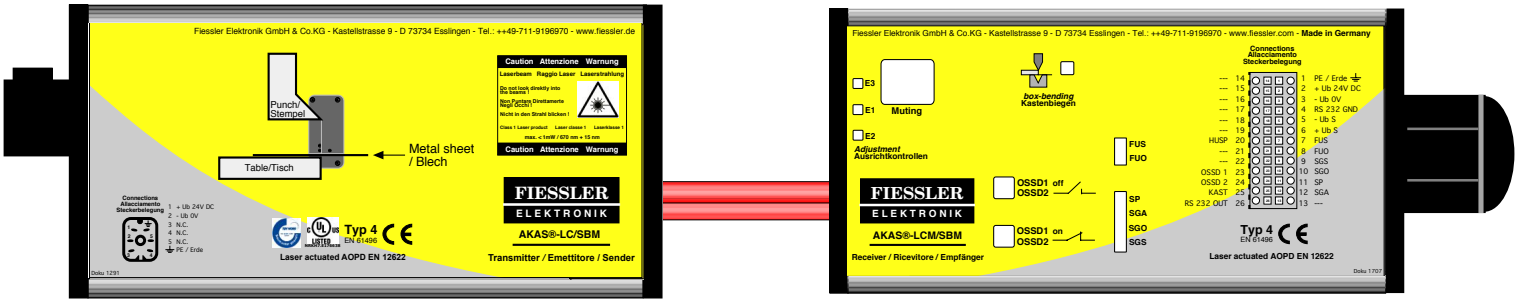
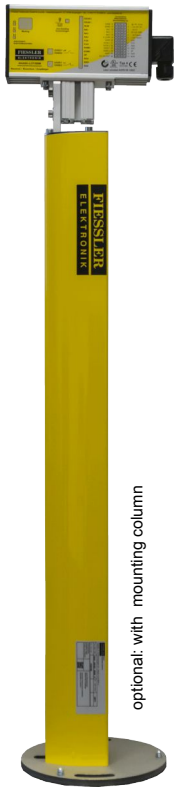
FIESSLER ELEKTRONIK

Folding Machine Protection System saftey category 4

AKAS®-LCM/SBM

Operating Instructions
translation





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CE

CONTENTS:

Doku Nr 1708 Stand 19.10.2017 / /Aui

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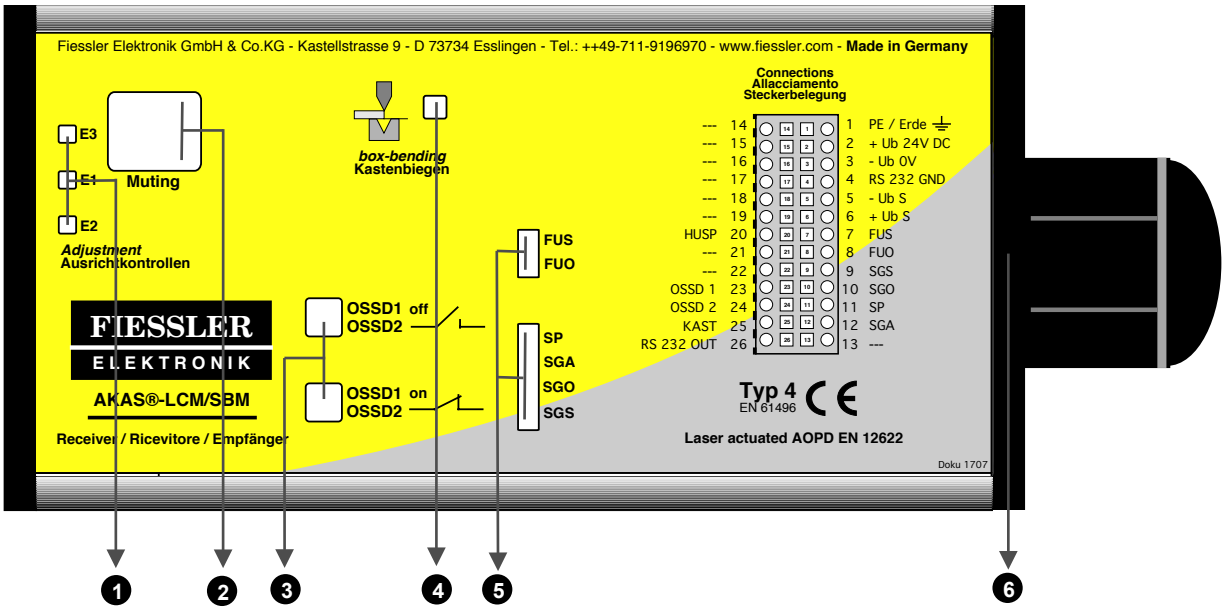
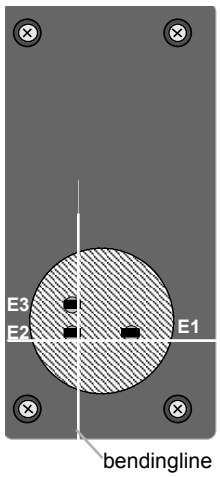
Contents

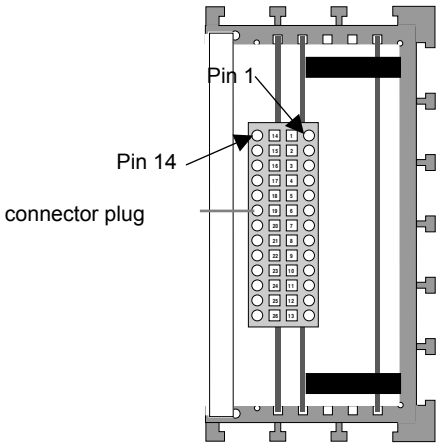
Doku Nr 1708 Stand 19.10.2017 / /Aui



view of the receiver elements

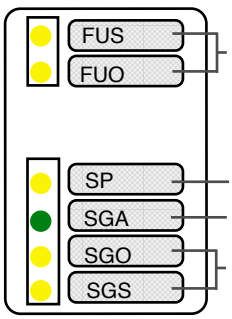


view after removing the connection lid on the receiver



1	ajustment controll-Leds of the receiver elements E1, E2, E3 LEDs are on if the beam does focus at all (see page 19)
2	integrated mutinglamp lamp is on if the protective field of the AKAS is not activated lamp is flashing if EDM- or SP-input-signals are wrong (see page 36)
3	LEDs for safety outputs (OSSDs, Fail-Safe PNP) red LEDs are on if the OSSDs are in OFF status green LEDs are on if the OSSDs are in ON status
4	LED is on if box bending funktion is activated
5	Indicator lights for in- and outputs
6	connection lid

5 **Indicator lights for in- and outputs**
(see page 36)



Inputs for press start / stop (release of closing stroke)

Input for safety point

Output for demand for slow speed

Input for position control in slow speed

Attention is drawn to all safety instructions by this symbol.

Particular attention must be paid to such instructions.
These operating instructions provide to the user important information concerning the correct use of the AKAS®. These instructions are a component of the light barrier concerned. It is essential that they are easily available at the location where the safety light barrier is installed. Before the initial operation of the AKAS®, all requirements detailed in these operating instructions must be observed. Other relevant regulations and the requirements of the employers' liability insurance associations have also to be complied with.

Mounting, initial operation and maintenance may only be performed by qualified persons.

Light barriers do not protect anybody from machine-caused flying objects.
The AKAS® protects fingers and hands that hold the sheet metal during the operation.
Therefore it does not protect during any fast engagement between the bending punch and the matrix short time before those are closed.
The protection function of the system is cancelled when the Muting lamp is on.
AKAS®-LCF/SBM does not protect the area between an upstand and the upper tool.
The front beam E1, which is located in front of the bending line, does not protect if the box-bending function has been activated. (see Fig. 4.2)
The pivotal movement of the bending beam is not monitored. (see Fig. 4.1)

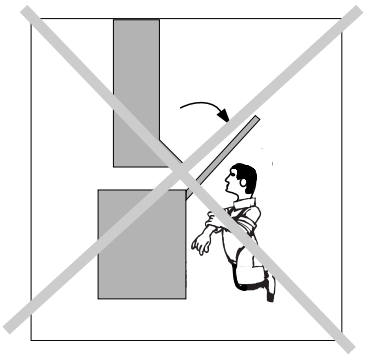


Fig.4.1

Injuries caused by the wheel of the bending beam (eg the risk of injury can be avoided by an additional light curtain)

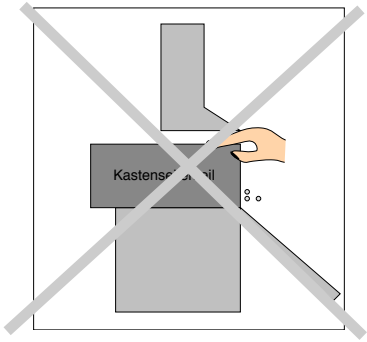


Fig.4.2

Hand injury when this is departing clamping tool on the raised edge.

1. **Use only tools with the same height in the same fixing on the press. All utilized tools must have one common bending line.**

2. **Attacks are mounted on the lower die, do not allow a downward movement.**

3. **The maximum allowable overrun traverse of the machine: 6mm / AKAS®-LC...**

The machine should have an automated overrun traverse control for the first stroke. If not, it can be realised by the AKAS®-...F and a cam controller or by the Fiessler AMS-system . Before the initial start-up, the overrun traverse must be checked either by using the test rod or by using an Overrun Traverse measuring device. (upon customer's request, Fiessler Elektronik will perform the Overrun Traverse Measuring on the customer's machine.) **If one results of 10 consecutive measurements is larger than 6mm / AKAS®-LC... , the fast speed must be reduced.**

4. **Muting signal** If a light beam is interrupted by the clumping tool, the AKAS® would stop the working stroke immediately. Therefore the AKAS® must be muted before it gets interrupted by the clumping tool. To prevent an accidental disconnection of the labor movement, from an opening of ≤ 15 mm (**AKAS®-LC...**) the control system of the machine must send a Mutingsignal to the reciever.. **Then the control system of the machine must reliably guarantee according to safety category 4, that from this time the stroke speed is < 10 mm/s**.

5. **The protection of a folding machine by the AKAS® does not permit bending in the bottom of a box inside the box in fast speed.**

6. **The AKAS® does not protect:**

-if the machine is only run in the work speed
-AKAS will be interrupted during fast speed and the stroke wil be continued
-if the overrun traverse of the press brake is too long
-from squeezing during the bending operation
-if the mutinglamp is constantly on

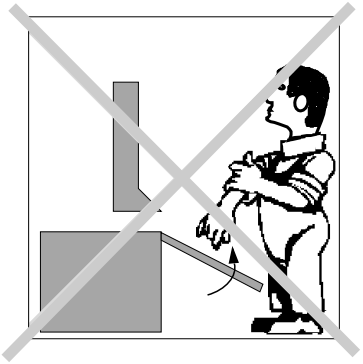


Fig. 5.1

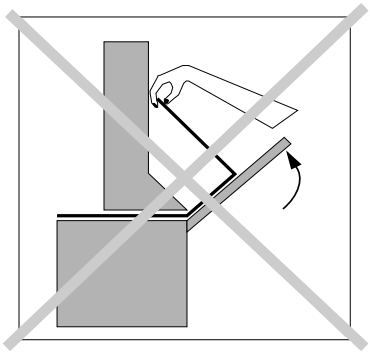


Fig. 5.2

7. **The hazardous state of the machine must be terminated by the sensor function.**

8. **The safety level (class 4) of the accident preventing light barrier should at least correspond to the safety level of the control system of the machine.**

9. **Laser beams may be deviated due to air currents, this may cause unwanted and unforeseen machine stops. Therefore the machine must be erected at a place free of air currents.**

Acceptance

Acceptance test: the installation acceptance test and inspections should be carried out by a competent person in possession of all the information supplied by the manufacturer of the machine and the ESPE.
Upon customer's request, Fiessler Elektronik will perform the initial acceptance as well as the annual test. Additionally, customer training seminars on how to execute annual tests will be conducted at regular intervals.

Annual Inspection

The machine owner must make sure that a competent person is assigned to check the light barrier annually. This person can be an employee either from the light-barrier manufacturer or from the operator's staff.

The laser - accident preventing light barrier AKAS® is an electro sensitive protective and controlling device (ESPE) which has the function to protect operators from accidents.
This happens as follows : Before a part of the body is squeezed between two opposed moving machine parts, this part of the body interrupts at least one light beam. By this means the movement of the machine is stopped, before it comes to an injury.

AKAS®

- meets EN61496-1 and CLC/TS 61496-2 Typ4; ENISO13849 PL e, Kat4, MTTF>300y; EN62061 SIL3, PFH2, 38 E-10 1/h
- is self- monitoring without additionally wiring.
- easy to adjust after tool changing.

Operative range for the laser-accident preventing light barrier of the AKAS®-LCF/SBM types are:
folding machines.

Max. range: **12m**

Mounting example: AKAS®-LCM/SBM

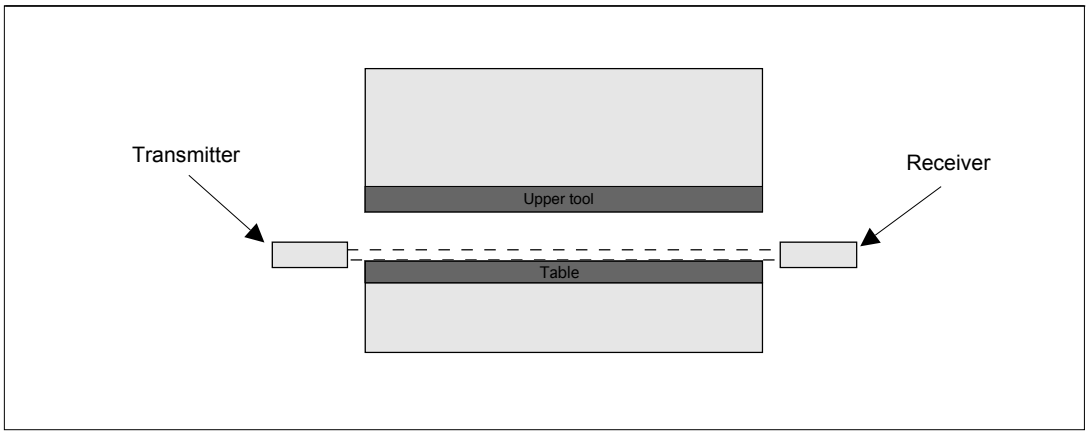


Fig. 6.1

Serial Numbers AKAS®-LC… The serial numbers are located at the down side of the housings of both AKAS®-LC/SBM transmitter and AKAS®-LC/SBM receiver.

	systems <u>without</u> operating mode selection operation only with additional safety PLC (e.g. **FPSC**)	
Functions / Characteristics	**AKAS®-LCM/SBM**	
max. Overrun Traverse of the press brake	15 mm	
recommended turnover point from fast speed into slow speed (according to overrun traverse of the press) Distance between metal sheet and bending punch)	15mm	
Detecting beams / Receiver elements	1 / 3	
Inputs		
Overruntraverse control NLW	-	
3 inputs for control of doors / emergency-OFF-circuit NA1, NA2, NA 3 for paired use 1 pair lateral door circuit, equivalent or antivalent, 1 pair rear door circuit , equivalent or antivalent, 1 pair emergency-OFF-circuit s	-	
Stopp contactor control EDMO, EDMS	-	
data of traverse in slow speed SGW	-	
start / stop of closing stroke FUS, FUO	2 equivalent	
position control in slow speed SGO, SGS	2	
selection of box bending KAST	1	
safety point SP	1	
Outputs		
Safety outputs for release of closing stroke OSSD1, OSSD2	2	
release and Emergency OFF of the rear stoppers RXOK1, RXOK2	-	
box bending function is displayed HUSP	1	
output for messages RS 232 TXD	1	
demand for slow speed SGA	1	

Principle of function bending of flat sheet metal

1. Release the closing movement by activating the foot pedal.

2. Machine closes in **fast speed (> 10mm/s)**

AKAS®-LCM/SBM

change-over point from fast into slow speed: 15 mm

receiver elements:

E1, E2, E3 active (protection)

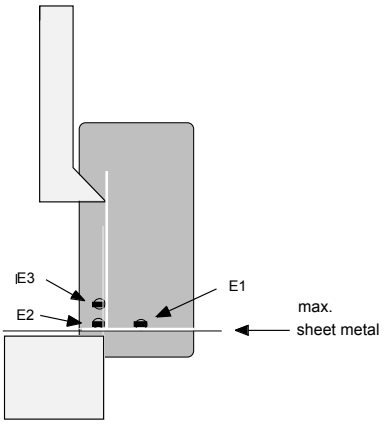


Fig. 8.1

3. After reaching the change-over point from fast speed to **slow speed (= 10 mm/s)** :

AKAS®-LCM/SBM

E3 is deactivated

E1 u. E2 remain activated for 0,6s

(6 mm) more (protection)

4. All Receiver elements are muted and the muting lamp is on. The bending procedure is finished.
(The fast speed mode and the slow speed mode are limited of about 2 min.)

Advice: Caution! Use only tools with equal overall height within one fixing.

Bending of wavy sheet metal

Closing movement with interrupted protective field

The AKAS® system offers the possibility to execute a closing movement under monitored slow speed even when the protective field is interrupted by a wavy sheet metal.
After the interruption of the protecfive field and the release and reactivation of the foot pedal, the AKAS will deactivate the SGA output when the protective field is interrupted. By this, only slow speed will be enabled by the machine control (NC).
AKAS® provides a reaction time of about 200ms for the machine control and then activated the safety switching outputs for the closing movement (OSSDs). The OSSDs remain activated as long as the AKAS® receives a slow speed message to SGS and SGO within the next 70 ms + the selected enhanced tolerance. A tolderance enhancement is possible only with the AKAS® .....F systems.

Function principle box bending

1. "Box Bending" is activated by the box bending button. The signal at the box bending input KAST must be high (+24V) for at least 100 ms and after that low (0V) for at least 100 ms.
(The box bending function can be canceled by twice activating the box bending button again)

2. AKAS® confirms the selection of the box bending by activating the output HUSP and the LED *box-bending*

AKAS®-LCM/SBM

change-over point from fast into slow speed:
same as for bending of flat sheet metals
receiver elements:
E1 not activated
E2, E3 activated (protection)

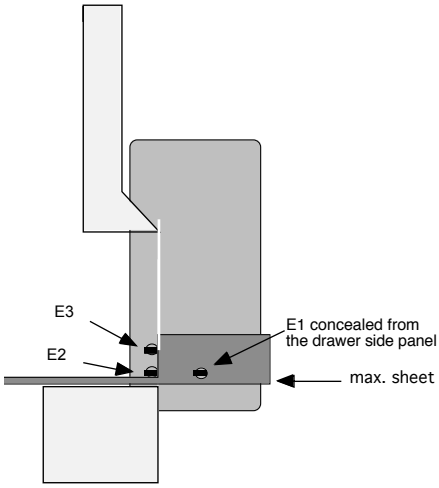


Fig. 9.1

3. Release the closing movement by activating the foot pedal. The press closes in **fast speed (> 10mm/s).**

4. After reaching the change-over point from fast speed to **slow speed (= 10 mm/s)** :

AKAS®-LCM/SBM

E3 is deactivated
E2 remain activated for 0,6s (6mm) more (protection)

5. All Receiver elements are muted and the muting lamp is on. The bending procedure is finished.
(The fast speed mode and the slow speed mode are limited of about 2 min.)

6. After the bending procedure the box bending function is cancelled.

Bending of very small pieces

In the case of bending of very small pieces, which must be guided by the fingers, the box-bending function must be selected. Otherwise, the fingers would interrupt E1, which would lead to the switching off of the bending process !
With activated box-bending function, a finger which is placed next to the slog on a large matrix, is <u>not</u> detected!!

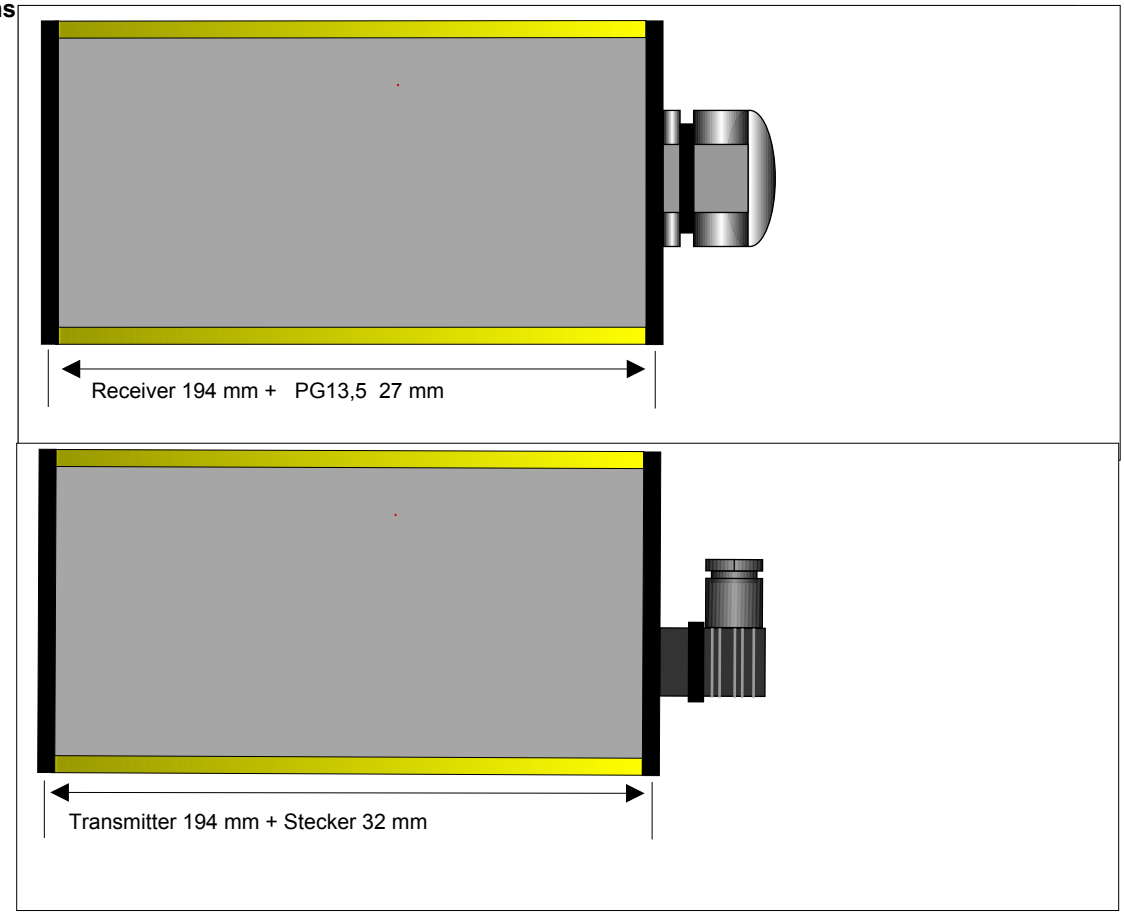
housing type The aluminium housing of both transmitter and receiver are powder coated in silver.
The optical head is made of acid-resistant spherically reinforced plastic (polyamide).

fastening fastening with shifting tenon blocks at the three side of transmitter and receiver housings

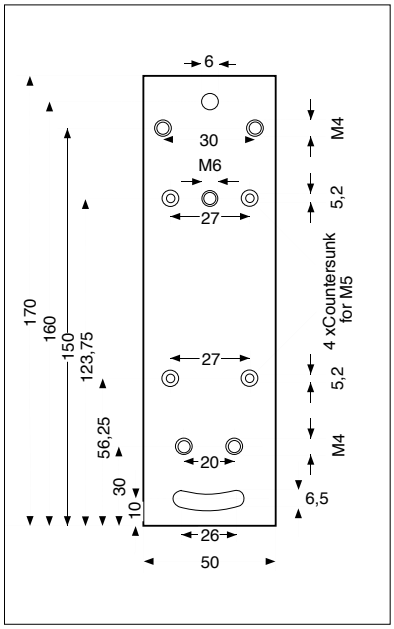
weight: transmitter: 0,7 KG, receiver 0,54 KG

Max. range: 12m

dimensions



mounting bracket



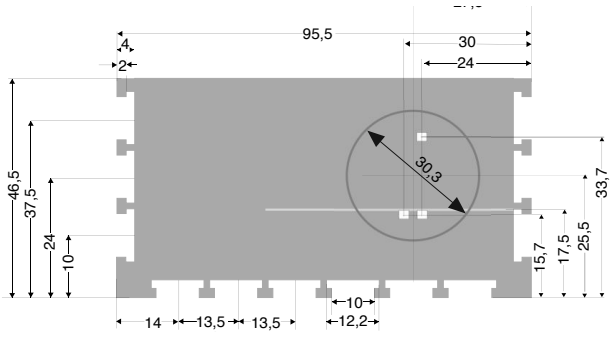


Fig. 10.2

How to proceed: Step by step mounting the AKAS®

1	Overrun traverse measurement
2	Design of the mechanical holders
3	Mounting of the holders at the matrix
4	Mounting of the AKAS® on the holders
5	Connection of the AKAS® / Selection of the operating mode
6	Adjustment of the AKAS® during first installation
7	Function Verification of all electrical connections in view of the safety classs 4 requirements
8	Self-acting Overrun Traverse Test

1. Overrun Traverse Measurement

The machine should have an automated overrun traverse control for the first stroke. If not, it can be realised by the AKAS®-...F and a cam controller or by the Fiessler AMS-system . Before the initial start-up, the overrun traverse must be checked either by using the test rod or by using an Overrun Traverse measuring device.

(upon customer's request, Fiessler Elektronik will perform the Overrun Traverse Measuring on the customer's machine.)

If the results of 10 consecutive measurements are larger than 6mm AKAS®-LCM/SBM, the fast speed must be reduced.

2. design of the holders

- The dimensions of the self-supplied holders must be individually laid out according to the dimensions of the machine.
- If frequent tool change requires the presence of a swivable holder, this should be installed at the receiver arm, in order to leave the precise adjustment of the transmitter arm unchanged.

3. Mounting of the holders at the matrix

a) The holders must be mounted at the matrix in a way that the marks on transmitter and receiver correspond exaclty to the bending line. The receiver element E1 must face to the operator.
b) The lowest edge of both housings must be at the same level.

please observe!

Transmitter and receiver of the AKAS® must not be subject to mechanical stress (e.g. bottles must not be placed on it). To prevent this and to protect the AKAS® from any damages, a solid protection cap should be always mounted.

4. Mounting the AKAS® on self-supplied holders

fastening bracket with tenon blocks at the rear

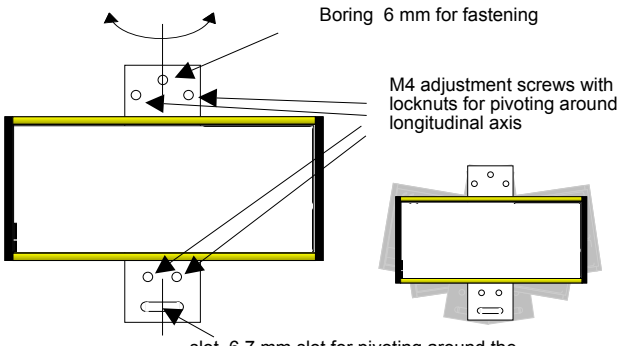


Fig. 12.1

To guarantee a trouble-free operation, both the receiver and the transmitter must be fixed at solid, deformation-free plane-parallel constructions at the matrix.

The adjustment screws must be easily accessible. Pay attention to avoid any deformation of the profile.

When pivoting around the longitudinal axis, the locknuts of each M 6 screw at the angle bracket should be loosened.

There are additional fastening possibilities with shifting tenon blocks at the three side of transmitter and receiver housings.

5. Connecting the AKAS®

Wiring diagrams are shown in chapter 6 **Electrical connections.**

Choose the operating mode at ...F series

The functions are described in chapter **6.3**
The position of the Hex switches is described in chapter **6.5.2.**

6. Adjustment of the AKAS® at the first installation

AKAS®-LCM/SBM

To guarantee a trouble-free operation, the mecanical fixtions of both the receiver and the transmitter must be fixed at solid, deformation-free plane-parallel constructions at the matrix.

The fastening brackets are designed for the fastening and adjustment of the AKAS®-LCM/SBM.

Together with the sliding tenein blocks, the brackets allow a universal fastening.

Transmitter and receiver must be mounted in a way that,the marks for maximum sheet metals thickness (6mm) and the bending line are mounted on the receiver front.

The receiver and the transmitter must be swiveled around the longitudinal axis in a way that their housings are plane parallel to the matrix. With pivoting around the longitudinal axis, the adjustment screw or the locknut that counteracts the screwing movements, must be loosened.

adjustment of the receiver

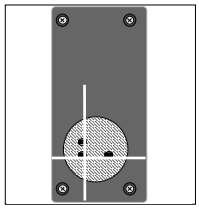
Drop a perpendicular from the bending line of the bending punch and adjust optically the receiver with the the help of M4 adjustment screws so that the mark (centre of the receiver elements) is located vertically at the front of the receiver.

The top of the max thick of the plate on the table must be located on the same level as on the mark on the receiving end

adjustment of the transmitter

The transmitter must be mounted in a way that its marks are located perpendicularly to the bending line, the same way as the receiver is positioned and is at the height of the marked maximum thickness (up to 6mm).

The red transmitting beams should meet the receiver like it is shown in the below illustration.

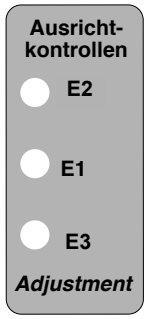


Caution!

Should Plates > 6mm thickness can be clamped, then the AKAS be further adjusted upward. In this case, a finger >8mm thickness directly on the table are not detected, and the finger is not protected when a sheet metal is clamped with a lower strength!

adjustment control - LEDs

synchronization transmitter - receiver	AKAS®-LC…
transmitter-beam does focus at all	E...on
transmitter-beam does not focus precisely	E...partially off
transmitter-beam does not focus at all	E...off



⚠ **Advise!**

AKAS®-LCM: E3, E1, E2
LEDs are flashing slowly about once per second: Machine has successfully stopped at the cam during the overrun traverse test, only when the cam is free again, the OSSDs can be enabled again.
The ajustment controll-LEDs are flashing slowly until the machine is not opened completely.

7. adjustment AKAS ® transmitter and receiver -LCM/SBM must be firmly attached to the matrix. (see Chapter 5.2)

The tip of the punch must be located on the bend line.

The upper edge of the thick plate potential (maximum 6 mm) is positioned in the amount of the marker.

Then align the laser transmitter so that the laser beam parallel to the upper beam runs and hits the receiver. (Figure see p. 13)

Caution!

⚠

Should Plates > 6mm thickness can be clamped, then the AKAS be further adjusted upward. In this case, a finger >8mm thickness directly on the table are not detected, and the finger is not protected when a sheet metal is clamped with a lower strength!

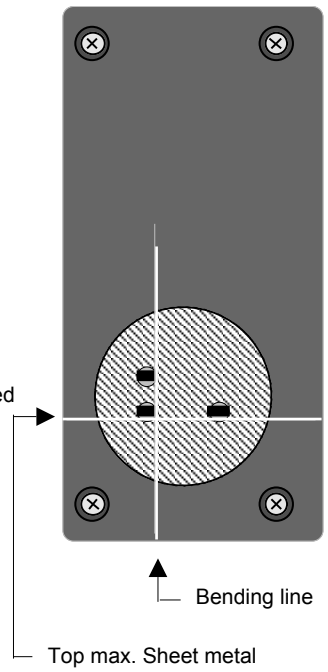
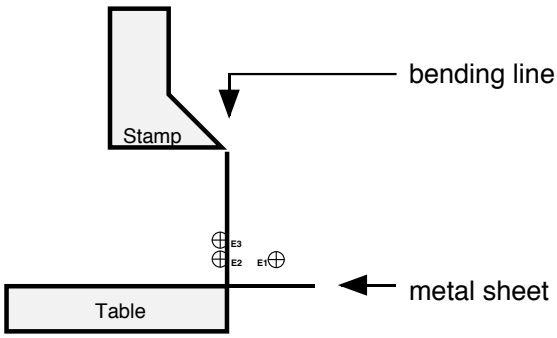


Fig. 15.1

SP, SGS = 0
SGO = 0

Fast speed



SP, SGS = 1
SGO = 1

Switching point
Fast speed/slow speed

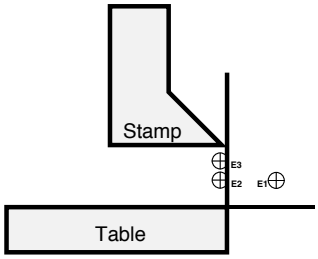


Fig. 15.2

8. Verification of all electrical connections referring to safety class 4

see chapter **6 Electrical connections**

9. Automatic overrun traverse tes

According to prEN 12622, the overrun traverse of the machine should be verified automatically at the first stroke after its connection to power of the press brake or of the AKAS® and it must be repeated at least after 30 h, if the machine remains connected to power for a longer period of time.

The overrum traverse test is carried out after every voltage reset and must be repeated every 24 hours. After the successful overrun traverse test, the press must be at first opened for the execution of one bending stroke. The ajustment controll-LEDs are flashing slowly until the press brake is not opened completely.

If the overrun traverse control is not carried out by the AKAS®, the machine control must carry out an overrun traverse test at least after a voltage reset. This overrun traverse test must be repeated within the next 30 hours.

Electrical data	
safety class	EN61496-1 and CLC/TS 61496-2 Typ4; ENISO13849 PL e, Kat4, MTTF>300y; EN62061 SIL3, PFH2, 38 E-10 1/h
operation voltage	24 V DC, +/- 20 %, SELV
max. power cunsumption	(no charge)**:** max. 2,0 A, AKAS....LC: 0,5 A
protection from incorrect con.	Protection against all possibilities of errors is not provided.
protection class	III
electrical connection	transmitter: **AKAS®-LC...:** angular plug receiver: integrated plug-in connector with M 32 as strain relief
connecting cables	transmitter: **AKAS®-LC...:** core max. 1 mm receiver: **AKAS®-LC...:** max. 1 mm
cable arrangement	Cables to be laid separately from high-voltage cables. The cable laying must be arranged in a way that no mechanical damage of the cable is possible. For that reason the cable must be installed in a reinforced hose if not protected by the machine.
outputs	OSSD 1 and 2: Fail-Safe PNP outputs , max. 0,5A, with short-cut and side-current monitoring RXOK1 and 2: PNP-outputs with short-cut and side-current monitoring during switching on, max. 0,5 A SGA , HUSP, SEU2K, KAST (KAST: only when using the external muting lamp): PNP-outputs max. 0,5A TXD: RS 232 serial interface
inputs	FUO, FUS, SGO, SGS, SP, EDMO, EDMS, NA1, NA2, NA 3, NLW: 0 V / 24V DC +/- 20 %, 10 mA KAST: : 0 V / 24V DC +/- 20 %, 25 mA
response times	1,5 ms between the interruption of a light beam and the disabling of the OSSDs 10 ms between the release of the foot pedal orthe opening of a protective circuit and the disabling of the OSSDs 10 ms between the opering of a protective circuit and disabling of the release of the rear stoppers RXOK1 & -2 2,6 ms between the opeing of the overrun traverse cam switch and the disabling of the OSSDs during the overrun traverse test
time windows for the input signals (basic tolerances)	switch-over from stopped state into closing state after enabling of the OSSDs : 300 ms (only with operatiing mode with contactor/valve control EDM). switch-over into slow speed state when the start is carried out within the range of the safety point (at SP = 1): 100 ms after detection of the closing movement state by the EDM, i.e. 100 ms after enabling of the OSSDs when the press is operating without the EDM. switch-over into fast speed when the start of the press is outside the range of the safety point (at SP = 0): 100 ms after detection of the closing movement state by the EDM, i.e. 100 ms after enabling of the OSSDs when the press is operating without the EDM. switch-over into slow speed state when the start of the press with slow speed request (200 ms after SGA = 0 has been transmitted to NC): 70 ms after detection of the the closing movement state by the EDM, i.e. 70 ms after enabling of the OSSDs when the press is operating without the EDM.
Tolerance enhancement	only with **AKAS®-...F**: max. 300 ms
environmental data	
ambient operation temp.	0° to 50° C
storage temperature	-25° to 70° C

Caution!! The use of both AKAS® ...**without F** series and the AKAS®...**with F** series adjusted to "operation with connection to an additional safety PLC" receiver is only permitted in combination with an additional safety PLC (e.g. **FPSC**) which provides the safe fast speed-/slow speed signals and closing request signals via cables with short-cut and side-currant monitoring and which provides a safe processing of the OSSD-Signals of the AKAS®.

Caution!!! Only if the accident preventing light barrier AKAS® has been installed according to the operating instructions and connected according to the wiring diagrams, and if all relevant national and international accident prevention/safety regulations are observed , a safe operation is ensured !

Any modification of the specified circuits can cause hazardous states and is therefore forbidden.

If the press does not posssess any position-monitored contactors for the seitch-over from fast speed into slow speed, a safe integration is possible using the Fiessler **AMS-System.**

Muting signal

Muting signal from the machine control system:
(Mutingsignal available from the contactor position control of the working stroke valve, from the pressure switch or from the AMS)
The muting signal out of the machine control must be laid out in a way that no muting signal is given to AKAS® if there is any malfunction of the involved switching elements (i.e. no release of a contactor or no switching over from fast motion into working motion) !

set up operation

The set up operation has to be carried out according to the description in chapter 6.5.1 function 7 on the AKAS ....F systems, or the AKAS® must be switched off, the safety outputs of the AKAS® (OSSDs) must be muted, and the fast speed closing speed must be reliably excluded.
After the set up operation it must be made sure that this special muting of the OSSDs is cancelled.

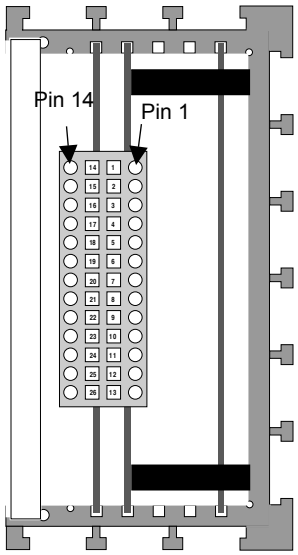
Checklist

		OK
1	AKAS® is used on "foot operated fast motion" mode.	
2	"Foot operated fast motion" should only be possible with activated AKAS®	
3	During foot operated motion with AKAS®, the downward movement should only happen by pressing the foot pedal .	
4	The valves relevant for the downward movement must be triggered as directly as possible by the Fail-Safe PNP outputs OSSD1 and OSSD2 to keep the overrun traverse as short as possible	
5	In all operating modes except "Foot operated fast motion" the AKAS® must be disconnected from the power supply (=switched off).	
6	The machine control system issues a muting signal with AKAS®-LC...: 15mm above the slug. (Mutingsignal coming from the contactor position control of the working stroke valve, from the pressure switch or from the AMS)	
7	The machine control system prevents the fast speed during the closing movement if no static signal is given (SGA). This function of the press must not be necessarily safety-orientated.	
8	When the muting signal is given, it must be guaranteed according to safety class 4 that the stroke of the machine is < 10mm/s.	
9	The box-bending function must be chosen and acknowledged by a button (change-over contact). Here a pedal is more advantageous, because by using it both hands stay free to hold the	
10	After a voltage reset, an overrun traverse test is carried out.	
11	The overrun traverse is smaller than 6mm at the AKAS®-LC...	

function

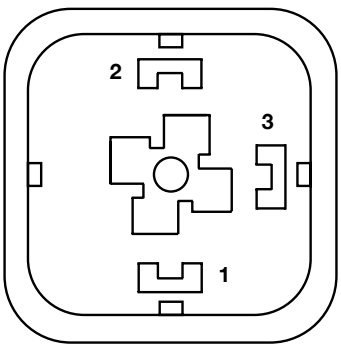
- protection of the operator from being squeezed between the ram and the matrix (all other safety monitoring functions are carried out by a safety control (e.g. safety PLC **FPSC**).
- The **safety PLC** gives a safe signal to the **AKAS®** inputs **FUS** and **FUO** , if a closing movement is ab out to be performed, and another **safe signal** is given to **SGO**, **SGS** and **SP** , if the press closes safely at slow speed. For this, **the signal lines must be monitored for eventual short-circuits by the safety PLC.**
- The safety PLC evaluates the safety outputs OSSD1 and OSSD2 of the AKAS® and stops the closing movement, if there is no signal from the OSSDs.
- The machine control system must carry out an overrun traverse test of the press at least after every voltage reset, and this test must be repeated at least within the next 30 h. By doing this, the overrun traverse must not exceed the value of 10 mm at the **AKAS®-LCM/SBM .**

terminal
receiver



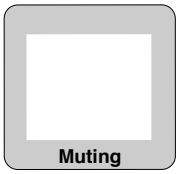
		Terminals of the receiver	
Nr	**designation**	**meaning**	**signal level**
1	Erde	functional ground	
2	+Ub 24VDC	power supply voltage	
3	-Ub 0V	power supply voltage	
4	RS 232 GND	Meldeausgang (Status-/Fehlermeldung)	
5	-Ub Sender	connection for -Ub AKAS-transmitter	
6	+Ub Sender	connection for +Ub AKAS-transmitte / key-operated switchfor adjustment	+24V if FUS is triggered or key-operated switch is on
7	FUS	input **Start / Stop closing stroke**	0V Press brake stop +24V Press brake close (inputs equi-valent)
8	FUO	input **Start / Stop closing stroke**	0V Press brake stop +24V Press brake close
9	SGS	input **slow speed position**	0V: at fast speed +24V: at slow speed (inputs equi-valent)
10	SGO	input **slow speed position**	0V: at fast spoed +24V: at slow speed
11	SP	input **safety point**	0V: within fast speed range +24V: within slow speed range
12	SGA	output **slow speed request by AKAS**	0V only slow speed permitted +24V fast-/slow speed possible
20	HUSP	output **message of box bending function**	+24V if box-bending is selected
23	OSSD1	safety output **release of closing stroke**	+24V if released
24	OSSD2	safety output **release of closing stroke**	+24V if released
25	KAST	input **box bending**	+24V pulse min. 100 ms
26	RS 232 out	output message (State-/error)	

transmitter



Terminals of the transmitter		
Nr	**designation**	**meaning**
1	+S	+Ub transmitter
2	-S	-Ub transmitter
3	Erde	functional ground

Displaying of conditions by the Muting lamp



lamp is out (flashing is hardly recognizable) : during the closing movement the proitective field is at least partially avctivated

lamp is constantly on: The protective field of the AKAS® ist not activated. AKAS® only permits closing strokes in slow speed.

The lamp is flashing slowly : about once per second: EDM is not in Stop condition, or the rear reset button must be released, or the press brake must be opened completely in order to quit the slow speed range to enbable the triggering of SP = 0.

The lamp is flashing rapidly: about five times per second: AKAS® is in interlock state. Carry out a voltage reset.

Displaying of conditions by the Ajustment control-LEDs

see also page 14

LEDs are flashing slowly about once per second: Press has successfully stopped at the cam during the overrun traverse test, only when the cam is free again, the OSSDs can be enabled again. The ajustment controll-LEDs are flashing slowly until the machine is not opened completely.

AKAS®-LCM/SBM
E3, E1, E2

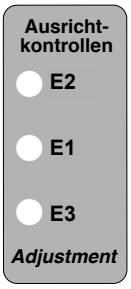
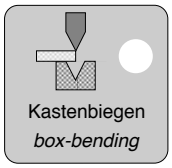
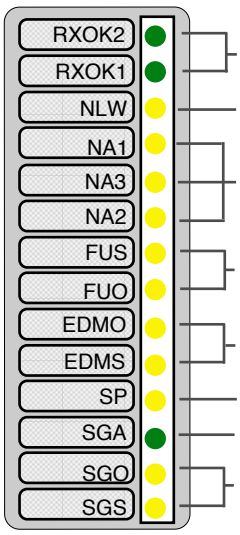


Fig. 28.1

Indicator LEDs



LED is on if box bending funktion is activated



Indicator LEDs for in- and outputs	AKAS®- ...M
Outputs for release of rear stoppers	-
Input for Overruntraverse controll	-
Inputs for control of protective grids or doors and emergency-off circuits	-
Inputs for press start / stop (release of closing stroke)	antivalent inputs: FUS is lit, FUO is dark if foot pedal is activated. equivalent inputs: FUS /FUO are lit if foot pedal is activated.
Input for stop contactor control	-
Input for safety point	SP is lit if safety point is reached
Output for demand for slow speed	SGA is lit if fast speed is permitted
Input for position control in slow speed	antivalent inputs: SGS is lit, SGO is dark during slow speed equivalent inputs: SGS / SGO are lit during slow speed

Service

If you have questions that cannot be answered by reading this operation instruction manual, please contact us directly.

When calling, please have the following dara ready:

-Exact unit type and model
-Serial number(s)
-Symptom of the malfunction and/or fault description

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

Phone: 0711 / 91 96 97 - 0
Fax: 0711 / 91 96 97 - 50
E-mail info@fiessler.de

Maintenance

The transmitter- and receiver lenses should be cleaned with a soft cotton swab at least once a month.
The spindle of the support should be lubricated with machine oil after 6 months.
The press brake protection systems AKAS® are maintenance-free with the exception of the supports.
On request by the customer, Fiessler Elektronik GmbH & Co. KG carries out the acceptance test and annual inspections.
In addition, seminars providing customers with training in annual inspections are held at regular intervals.

Warranty

The company Fiessler Elektronik GmbH & Co. KG refuses to accept any warranty claims if the device has been opened or if it has been modified.

Returning a unit

If, in the case of default, the necessity of returning the unit to Fiessler Elektronik arises, it will be very advantageous for a fast default diagnosis if the following topics are observed and observed:

-exact description of malfunction:
-did you frequently notice malfunctions at the machine where the light curtains are installed?
-any defaults or malfunctions in the past?
-etc..
-which operating mode has been used with this unit?

The more exactly the malfunction is described, the more accurate and faster we can determine it and repair it.

AKAS® accessories (electronic equipment)

part designation	order code
AKAS® Muting System w. integrated overrun traverse control AMS/N, complete (incl. 2 magnetic sensors with 10m & 5m cables, 1 magnetic tape)	**AMS/N/K**
Safety double foot pedal FL2-528ZSD4-U	**FS2-528ZSD4-U**
AKAS® Foot pedal for box-bending function	**AKAS/Ped**
Mounting column for Safeguards for Folding Machines AKAS-LCF-SBM for transmitter	**Sau_AKAS_SBM_S**
Mounting column for Safeguards for Folding Machines AKAS-LCF-SBM for receiver	**Sau_AKAS_SBM_E**

Electrosensitive protective equipement The press brake protection AKAS® is an electrosensitive protective device (ESPE).
ESPE is characterised by the fact that a hazardous motion becomes interrupted or prevented if the **light beams** produced between the transmitter and receiver unit are interrupted.

Safety category 4 The AKAS® fulfils the safety class 4, in compliance with EN 954.
Devices of safety category 4 are self-monitoring electrosensitive protective devices (ESPE) and represent the highest safety class among the ESPE

Self-monitoring The electrosensitive protective device (ESPE) switches automatically into the "safe state" when it is faulty.

Standard Installation range Maximum distance between transmitter and receiver is 12 m (For longer range please get in contact with Fiessler Elektronik or your local dealer).

Overrun The part of the hazardous motion still taking place after interrupting the light beam.

Overrun traverse The distance covered during the overrun (e.g. by the ram of a press).

Overrun period The duration of the overrun traverse.

Response time The time that elapsed after light beam interruption until the switching action occurs.

Valve or contactor control Before every release of the output contacts the contactor control is checking whether the switching elements connected (relays, contactors or valves) have been released. A renewed release of the output contacts is only possible if the switching elements connected have been released. Thus a dangerous failure of switching-elements (relays, contactors or valves) caused by the hazardous motion is prevented.

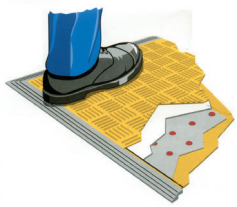
Start interlock After initial operation or after a power supply interruption a renewed "enabling" is blocked by the start interlock.The renewed release of the switching unit is only possible by closing and opening of the start entry.

Restart interlock The restart interlock prevents any automatic releasing of the switching outputs after an interruption and re-enabling of the light beam (e.g. when penetrating the light beam).

Muting Short-time safe by-pass of the press brake protection AKAS® during material movement, i.e. during a plate bending process.

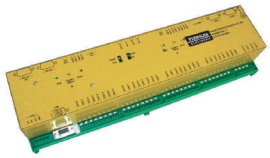
Box-bending By-pass of the receiver unit **E1**, during a box-bending process.

other Safety products



Saftety Mats

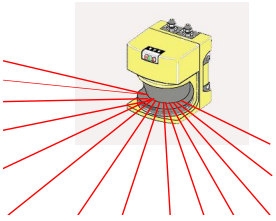
Safety-Footpedal



Parametricable Saftetycontrol FPSC

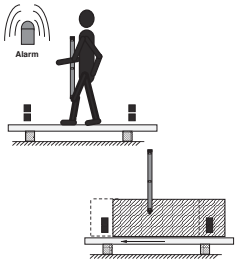
Press Brake Protection System AKAS

Safety-Light-Curtain

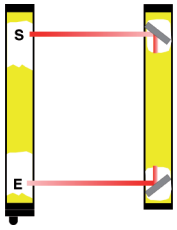


Proximity Laser Scanner

Single-Safety-Beam



Safety-Light-Grid with muting function



Safety-Light-Grid

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.

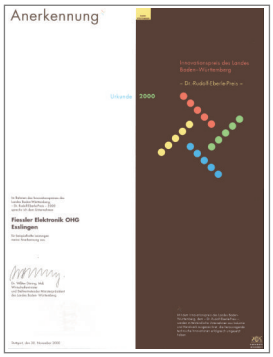
HOMOLOGATIONS

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 cooperation with the German employer`s liablility insurance associations. All homologations are obtained only after having passed strict tests by the German surveyor organisation TÜV.

CE BG zugelassen TÜV ZERT UL LISTED Ex

AWARD OF APPRECIATION

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



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Fiessler Elektronik has respresentations in all major industrial