Output	PNP / NPN Output	PNP / NPN Output
gray:	NC	NC	NC
yellow:	PNP / NPN Output	PNP / NPN Output	PNP / NPN Output
Electrical power:	max.: 100 mA	max.: 100 mA	max.: 100 mA

Mounting:

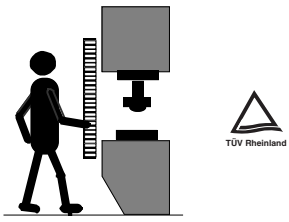
Standart equipment, with holder or fastening to square profile25x5mm, optional available with universal fastening angle.

Demensions:

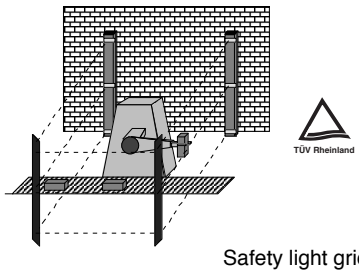


Delivery program

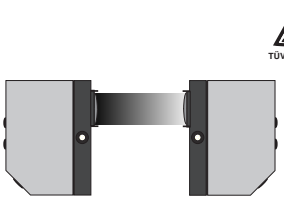
Fiessler Elektronik
Kastellstr. 9 D-73734 Esslingen
Telefon: 0711 / 91 96 97-0
Telefax: 0711 / 91 96 97-50
WWW.fiessler.de
E-Mail:info@fiessler.de



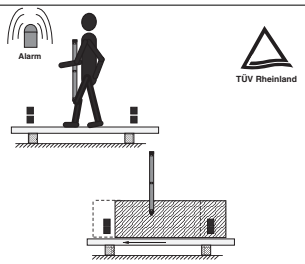
Safety light curtain



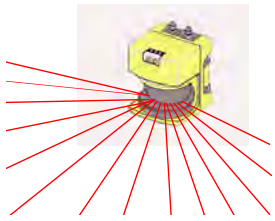
Safety light grid



Single safety light beam

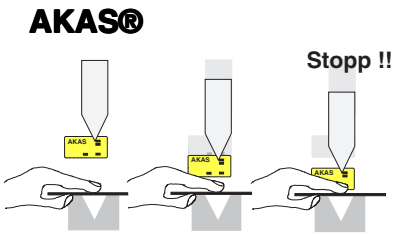


Safety light grid with muting function



Proximity scanner

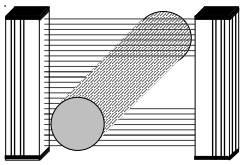
Safety mats



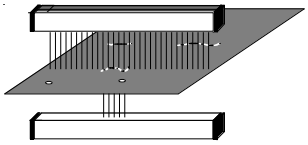
Press brake safety system

Safety foot pedal

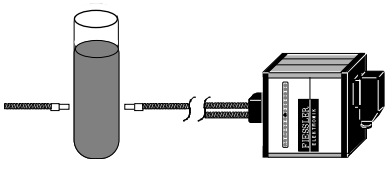
Safety PLC
Safety controllers



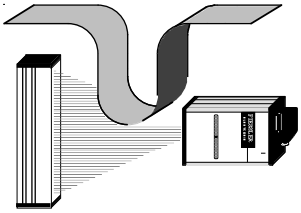
Measuring and controlling light curtains



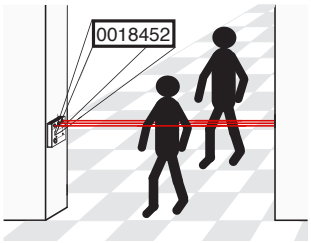
Hole detectors



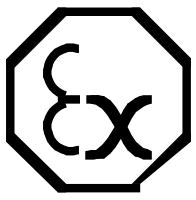
Turbidity sensors

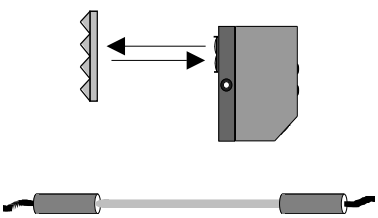


Analogue loop sensors



Counting light barriers

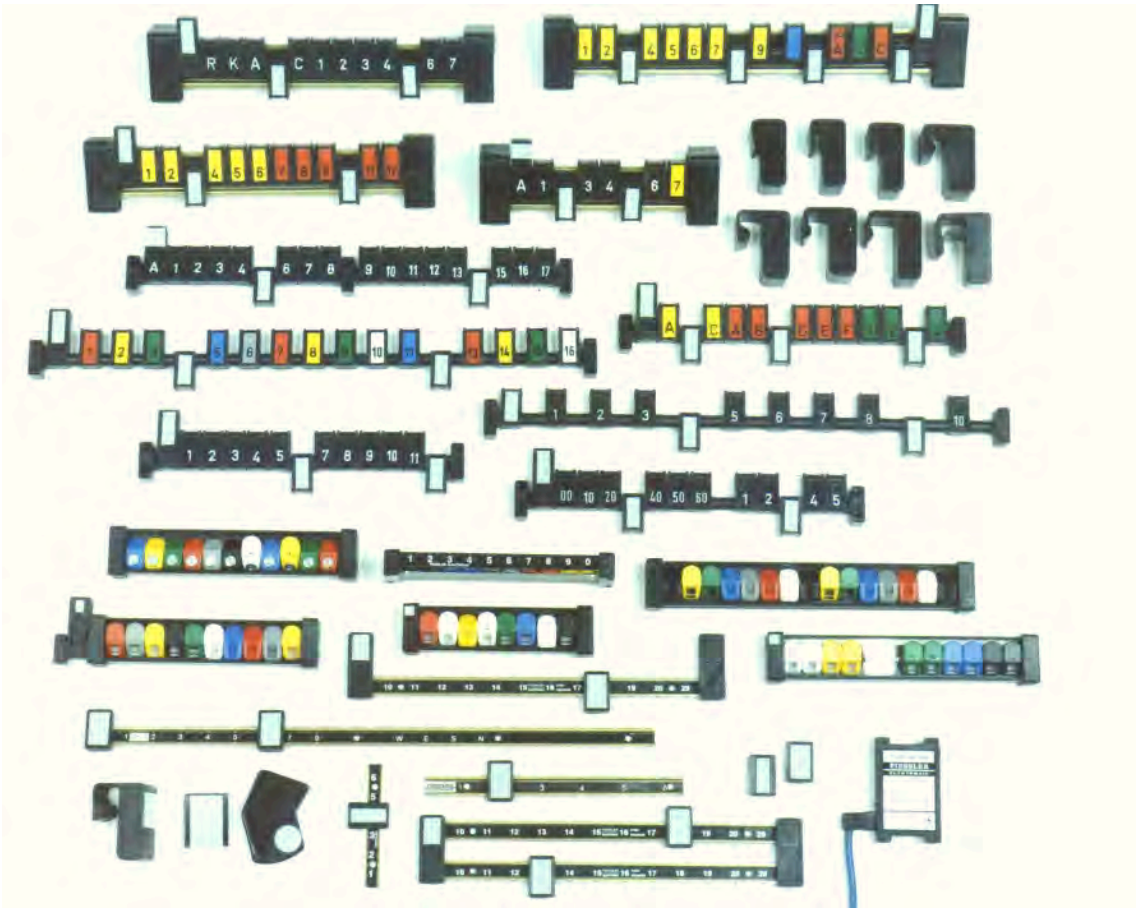




Light barriers for general purposes

Your application

Coding strips



Variable modular system

Available as folding, tilting, or sliding strips

Coding of flow programmes

Various mounting options

Visually readable coding

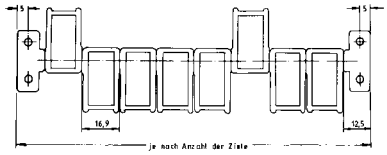
DIN EN ISO 9001
Reg.Nr. 96007

Application:

Coding strips are used for the steering control by transport containers in tape conveyor plants. Each coding strip consists of a fixed label and an arbitrary number of reflecting variable marks. The targets can be defined by folding, tilting, or sliding of the marks. Two light barriers are located at the stations of the conveyor belt the container is due to stop. These light barriers are mounted in the distance of the target and the fixed mark. As soon as the target and the fixed mark of the coding strip match with the light barriers of the station, the containers will be read out and moved out.

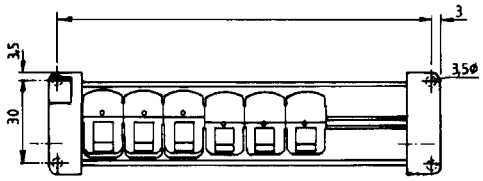
Folding coding strips:

The folding coding strips feature reflecting flaps which are arranged side by side or one above the other. The flaps carry the target number on one side and on the other side the reflectors. The reflectors can be switched on and off by flipping over. A resting holds the flaps in the desired position. This strip is characterized is easy to read and enables a simple setting of the desired targets. A large variety of mounting elements facilitates the mounting at most different containers.



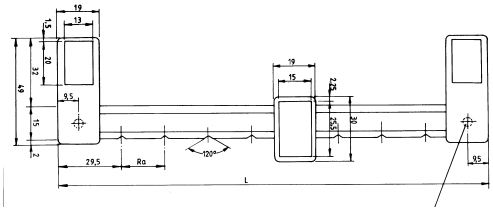
Tilting coding strips:

In order to enable to trigger as many as possible targets with only one strip and in order to enable an automatic actuating of the coding cams, this tilting strip was developed. Switching on and off is done via tilting of the cams by 45 degrees. By the small tilting angle it is possible to execute a setting of the targets using a manually controlles coding machine, a code pen or directly by a computer. By this, additional rationalization effects result.



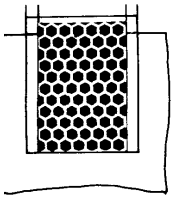
Sliding strips :

In conveyor plants, with only a few stations are used, a sliding coding strip is frequently used. For each target , the container must be coded anew. Since these strips are provided with large reflectors, they are suitable also for less exact path guides and rough environments.



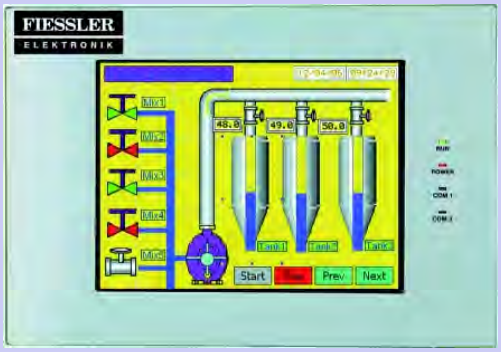
Single coding:

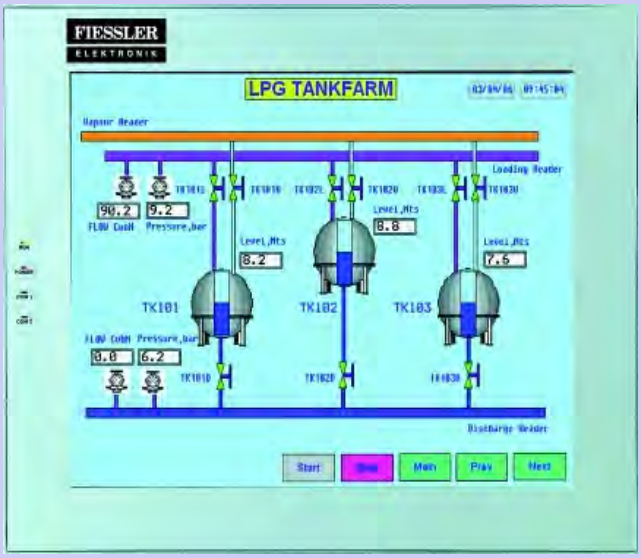
If only individual boxes have to be indicated, single reflectors can be added on the boxes. For this purpose, plastic holders for slip-on fastening are availble.



Reflex light barriers: **For the safe reading of the coding strips, there are special light barriers available, see P 7**

Human Machine Interfaces - HMI





Wide range of products in text and touch screen design

Direct connectable to FPSC and AKAS systems

Integrated PLC functionality in ladder programming mode

2 serial interfaces as standard

Up to 65535 windows per project programmable

Integrated RTC with predefined task to manage the different functions

Multiple project languages supported

DIN EN ISO 9001
Reg.Nr. 96007

Systemdescription, Application areas

The Fiessler Elektonik Human Machine Interfaces (FE-HMI) are used for diagnosis of intelligent controller units like the system families FPSC and AKAS. Due to their integrated intelligence it is possible to realize comfortable and ergonomic operating concepts. Moreover, with the integrated PLC functionality it is possible to make standard controlling tasks. All available display models are programmed by one programming software. For this, a lot of functions are available. The user can decide whether he would like to manage the windows due to predefined tasks or via the PLC function. Different memory areas support a clear and easy use.

With all display models the user can realize an intelligent alarm management. This is also supported by an integrated RTC.

Application areas:

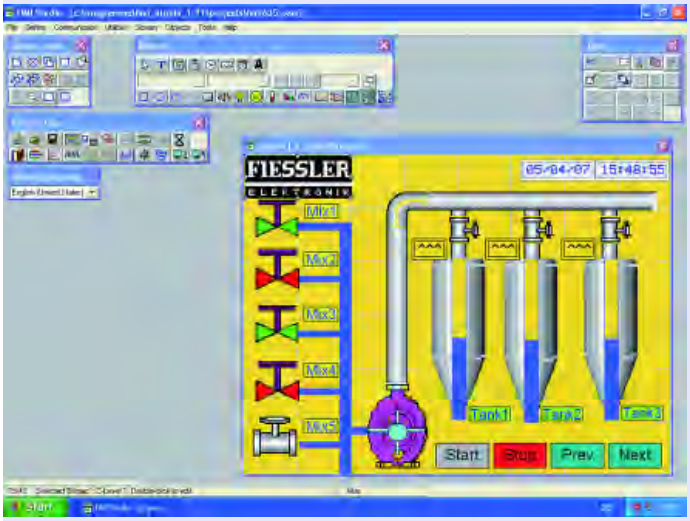
- Machine construction e. g. press brakes, eccentric and hydraulic presses, injection molding machines
- Wood machining e. g. veneer presses, saws
- Systems engineering e. g. conveyors, feeders,
- Special machine construction in general

Programming Software Fiessler HMI Studio

The programming software Fiessler HMI Studio (FE-HMI-Studio) is a very user-friendly software tool to configure and program the different display models.

By means of this software, the user can download the respective PLC-drivers for the interfaces, can manage the different memory areas as well as design the shape of the windows. A lot of predefined function will help the user to manage the windows, set the RTC, calculate with mathematical functions, or alarm managing.

Additionally there are functions to support multiple language window management for the end user. With the use of the integrated PLC function, complex application can also be solved by the displays. The PLC will be programmed in ladder mode.



A clearly arranged display of the different project tools supports the user to program the displays fast and easily.

Fiessler Elektronik HMI 201

The basic unit FE-HMI 201 is an alpha numerical text display with 2 lines of 16 characters each.

Main features:

- **o Keypad with numeric keys 0-9 and 8 function keys**
- **o very good price / benefit ratio**
- **o open for ergonomical operating concepts**
- **o 24 V DC power supply, no special power supply necessary**
- **o very compact design**
- **o 2 serial interface ports as standard**

Technical data FE-HMI 201

Display	
Resolution	16x2 (char. x lines)
Objects	Alpha numerical text
Display type	STN Monochrom
Color	Yellow-green
Contrast control	potentiometer
MTBF Backlit	100.000 hours
Character dots (W x H)	2,95 x 4,35
Dot size (WxH) [mm]	0,55 x 0,5
Windows fonts	not available
Operator input	
Data entry	Keypad
Function keys	8
Numeric entry buttons	0-9
Memory	
Total memory	512 kB
Application	120 kB
Data logging	not available
Data back up	not available
Ladder memory	max. 62 kB
CF card capacity	not available
Interface ports	
Serial ports, 9 Pin Dtype	2
Ethernet	not available
USB	not available

Function overview	
Ladder programming	Yes
Bar graph	Yes
"Real" Time Alarms	256
"Historical" Alarms	30
Unicode supported	not available
Graphical objects	not available
Printer port (serial)	Yes
Screen saver	not available
Electrical data	
Power supply	24V DC +/- 10%
Consumption	3 W
Inrush current	400 mA
Power ON LED	not available
Battery	3V Lithium, CR1225FH
Mechanical data	
Size (B x H x T) [mm]	108 x 70 x 72
Panel cut (B x H) [mm]	101 x 63
Installation	Panel mount
Net weight	150 g
Environmental data	
Operating temperature	0° bis 50° C
Storage temperature	-20° to 50° C
Humidity	10% to 90%
Condensation	not permitted
Protection class front	IP 65

Fiessler Elektronik HMI 401, 4,1"

With the small touch screen display FE-HMI 401 the user gets a very flexible and easy-to-program display with a good price / benefit ration. All control elements can be programmed with the software tool FE-HMI Studio.

Main features:

- **o integrated keypad object for data entry**
- **o industrial touch screen**
- **o integrated Real Time Clock**
- **o 24 V power supply**

Technical data FE-HMI 401, 4,1"

Display	
Resolution	192 x 64 pixels
Objects	pixel graphics
Display type	STN Monochrom
Color	Yellow-green
Contrast control	potentiometer
MTBF Backlit	50.000 hours
Character dots (W x H)	5x7; 7x14; 10x14; 20x28
Dot size (WxH) [mm]	0,46 x 0,46
Windows fonts	Yes
Operator input	
Data entry	Touch Screen
Function keys	projectable
Numeric entry buttons	Keypad objects integr.
Memory	
Total memory	512 kB
Application	120 kB
Data logging	not available
Data back up	not available
Ladder memory	max. 62 kB
CF card capacity	not available
Interface ports	
Serial ports, 9 Pin Dtype	2
Ethernet	not available
USB	not available

Function overview	
Ladder programming	Yes
Bar graph	Yes
"Real" Time Alarms	256
"Historical" Alarms	30
Unicode supported	Yes
Graphical objects	Yes
Printer port (serial)	Yes
Screen saver	Yes
Electrical data	
Power supply	24V DC +/- 10%
Consumption	3,5 W
Inrush current	550 mA
Power ON LED	not available
Battery	3V Lithium, CR1225FH
Mechanical data	
Size (B x H x T) [mm]	140 x 77 x 35
Panel cut (B x H) [mm]	132 x 70
Installation	panel mount
Net weight	270 g
Environmental data	
Operating temperature	0° bis 50° C
Storage temperature	-20° to 50° C
Humidity	10% to 90%
Condensation	not permitted
Protection class front	IP 65

Fiessler Elektronik HMI 601, 5,7"

The touch screen display FE-HMI 601 is the ideal unit for the development of medium HMI concepts. With a size of 5,7" the display offers a lot of opportunities to create ergonomical and good-looking windows.

Main features:

- **o large memory**
- **o integrated keypad objects for data entry**
- **o industrial touch screen**
- **o real time and historical alarms management**
- **o 4 LEDs for online diagnosis**

Technical data FE-HMI 601, 5,7"

Display	
Resolution	320 x 240 pixel
Objects	pixel graphics
Display type	STN Monochrom
Color	16 grey scales
Contrast control	potentiometer
MTBF Backlit	50.000 hours
Character dots (W x H)	5x7; 7x14; 10x14; 20x28
Dot size (WxH) [mm]	0,34 x 0,34
Windows fonts	Yes
Operator input	
Data entry	Touch Screen
Function keys	projectable
Numeric entry buttons	Keypad objects integr.
Memory	
Total memory	4 MB
Application	max. 3 MB
Data logging	max. 2 MB
Data back up	512 kB SRAM
Ladder memory	max. 128 kB
CF card capacity	not available
Interface ports	
Serial ports, 9 Pin Dtype	2
Ethernet	on request
USB	not available

Function overview	
Ladder programming	Yes
Bar graph	Yes
"Real" Time Alarms	256
"Historical" Alarms	2000
Unicode supported	Yes
Graphical objects	Yes
Printer port (serial)	Yes
Screen saver	Yes
Electrical data	
Power supply	24V DC +/- 10%
Consumption	10 W
Inrush current	1 A
Power ON LED	Yes
Battery	3V Lithium, CR1225FH
Mechanical data	
Size (B x H x T) [mm]	197 x 139 x 58
Panel cut (B x H) [mm]	184 x 126
Installation	panel mount
Net weight	650 g
Environmental data	
Operating temperature	0° to 50° C
Storage temperature	-20° to 50° C
Humidity	10% to 90%
Condensation	not permitted
Protection class front	IP 65

Fiessler Elektronik HMI 605, 5,7"

The coloured touch screen display FE-HMI 601 is the ideal unit for the development of medium HMI concepts. With a size of 5,7" the display offers a lot of opportunities to create ergonomical and good-looking windows.

Main features:

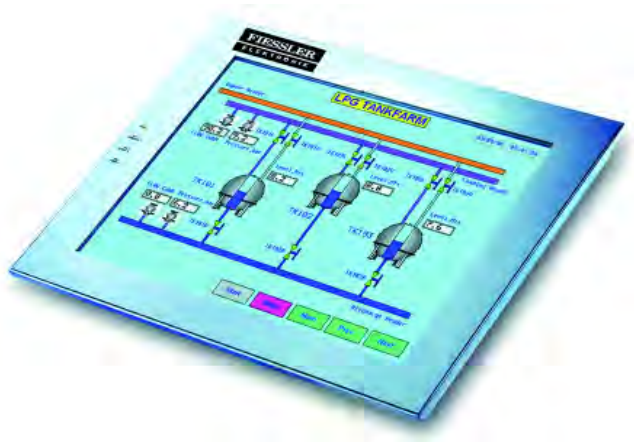
- o 256 colour display
- o large memory
- o integrated keypad objects for data entry
- o industrial touch screen
- o real time and historical alarms management

Technical Data FE-HMI 605, 5,7"

Display	
Resolution	320 x 240 pixel
Objects	pixel graphics
Display type	STN Colour
Color	256 Colour
Contrast control	potentiometer
MTBF Backlit	50.000 hours
Character dots (W x H)	5x7; 7x14; 10x14; 20x28
Dot size (WxH) [mm]	0,34 x 0,34
Windows fonts	Yes
Operator input	
Data entry	Touch Screen
Function keys	projectable
Numeric entry buttons	Keypad objects integr.
Memory	
Total memory	4 MB
Application	max. 3 MB
Data logging	max. 2 MB
Data back up	512 kB SRAM
Ladder memory	max. 128 kB
CF card capacity	not available
Interface ports	
Serial ports, 9 Pin Dtype	2
Ethernet	on request
USB	not available

Function overview	
Ladder programming	Yes
Bar graph	Yes
"Real" Time Alarms	256
"Historical" Alarms	2000
Unicode supported	Yes
Graphical objects	Yes
Printer port (serial)	Yes
Screen saver	Yes
Electrical data	
Power supply	24V DC +/- 10%
Consumption	10 W
Inrush current	1 A
Power ON LED	Yes
Battery	3V Lithium, CR1225FH
Mechanical data	
Size (B x H x T) [mm]	197 x 139 x 58
Panel cut (B x H) [mm]	184 x 126
Installation	panel mount
Net weight	650 g
Environmental data	
Operating temperature	0° to 50° C
Storage temperature	-20° to 50° C
Humidity	10% to 90%
Condensation	not permitted
Protection class front	IP 65

Fiessler Elektronik HMI 1205, 12,1"



The "high-end" display FE-HMI 1205 offers the user high flexibility, no limits in memory management and is easy to program. The good ratio between benefit and price provides an optimal support of the HMI concepts.

Main features:

- o 32 MB basic memory, expandable
- o 12,1" display size
- o a lot of predefined objects
- o real time and historical alarms management
- o industrial touch screen

Technical data FE-HMI-1205, 12,1"

Display	
Resolution	800 x 600 pixel
Objects	pixel graphics
Display type	TFT colour
Color	256 colour
Contrast control	potentiometer
MTBF Backlit	50.000 Stunden
Character dots (W x H)	5x7; 7x14; 10x14; 20x28
Dot size (WxH) [mm]	0,34 x 0,34
Windows fonts	Yes
Operator input	
Data entry	Touch Screen
Function keys	projectable
Numeric entry buttons	Keypad objects integr.
Memory	
Total memory	32 MB
Application	max. 25 MB
Data logging	max. 25 MB
Data back up	512 kB SRAM
Ladder memory	2 MB
CF card capacity	256 MB on request
Interface ports	
Serial ports, 9 Pin Dtype	2
Ethernet	on request
USB	not available

Function overview	
Ladder programming	Yes
Bar graph	Yes
"Real" Time Alarms	256
"Historical" Alarms	2000
Unicode supported	Yes
Graphical objects	Yes
Printer port (serial)	Yes
Screen saver	Yes
Electrical data	
Power supply	24V DC +/- 10%
Consumption	20 W
Inrush current	1 A
Power ON LED	Yes
Battery	3V Lithium, CR1225FH
Mechanical data	
Size (B x H x T) [mm]	312 x 246 x 47
Panel cut (B x H) [mm]	295 x 227
Installation	panel mount
Net weight	2,8 kg
Environmental data	
Operating temperature	0° to 50° C
Storage temperature	-20° to 50° C
Humidity	10% to 90%
Condensation	not permitted
Protection class front	IP 65

Order identifier for Fiessler HMI units and accessories

HMI units	
Alpha numerical text display, 2 lines of 16 characters each	FE-HMI-201-S
Touch Screen display, 4,1", monochrome	FE-HMI-401-S
Touch Screen display, 5,7", monochrome	FE-HMI-601-S
Touch Screen display, 5,7", 256 colours	FE-HMI-605-S
Touch Screen display, 12,1", 256 colours	FE-HMI-1205-S

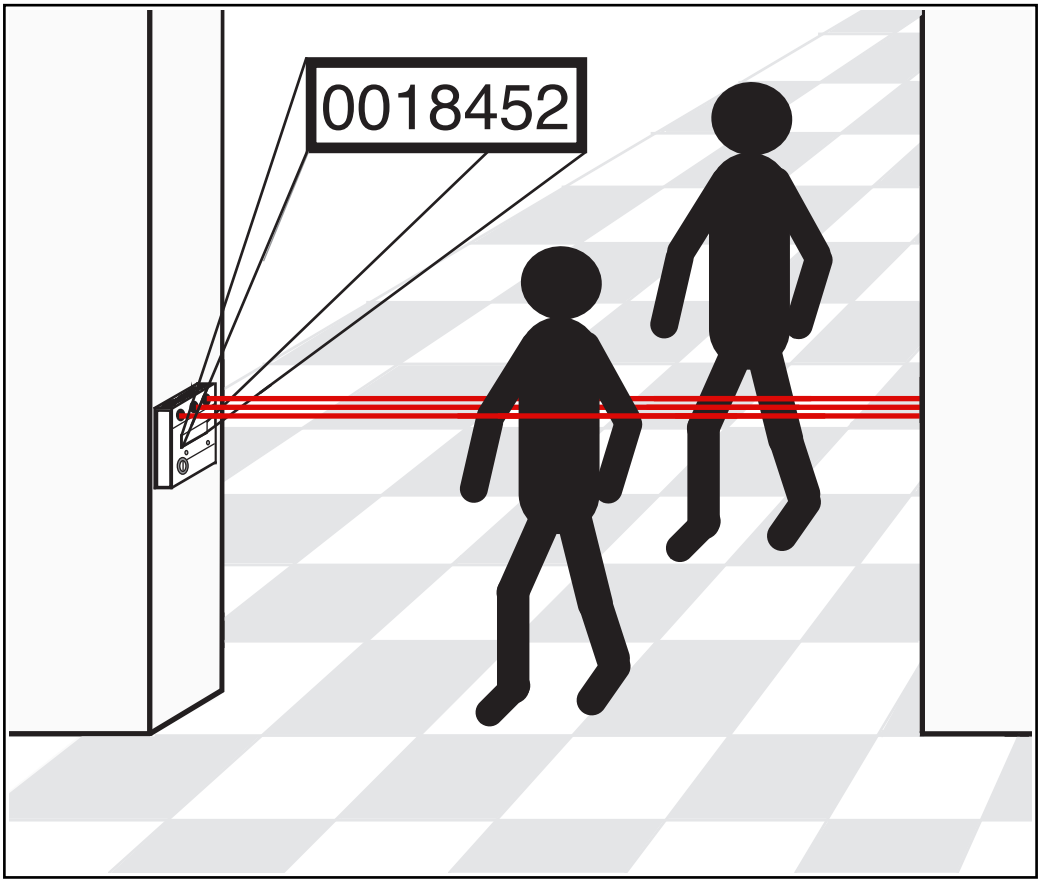
Software	
Programming software for all Fiessler Elektronik HMI units	FE-HMI-Studio

Accessories	
RS 232 programming cable. Connection of HMI display and PC	FE-HMI-Cable
Additional operating manual on CD, english	FE-HMI-Manual-GB

FIESSLER ELEKTRONIK

Data sheet

Counting light barriers
RAZL 6



customer counting device for:

- furniture stores
- department stores
- exhibitions
- museums
- retail shops etc...

available with software module to read out via USB port and Windows software

Provides reliable evaluation of your visitor numbers

One directional or bi-directional detection

Integrated digital sum counter

Easy adjustment, readable with USB connection (optional)

Reset by key switch or software

ZERT
DIN EN ISO 9001
Reg.Nr. 96007

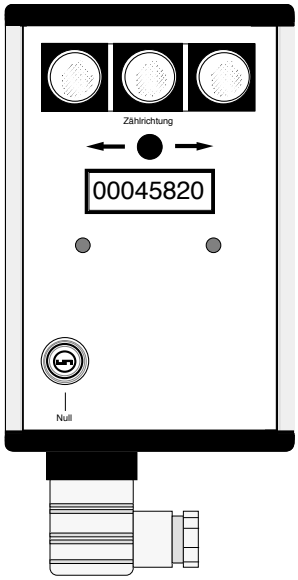
Fiessler Elektronik Kastellstr. 9
D - 73734 Esslingen
Telefon: +49 (0) 711 / 91 96 97-0 Internet: http://www.fiessler.de
Telefax: +49 (0) 711 / 91 96 97-50 eMail: info@fiessler.de

Application :

The direction-controlled counting light barrier **RAZL/6** is used for counting persons visiting., p.e. :
- department stores - museums - exhibitions - travel agencies - all kinds of retail shops etc.

The counting barriers and their reflectors are installed at entrances or in passageways. Frequencies of customer visits will be made clearer, therefore leading to:
- better staff development
- simple evaluation of response to advertisement activities
- greater efficiency in product placement or placement of exhibits

further applications:
- traffic census
- counting and time-related evaluation of objects inside flow of material and production



Function :

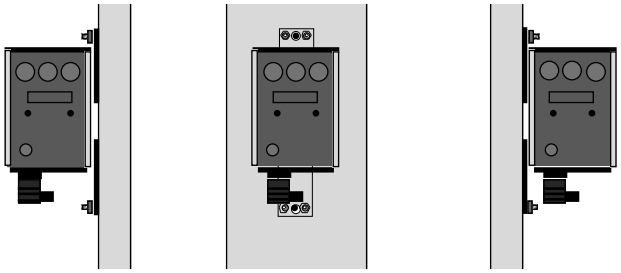
The housing holds 2 light barriers and one 8-digit LCD display with reset by key switch.

Counting direction is selectable via a slider switch. This switch can be shitted after having removed a rubber stopper from the front panel.

The LEDs on the front panel show the current state of the light barriers. If the light beams are completely interrupted, both LEDs will light up. If the key switch is turned, or if power supply is cut off, the counter contents of the memory is deleted. If the light barrier is turned on again, the counter will start again at "Zero". Regular maximum detection range of the counting barrier and its reflector is 6 meters. Minimum distance between transmitter and reflector is 0,8 meters.

Mounting :

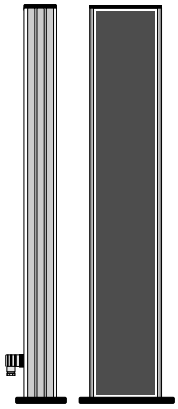
Sliding tenon blocks and mounting brackets provide easy and flexible mounting of the units on all three sides of the housing.



Mounting columns:

As option, for all RAZL types there are mounting columns available.

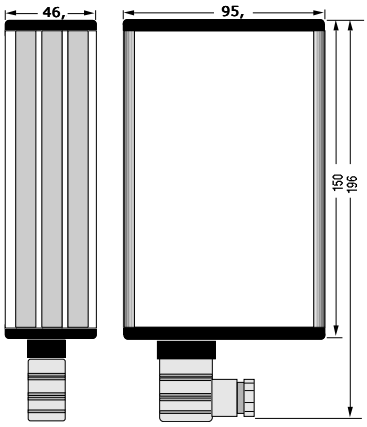
Height: 1,3 meters.



Standard and special types:

- RAZL/6, ZL/6 (no definition of counting direction)
- Relay or Transistor(PNP) outputs
- supply voltage 230V AC (only with Relay) or 24V DC
- special types with 2 Relay or 2 Transistor outputs.

Dimensions :



Mounting directions:

The fastening brackets are designed for fixing and adjustment of the counting unit and are included in the standard delivery. Together with the tenon blocks, the brackets provide a universal fastening. After having mounted the counting unit at the desired place, the reflector must be placed in the same height, right opposite to the counting unit. For a reliable function, the beams from the optics of the counting unit must hit the reflector right in its center. For realizing this, a fine adjustment is necessary. With the help of the enclosed lock nuts, the counting unit can be swiveled.

RAZL/6:

In order to assure a reliable counting, the direction- controlled light barrier must be swiveled in a way that both light sensors dispose of a sufficient reserve. This is verified by the blanking of the reflector from all directions, until the light sensors are interrupted. The LEDs display the current state of the light barriers. When blanking the reflector, the sequence of the flashing / darkening LEDs must be closely observed. If blanking is carried out from the left to the right side of the reflector, the left LED must light up prior to the LED at the right. If, however, the right LED lights up prior top the left one, the counter must be swiveled slightly to the left. The same procedure applies viceversa to the blanking from the right hand side.

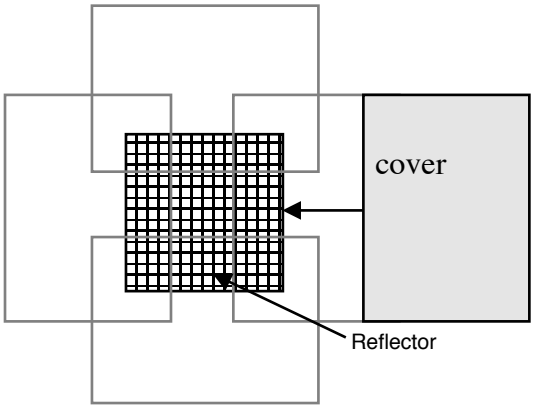
ZL/6:

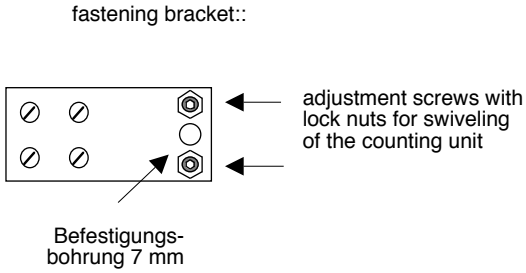
Same as the direction controlled counting unit, it must be adjusted according to the position of the reflector. By blanking of the reflector from all sides it can be verified if the counting unit disposes of sufficient reserve.

General:

If there is enough room at the reflector`s side, the exact mounting of the reflector can also be realized by changing of the reflector position. If the adjustment of the reflector is done correctly, and if the reflector is located at the right position, the fine adjustment of the counting unit is no more necessary.

The distance between the counting unit and the reflector (standard types) must never fall below the minimum distance between counting unit and reflector of 0,8 meters. The maximum detection range of the standard counting barrier is 6 meters. When using a counter memory: if the power supply is cut off for more than 26 hours, the count memory may display an erratic value. This can be erased by turning the key switch.





Connection :

RAZL/6, ZL/6
3 core

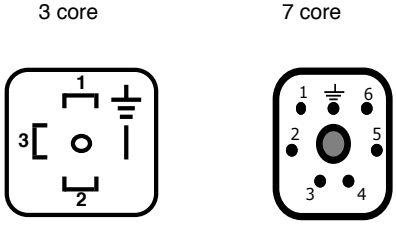
1: L1 230V AC
2: N
3: --
⏚: PE

RAZL/6 R,RZ
7 core

1: L1 230V AC
2: N
3:
4:
5:
6: --
⏚: PE

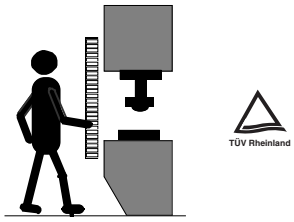
RAZL/6 TP
7 core

1: L1 230V AC
2: N
3: --
4: output pnp
5: 0V (-)
6: --
⏚: PE

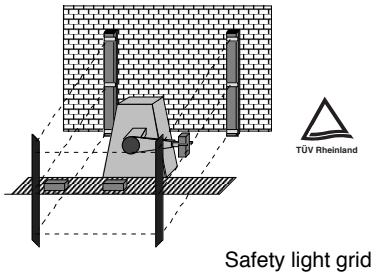


Delivery program

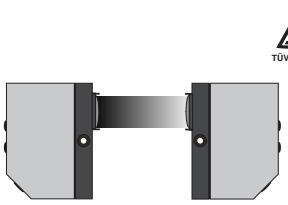
Fiessler Elektronik
Kastellstr. 9 D-73734 Esslingen
Telefon: 0711 / 91 96 97-0
Telefax: 0711 / 91 96 97-50
WWW.fiessler.de
E-Mail:info@fiessler.de



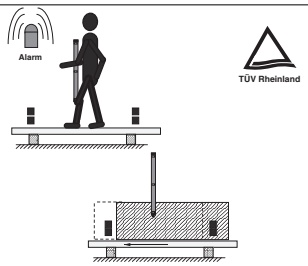
Safety light curtain



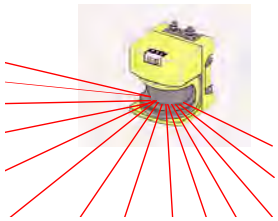
Safety light grid



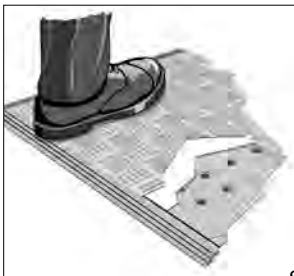
Single safety light beam



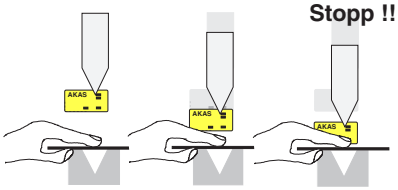
Safety light grid with muting function



Proximity scanner



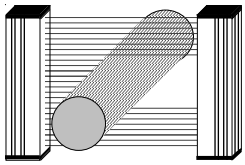
Safety mats



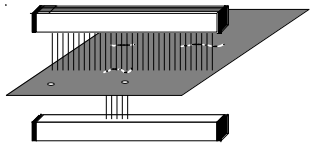
Press brake safety system

Safety foot pedal

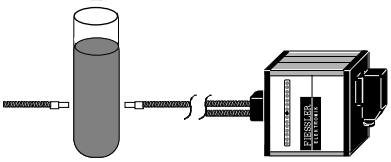
Safety PLC
Safety controllers



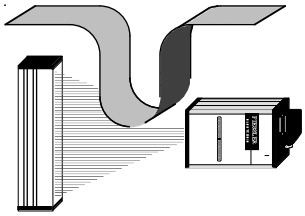
Measuring and controlling light curtains



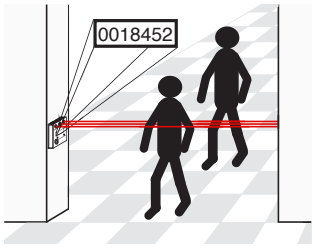
Hole detectors



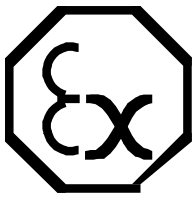
Turbidity sensors

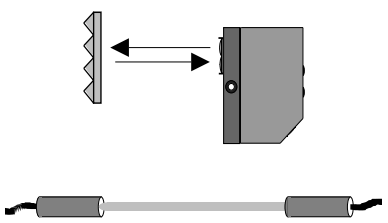


Analogue loop sensors



Counting light barriers





Light barriers for general purposes

Your application