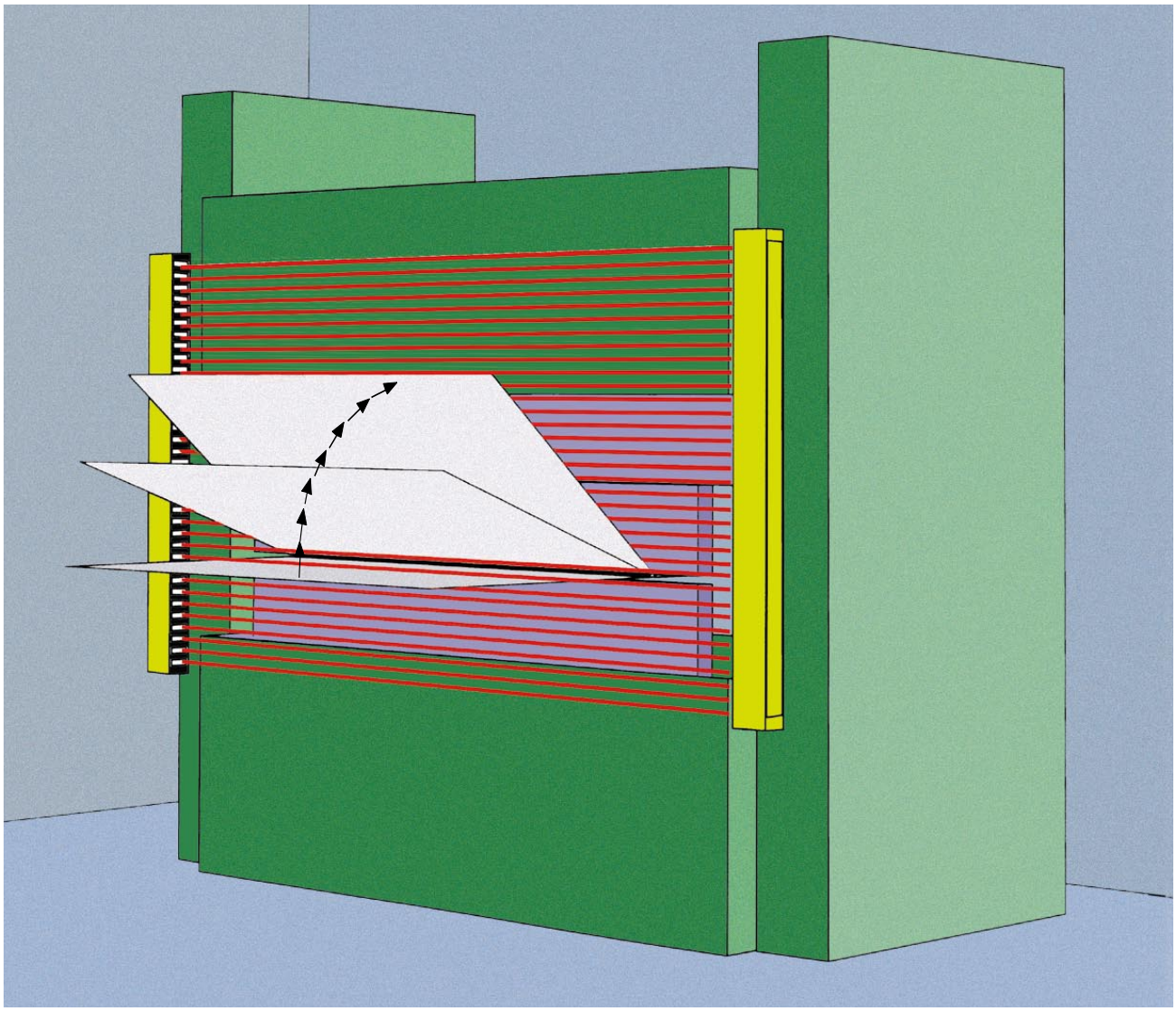
FIESSLER ELEKTRONIK

Data sheet

Safety Light Curtains with Blanking features

BLVT



blanking of obstacles with reliable safety

11 blanking features easy to program

integrated switching unit: contactor control and restart interlock

extremely short reaction times

protective field up to 1,9 m high, range 20 m

TÜV

CE

ZERT

DIN EN ISO 9001
Reg.Nr. 96007

Features

The safety light curtains BLVT are electrosensitive protective devices (EPSE) and are caracterized by:

- **Blanking** features for blanking any obstacles in the detection field
- compliance with **Safety category 4,** according to EN 954-1 and IEC 61496 parts 1 & 2 i.e. EN 61496
- integrated switching unit, **contactor control** and restart interlock activated by Dip-switches
- can be **connected directly** to contactors/valves, switching capacity 0,5A/24V
- minimum safety distance due to short response times, between 5 ms and 25 ms, depending on constructional length
- detection of smallest obstacles (14 mm / 30 mm) inside a detection range of 7 meters / 24 meters
- between 7 and 247 beams with protective heights from 100 up until 2500 mm
- micro-processor controlled safety functions
- self-monitoring semiconductor outputs with line interruption monito ring, short-circuit- and side current passages check
- built-in self-diagnosis with error display
- protective system IP 65 (waterproof sealed)

Application

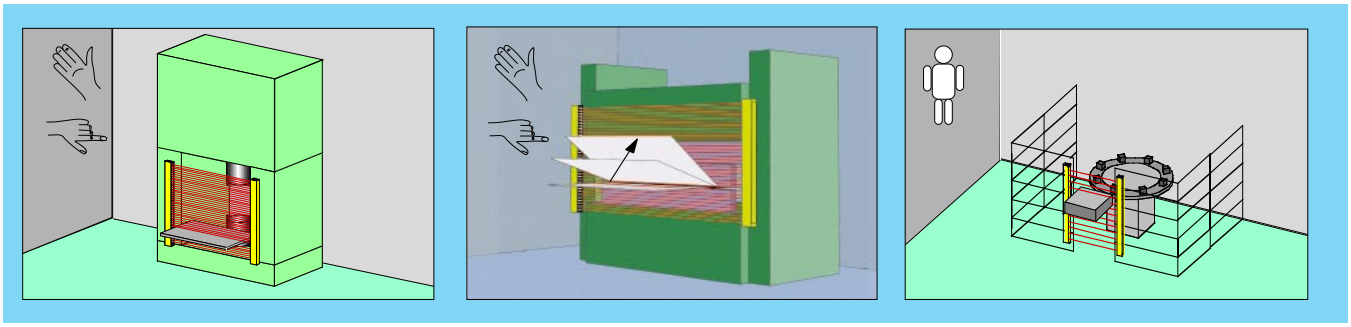
The safety light curtains BLVT designed especially for their use as protection devices at hazardous sites and areas, as well as pedestrian access. By the use of the blanking features, moving or stationary objects can be blanked.

BLVT provide the prevention of bodily injuries of fingers, hands, and limbs, e.g. when working at:

- raw material converting presses operated in the metal, wood, plastic, rubber, leather, glass industry
- filter presses
- folding and bending machines
- die-casting machines
- processing lines and welding presses
- insertion machines
- robots
- palletizers

By diverting mirrors the detecting beams can be diverted around a hazardous area so that a polygonal protected area is created.

Muting and fixed cycle operation with optional control units are possible.



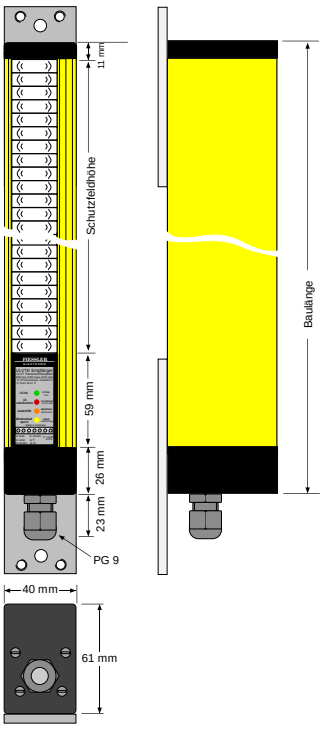
protection of daerous sites

protection at press brakes

pedestrian access protection

Design The safety light curtains BLVT consist of two components: transmitter and receiver. Their detection range is defined by the distance between both transmitter and receiver; their protective height depends on their individual constructional height (overall height).
Protective heights from 100 mm through 2500mm are available because of their modular design. On demand, construction of special dimensions units for intermediate-sized applications is possible.

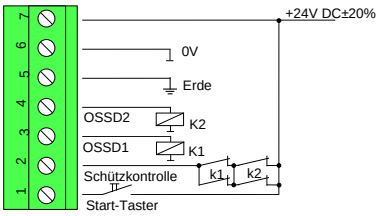
Function The transmitter generates infra-red light beams flashing at high speed in synchronous action. The parallel light beams with a spacing of 7,5mm or 14,3mm are monitored by micro-controllers. The receiver evaluated the arriving beams in synchronous action to the transmitter.
Due to the closeness of the beams, a resolution of 14 mm / 30 mm is achieved. If an obstacle is placed into the protective field, i.e. at least iner lieght beam is interrupted, the hazardous movement of the machine is stopped, i.e. a new start is not possible.



resolution 14 mm				resolution 30 mm	
protective height (mm) /number of beams	construc-tional height (mm)	order code BLVT ...	respon-se time (ms)	order code BLVT ...	respon-se time in ms
100 / 13	196	100 /13	7	100 /7	6
200 / 26	296	200 / 26	9	200 / 14	7
300 / 39	396	300 / 39	10	300 / 21	8
400 / 52	496	400 / 52	12	400 / 28	9
500 / 65	596	500 / 65	14	500 / 35	10
600 / 78	696	600 / 78	15	600 / 42	11
700 / 91	796	700 / 91	17	700 / 49	11
800 / 104	896	800 / 104	19	800 / 56	13
900 / 117	996	900 / 117	20	900 / 63	14
1000 / 130	1096	1000 / 130	22	1000 / 70	14
1100 / 143	1196	1100 / 143	24	1100 / 77	15
1200 / 156	1296	1200 / 156	25	1200 / 84	16
1300 / 169	1396	1300 / 169	27	1300 / 91	17
1400 / 182	1496	1400 / 182	28	1400 / 98	18
1500 / 195	1596	1500 / 195	30	1500 / 105	19
1600 / 208	1696	1600 / 208	32	1600 / 112	20
1700 / 221	1796	1700 / 221	33	1700 / 119	21
1800 / 234	1896	1800 / 234	35	1800 / 126	21

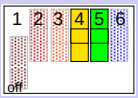
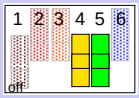
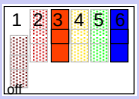
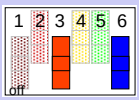
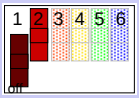
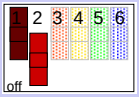
direct connection of contactors / valves

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



contactor / valve control and restart interlock

Various operational modes can be selected via disp-switches located in the connecting lid.

without contactor control 	**with contactor control** 	The operational mode **with contactor control** serves for monitoring of the triggered secondary contactors. After each interruption of the beams and before each release of the outputs, it is verified whether the secondary contactors have fallen. Only then another release is possible. If there is no reaction by contactors within 300 ms, the light curtain switches off the outputs and turns into interruption/locked mode.
without restart interlock 	**with restart interlock** 	If the operational mode with restart interlock is selected, a push-button must be installed at the start button input in order to release the start of the working movement. With free protective field, the yellow receiver LED lights up, requesting operation start. Only after pushing the start button both outputs of the ULVT are activated.
equivalent outputs 	**antivalent outputs** 	During the operational mode **equivalent outputs** both PNP-outputs are safety outputs and provide short-circuit- and side-current passages monitoring. With free optical path both outputs are high (+24V). During the operational mode **antivalent outputs**, output No .1 is high (+24V) and output No. 2 low (0V), with free optical path. **During this operational mode, output 2 does not provide fail-safe results. This operational mode is only permitted if the safety control units LSUW NSR 3-1K, LSUW N1-Muting K or another safe secondary control to monitor output No. 2. are applied!**

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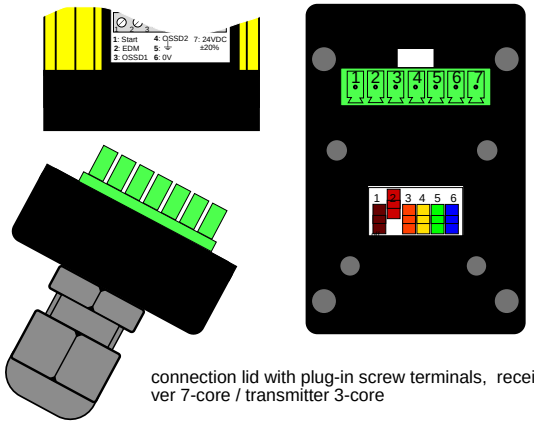
Integrated connectors in the connecting lid

The standard equipment of the product series ULVT includes an extra flat plug-in connection located in the connection lid. This lid may be removed without disconnecting the cable. The housing itself remains sealed.

Several custom-made connection plugs are available as options.

The transmitter is connected via a 3-core cable, the receiver is connected via a 7-core-cable (according to the respective operational function).



connection lid with plug-in screw terminals, receiver 7-core / transmitter 3-core

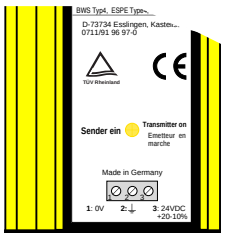
LED-displays

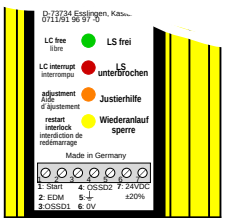
By means of several LEDs, the operational status or an error status is displayed. Interruptions of the protective field, requests for starting the machine or errors are easily detectable.

self-diagnostic system

If the system detects an internal or external error, the machine will be stopped immediately. This error alarm is visually indicated by a flashing LED in the transmitter or receiver display. During error status, the detected error will be displayed by the flashing LEDs by the use of a special error displaying code.

There is a special error-detecting device available for the use by accordingly trained machine operators. This device offers the exact localization of the detected error. During error status, the detected error will be displayed by the flashing LEDs by the use of a special error displaying code.





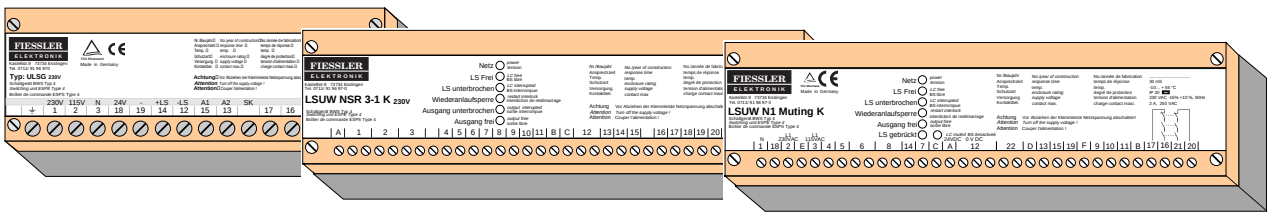
transmitter	
yellow on	transmitter active
yellow out	transmitter out
yellow flashin	error

receiver	
green on	LC free
red on	LC interrupted
orange on	dirty (no Reserve)
yellow on	start request
orange flashingt	error
yellow flashing	error

Characteristic data	ULVTS… / BLVTE…	
safety class	Type 4 according to EN 954-1 and IEC 61496 parts 1 + 2 i.e. EN 61496 parts 1+ 2	
protective height	100 mm … 2500 mm (depending on number of beams)	
protective length (detection range)	0,3… 18 m	
constructional height	196 mm … 2596 mm (depending on number of beams)	
resolution	smallest obstacle recognition of 14 mm	
number of beams	7… 247 beams	
operational modes	**selectable via Dip-Switches:** - with / without restart interlock - mit / ohne Schützkontrolle - euqivalent / antivalent outputs	**with optional safety control units:** - Muting (bridging unit) - stroke operation 1-stroke/2-strokes (p.e. when inserting) - protected operation with restart **only during the hazardous movement** - programmer unit for activating blanking features
Mechanical Data		
Housing design	Aluminum profile, plastic-coated RAL 1020, yellow, end pieces made from non-corrosive, spherically reinforced plastic (polyamide). Plexiglass light outlet and inlet, optional with solvent-resistant silicate glass.	
attachment	shifting fastening brackets on rear side of housing	
weight	transmitter: 0,45 kg to 5 kg depending on construction length receiver: 0,5 kg to 5,5 kg depending on construction lenght	
Operating Data		
protection category	IP 65	
protection class	III	
operating ambient tempera	-10 to 55 °C	
storage temperature	-25 to 70 °C	
Electric data	**transmitter ULVTS**	**receiver BLVTE**
power supply	24 V DC SELV, + 20 % - 10 %	24 V DC SELV, ±20%
current draw	max. 250 mA	max. 250 mA (no load)
outputs	-	OSSD 1 and 2: safety PNP-outputs, max. 0,5 A, short-circuit- and side-current passages monitoring. (in operation mode *antivalent outputs* output No. 2 is not fail-safe, max. 20 mA)
inputs	-	Inputs contactor control and start button: 0 V up to 24 V DC ±20%, 10mA
electric connection	integrated plug-in connecton with PG9 as traction relief, alternative: custom-made connection plugs	integrated plug-in connecton with PG9 as traction relief alternative: custom-made connection plugs
connecting cable	3-pol. max. 1,5 mm^2	5 to 7-pin (according to operating mode) max. 1,5 mm^2

additional functions

For additional functions, like potential-free output contacts, stroke operation or Muting, the optional safety switching units ULSG, LSUW NSR 3-1-K and LSUW N1-Muting K are available, as well as a special programmer device for the Blanking program.

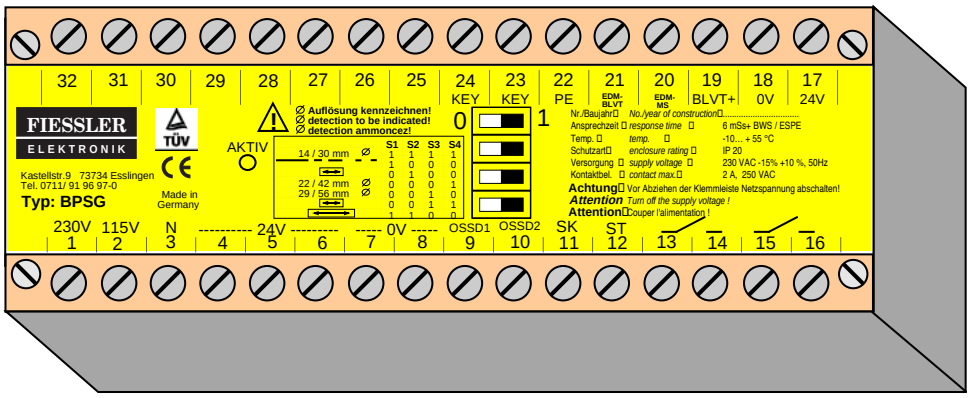


Programmer for activation of blanking functions.

Simple programming by 4 dip switches, authorization by key-switch.

BPSG: For blanking light barriers with power supply and restrictedly guided relais with potential-free outputs.

BLPG: Programmer for blanking light barriers. Unit may be removed after completed programming. The program will remain permanently in the light curtain and will remain unaffected even in case of a voltage drop.



Propgrammer unit BPSG for programming of the blanking functions.

different kinds of blanking

Blanking patterns	application	Caution!! Please observe!	S1	S2	S3	S4
Blanking out (like regular light curtains)			1	1	1	1
A) stationary blanking	blanking of certain machine parts that permanently penetrate into the protective field. Up to 5 blanking sectors of random extent are possible		1	0	0	0
B) stationary blanking with resolution reduced by blanking of **one** beam	same as A) but every 2nd beam can be additionally interrrupted (i.e. for blanking of hoses or cables).	Safety distance must be laid out according to the reduced resolution.	1	0	0	1
C) stationary blanking with resolution reduced by blanking of **2** beams	same as A) but any pair of 2 adjacent beams can be additionally interrupted at the same time. (i.e. for blanking of hoses or cables). This may be repeated perpetually.	Safety distance must be laid out according to the reduced resolution.	1	0	1	0
D) moveable blanking: only **one** section of the protective field can be blanked (floating blanking)	detection of disturbing machinery parts that move inside of the protective field.	blanking must cover entire length of protective field	0	1	0	0
E) moveable blanking: with resolution reduced by blanking of **one** beam	floating blanking same as D) but every 2nd beam can be additionally interrrupted at the same time (i.e. for blanking of hoses or cables)	Safety distance must be laid out according to the reduced resolution.	0	1	0	1
F) stationary blanking with resolution reduced by blanking of **2** beams	floating same as D) but one pair of 2 adjacent beams can be additionally interrupted at the same time (i.e. for blanking of hoses or cables)	Safety distance must be laid out according to the reduced resolution.	0	1	1	0
G) with resolution reduced by blanking of **one** beam may be repeated perpetually !	every 2nd beam can be additionally interrrupted (i.e. for blanking of hoses or cables)	Safety distance must be laid out according to the reduced resolution.	0	0	0	1
H) resolution reduced by blanking of **2** beams may be repeated perpetually !	each pair of 2 adjacent beams can be additionally interrupted at the same time (i.e. for blanking of hoses or cables).	Safety distance must be laid out according to the reduced resolution.	0	0	1	0
I) ignore 1 beam for only one time (full resolution for the remaining protective field)	Blanking of one single beam at any random position inside the protective field will be ignored once. (i.e. for blanking of hoses or cables).	Safety distance must be laid out according to the reduced resolution.	0	0	1	1
K) ignore two beams for only one time (full resolution for the remaining protective field)	Blanking of two adjacent beams at any random position inside the protective field will be ignored once. (i.e. for blanking of thicker metal sheets in bress brakes).	Safety distance must be laid out according to the reduced resolution.	1	1	0	0

The blanking pattern must always cover the complete length of the protective field.

Lieferprogramm:

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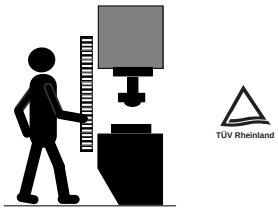
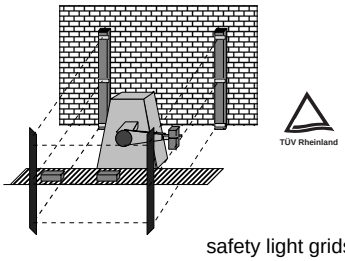
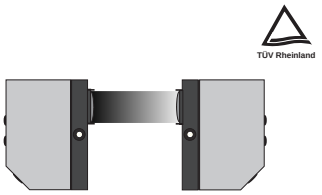


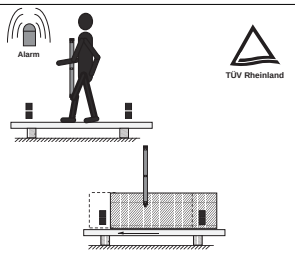
safety light barriers



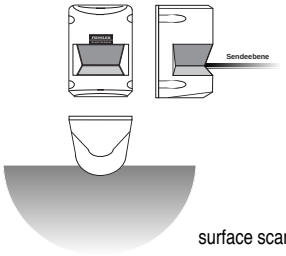
safety light grids



single-beam safety light barriers

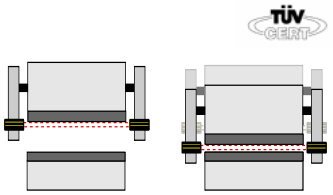


safety light grids with muting function

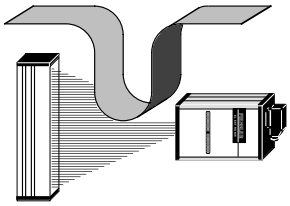


surface scanners

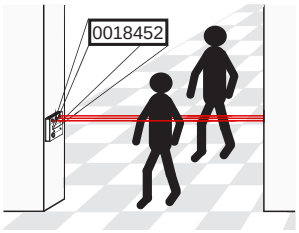
safety switching mats



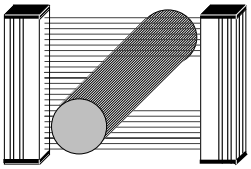
press brake protection



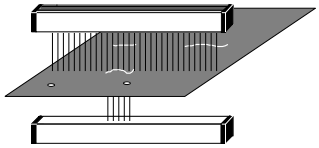
Analog loop sensor



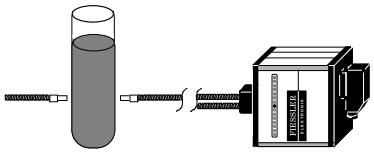
Counting barriers



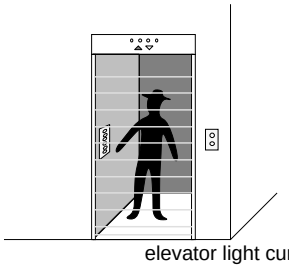
switching and measuring light curtain



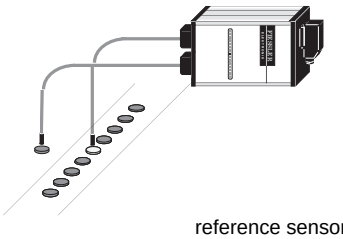
hole seeking device



turbidity sensors

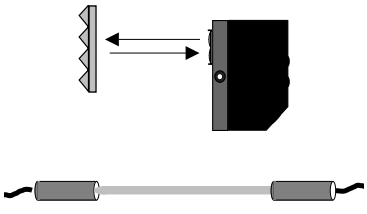


elevator light curtains



reference sensor

light barriers for EX-protected areas



light barriers for general applications

your application

Doku Nr. 608, 30.11.00 /DI