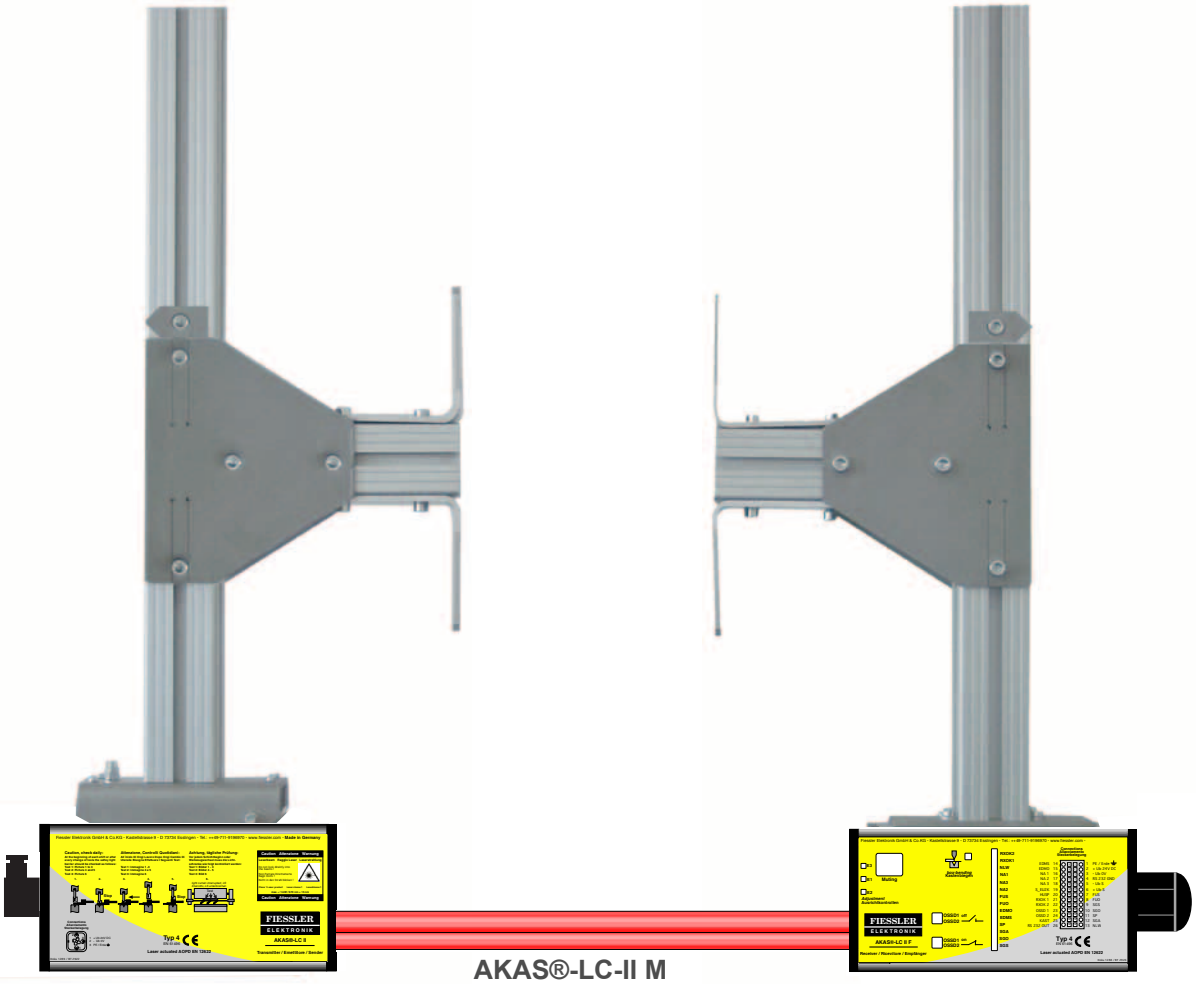
FIESSLER ELEKTRONIK

Press Brake Protection System safety category 4

AKAS®LC-II M
AKAS®LC-II F

Operating Instructions
translation



AKAS®-LC-II M
AKAS®-LC-II F

TÜV NORD CERT GmbH
Baumuster geprüft

EC type examination certified

Certified ISO 9001: 2008
ISO 9001
DIN EN ISO 9001 Zertifiziert

CE

CONTENTS:

Doku Nr. 995 Stand 20.7.2016 / Aui

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FIESSLER ELEKTRONIK

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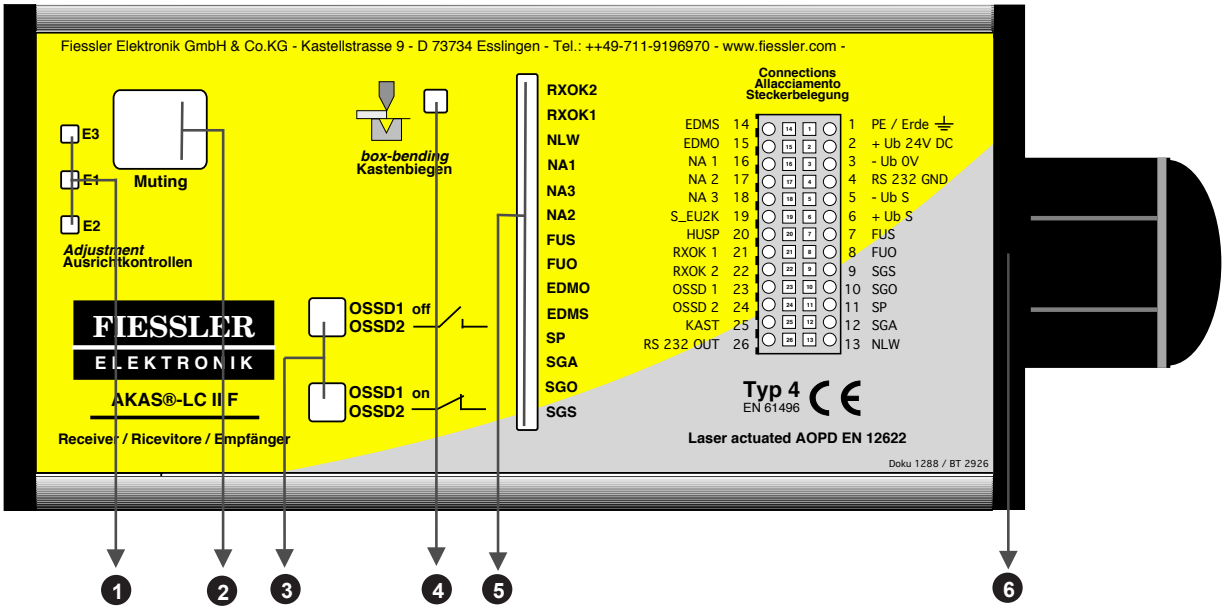
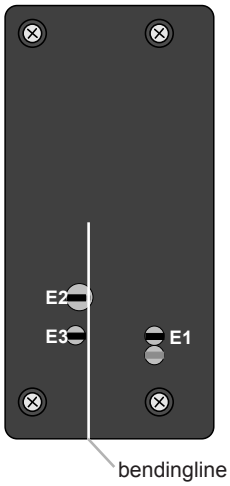
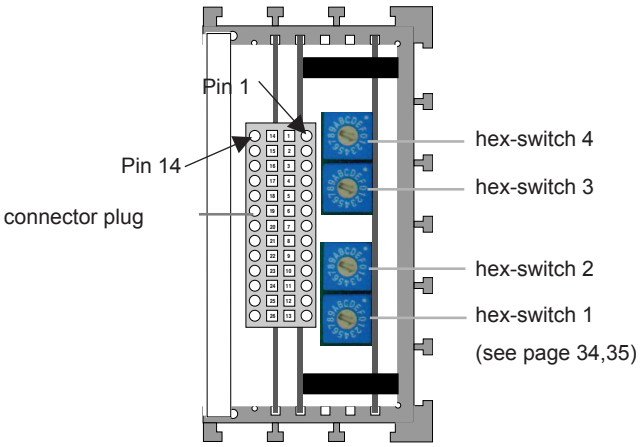


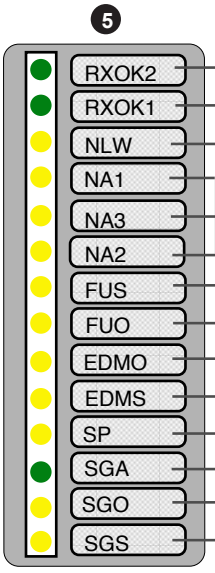
view of the receiver elements



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



Indicator lights for in- and outputs
(see page 36

Outputs for release of rear stoppers

Input for Overruntraverse controll

Inputs for control of protective grids or doors and emergency-off circuits

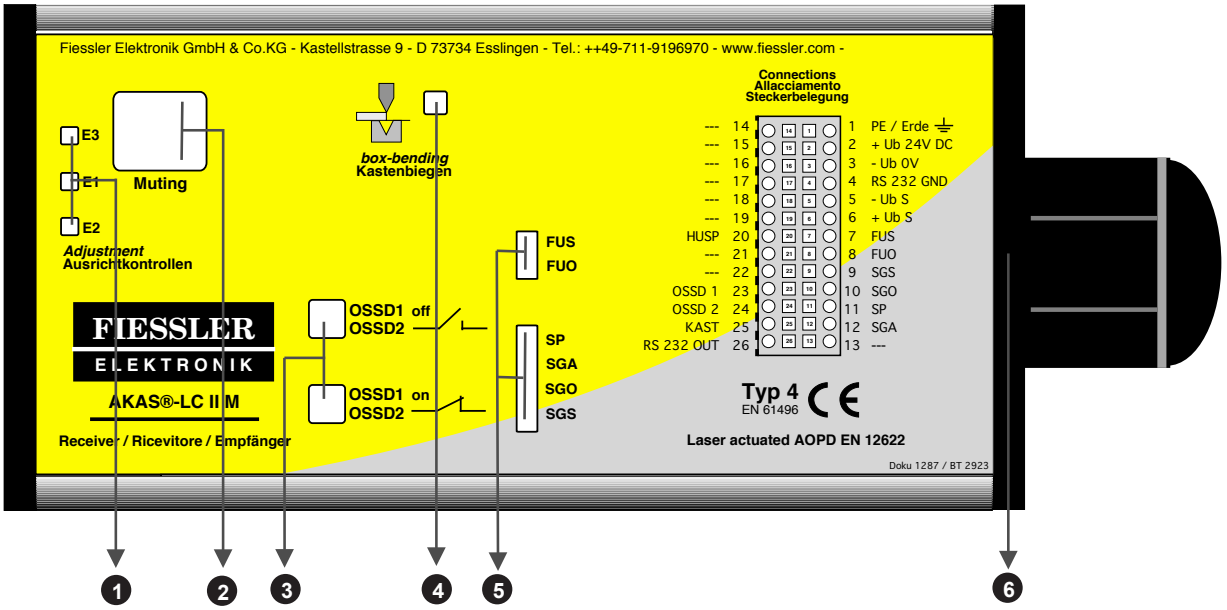
Inputs for press start / stop (release of closing stroke)

Input for stop contactor control

Input for safety point

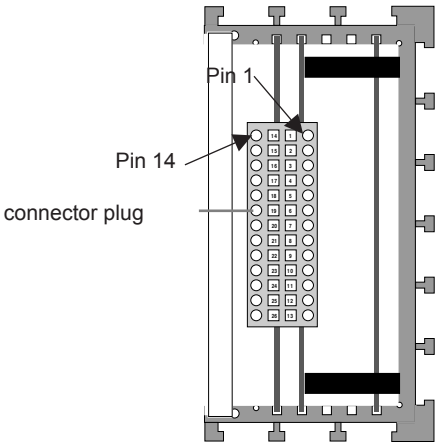
Output for demand for slow speed

Input for position control in slow speed



view of the receiver elements

view after removing the connection lid on the receiver



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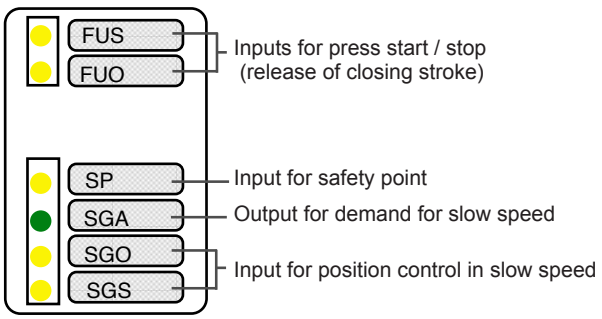
6	connection lid

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



This is the operating instruction for the AKAS® models AKAS®-LC IIM, AKAS®-LC IIF
Special instructions for each model are provided with its individual model marking.

Read the operating instructions

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.

Qualified Personnel

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

Safety warning

Light barriers do not protect anybody from machine-caused flying objects.
The AKAS® protects fingers and hands that hold the sheet 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.**

The front beams E1 which are turned to the operator before the bending line do not protect, if the box-bending function has been activated earlier.
With the integration of a AKAS ® safety system, the standard should be strictly complied with the European Standard (EN12622).
Protection circuits and Emergency can only stop the opening movement when the movement is interupted with the RXOK outputs.

A-Test: putting into operation

A-TEST when putting into operation

The setting must be done in a way that the following test will be passed:

!!! If either test A or B fails, the machine must not be used until the problem is resolved !!!

- **The B-Test must be done for safety reasons each 5 times on the left end and on the right end of the upper tool.**
- **The press brake must be equipped completely with the heaviest upper tool.**
- **Start of the closing movement from the maximum top dead centre (T.D.C)**

B-Test: daily check (at least every 24 hours)

At the beginning of each shift and after each change of tools, the AKAS® press brakes protection must be checked as follows (see also EN 12622):

Test must be carried out at both left and right ends of the bending punch.The punch must not touch the step-shaped test rod.

a.) Place the test piece in position "10" on the lower tool. Select the box bending function if you use a system of the AKAS®3... product family.

Now start the close down movement.

b.) The press brake stops.

c.) The test piece must be placed in position "15" under the upper tool. In this position ("15") the test piece may not touch the upper tool.

d.) Drive up the press brake. Place the the test piece in position "35" on the lower tool. Select the normal bending function if you use a system of the AKAS®3... product family.

Now start the close down movement.

e.) The press brake must be stopped in a way that the test piece ("35") may not touch the upper tool.

f.) Move the test piece ("14") along the tip of the upper tool. The AKAS®-II receiver has to remain in the interrupted (LS unterbrochen /interrupted = red LED) state.

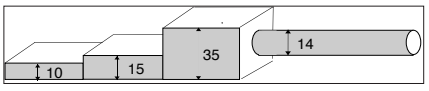


fig. 5/1

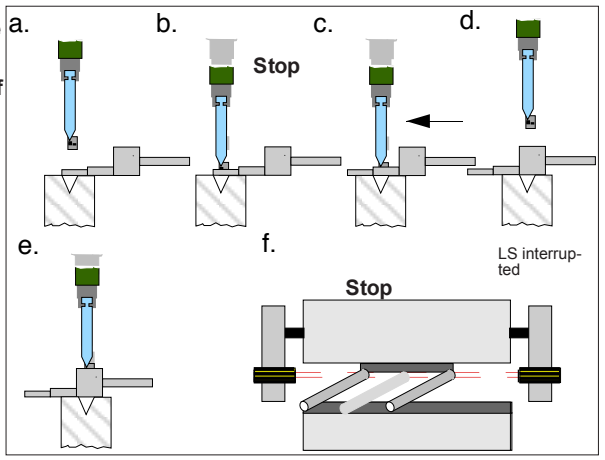


fig. 5/ 2

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. **According EN 12622 the press brake safety safety system AKAS® is designed specifically and only for the use of "V" type tools.**

3. **Stoppers, which are mounted at the matrix, lead to a premature switching-off of the downward movement.**

4. **The maximum allowable overrun traverse of the machine: 10mm bei AKAS®-LC II...**
The press must 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 (see page 5) 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 10mm the fast speed must be reduced.**

5. **Due to the missing sychronization during fast speed, AKAS® cannot be used for two machines aligned in parallel (e.g. "tandem press brake") .**

6. **Muting signal** If a light beam is interrupted by the sheet which is to be bent, the AKAS® would stop the working stroke immediately. Therefore the AKAS® must be muted before it gets interrupted by the sheet. Likewise, slightly uneven sheets should not lead either to an unintended switching-off of the cutting movement. From an opening of ≤ 13 - 22 mm (according to overrun traverse of the press) 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**.

7. **The protection of a pressbrake by the AKAS® does not permit a bending in the bottom of a box inside one box in fast speed.**

8. The AKAS® does not protect:

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

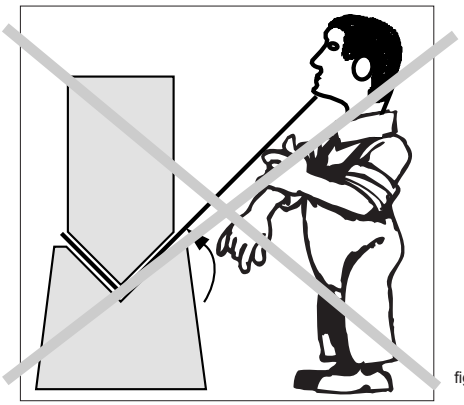


fig. 6/ 1

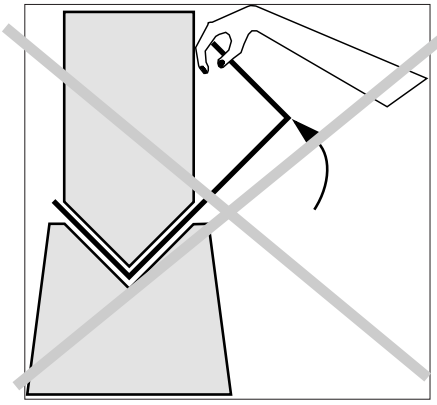


fig. 6/ 2

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

10. **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.**

11. **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.**

Produkt conformance

"Complies with 21CFR and 1040.10 and 1040.11".

"Caution! the use of controlss or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure."
Attention! L'utilisation de commandes ou de réglages ou l'exécution de procédures autres que ceux et celles spécifiés dans le présent manuel risque d'entraîner une radioexposition dangereuse.

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 annual test shall be executed according to the inspection *sheet on page 48.*

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 IEC 61496, Type 4
- is self- monitoring without additionally wiring.
- easy to adjust after tool changing.

Operative range for the laser-accident preventing light barrier of the AKAS® types are: **press brakes**

AKAS®-3M / -3F, AKAS®-IIM / -IIF: equipped with electromotor driven supports for transmitter and receiver for self-acting tool change if tools with diefferent heights are used

AKAS®-LC II M / -LC II F: is recommended if there are no freqent tool changes or in case if extended operation with the same tool is required, therefore no re-adjusting to different tool sizes is necessary. (Fig.7/4)

without Support:
AKAS®-LC II M,
AKAS®-LC II F

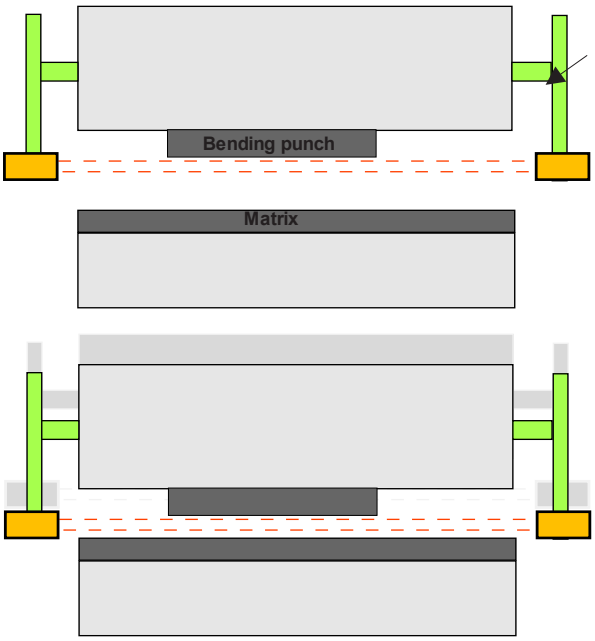


fig. 7/ 4

Serial Numbers:
AKAS®-LC II M
AKAS®-LC II F

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

	systems <u>without</u> operating mode selection operation only with additional safety PLC (e.g. **FPSC**)	**systems <u>with</u> operating mode selection** with integrated safety fuunctions
Functions / Characteristics	**AKAS®-LC II M**	**AKAS®-LC II F**
max. Overrun Traverse of the press brake	10 mm	10 mm
recommended turnover point from fast speed into slow speed (according to overrun traverse of the press) Distance between metal sheet and bending punch)	according to overrun traverse 13 - 22 mm	according to overrun traverse 13 - 22 mm
Detecting beams / Receiver elements	2 / 3	2 / 3
Inputs		
Overruntraverse control NLW	-	1 -selectable with / without
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	-	3 Pairs -selectable with / without
Stopp contactor control EDMO, EDMS	-	2 -selectable with / without
data of traverse in slow speed SGW	-	1 -selectable with / without
start / stop of closing stroke FUS, FUO	2 equivalent	2 -selectable antivalent or equivalent switching
position control in slow speed SGO, SGS	2	2 -selectable antivalent or equivalent switching - selectable with / without foot pedal delay
selection of box bending KAST	1	1
safety point SP	1	1
Outputs		
Safety outputs for release of closing stroke OSSD1, OSSD2	2	2
release and Emergency OFF of the rear stoppers RXOK1, RXOK2	-	2
box bending function is displayed HUSP	1	1
output for messages RS 232 TXD	1	1
demand for slow speed SGA	1	1

Principle of function bending of flat sheet metal

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

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

change-over point above sheet metal
from fast speed into slow speed:
according to overrun traverse 13 - 22 mm

Receiver elements:**E1, E2, and E3 activated (protection)**

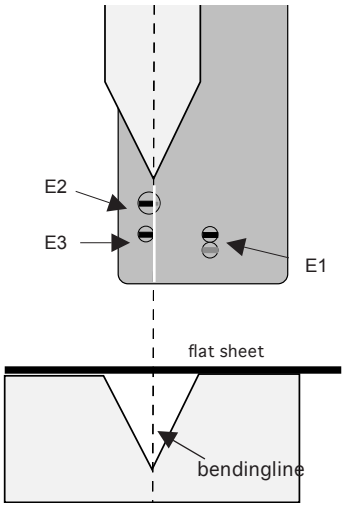


fig.9/ 2

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

E1 and E3 are deactivated,
E2 remains 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

The beams of the AKAS® must be located at a certain distance to the bending punch.
(See **chapter 5.2 Overrun Traverse Measurement and**
chapter 5.8 Adjustment of the distance between the AKAS® and the bending punch.
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.

By twice pressing the foot pedal can also use this function to perform a stroke, when the protective field of the AKAS ® is interrupted in the OT.

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 (= +24V).

change-over point above sheet metal from fast speed into slow speed:
according to overrun traverse 13 - 22 mm

receiver elements:
E1 not activated
E2 and E3 activated (protection)

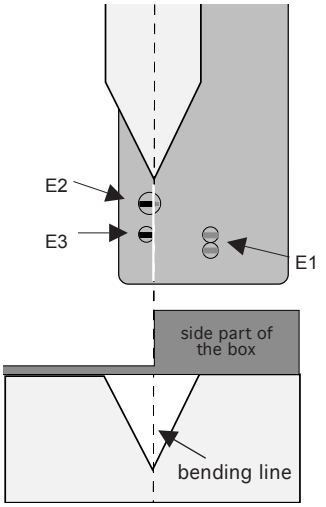


fig.10/ 2

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

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

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

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 functiuon is cancelled.

Bending of the box bottom

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.
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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!!

max. Standard-Range 6m (optional higher range)

housing type The aluminium housing of both transmitter and receiver are powder coated in RAL 1020 yellow. 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

dimensions

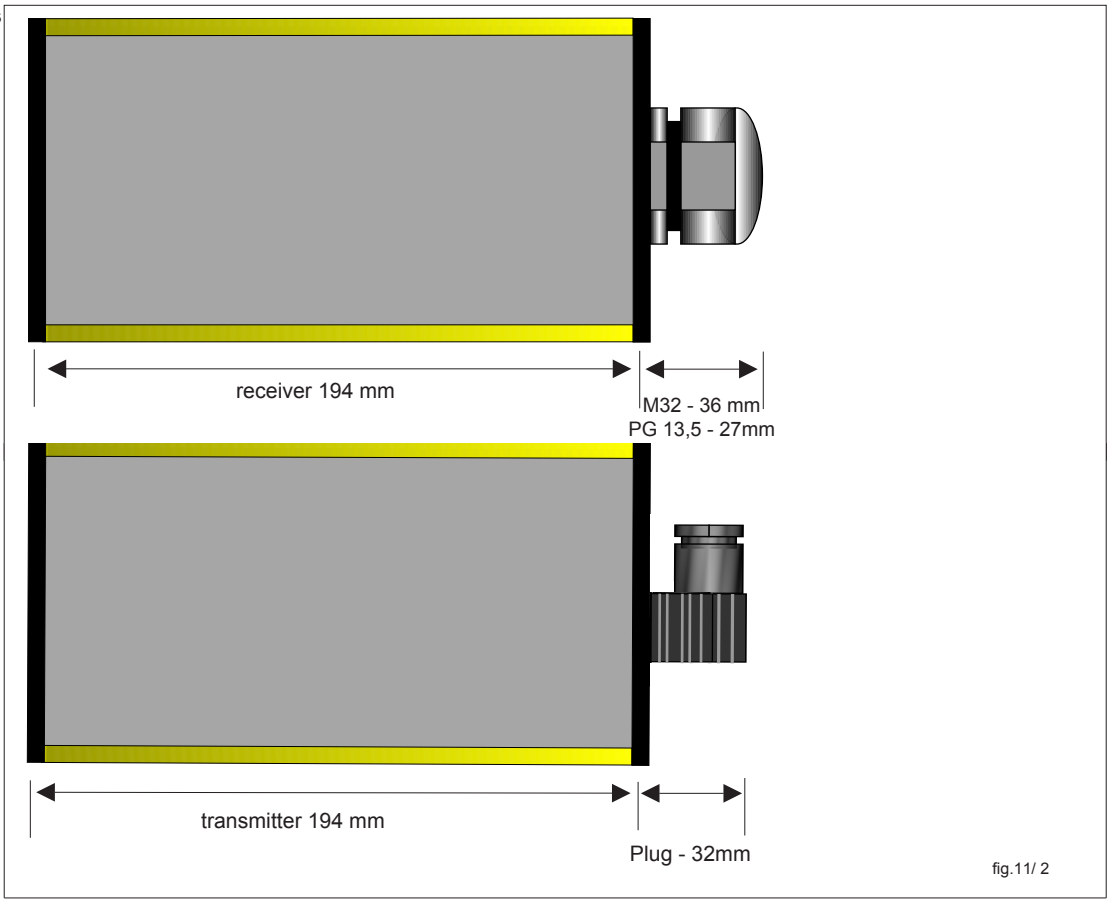


fig.11/ 2

mounting bracket

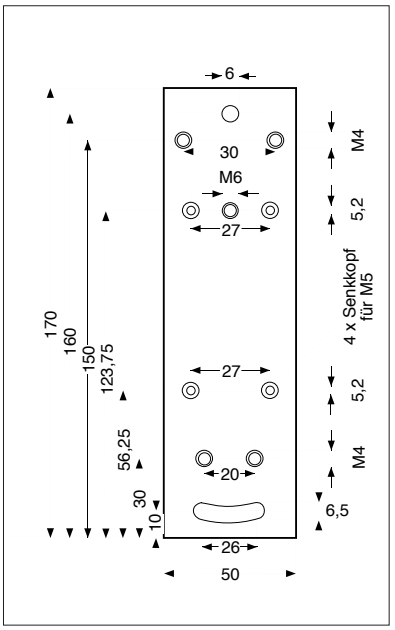


fig.11/ 1

front view

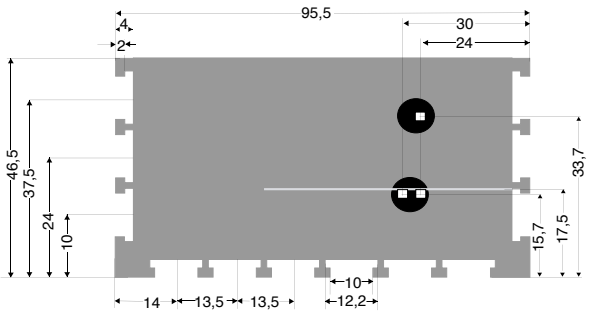


fig.11/ 3

How to proceed when mounting the AKAS® 5.1

Fiessler-mechanical holders

How to proceed: Step by step mounting the AKAS®

1	**Overrun traverse measurement**
2	**Design of the mechanical holders** - void if Fiessler holders are used
3	**Mounting of the holders at the ram**
4	**Mounting of the AKAS® at the ram**
5	**Connection of the AKAS® / Selection of the operating mode** at the ...F-series
6	**Adjustment of the AKAS® during first installation**
7	**Adjustment of the distance of the AKAS® from the bending punch**
8	**Function Verification of all electrical connections in view of the safety classs 4 requirements**
9	**Self-acting Overrun Traverse Test**

Holder for mounting of the AKAS®-LC
order code AKAS/AS/3/LC/ZM
(optional)

fig. 12/7

1. Overrun Traverse Measurement

The press must 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 (see page 5) 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 10 mm he fast speed must be reduced.

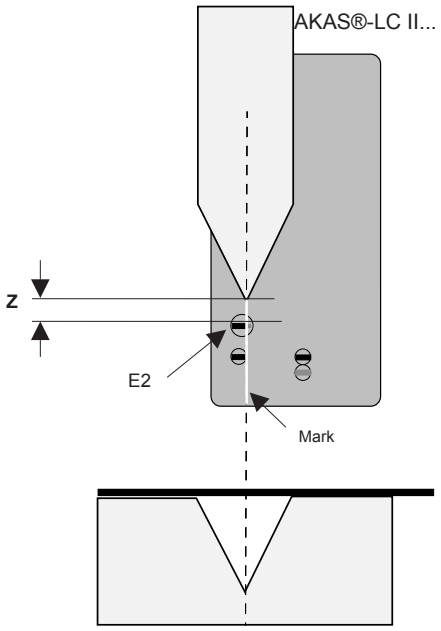


fig.13/1

distance Z after adjustment	max. allowable stop distance of the machine with interruption of a beam of the AKAS®-LCII in fast speed	recommended change over (U) from fast speed to work speed before the bending punch meets the sheet metal *
9 mm	10 mm	18 mm
8 mm	9 mm	17 mm
7 mm	8 mm	16 mm
6 mm	7 mm	15 mm
5 mm	6 mm	14 mm
4 mm	5 mm	13 mm

*** For tolerating undulating sheet metal of 2mm tolerance.**

Fig.13/2

2. design of the holders - void if Fiessler holding Devices are used

- The dimensions of the self-supplied holders must be individually laid out according to the dimensions of the press brake.
- The self-supplied holders must be made of torsion-free rigid material, e.g. steel tubes 80 x 50 x 5mm.
- They must be sufficiently long so that the largest and the shortest tool are still within the detection range of the AKAS® .
- 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 ram

a) The holders must be mounted at the ram in a way that the marks on transmitter and receiver correspond exaclty to the bending line. The receiver element E1 must face the operator and E3 must remain free when the highest tool is utilized. (Fig. 14/ 3 u. /4)
b) The gap between the front edge of the AKAS®systems and the press brake should be > 100mm in order to prevent injuriers while closing the press.
c) The existing mechanical guards of the machine must be modified in a way that any by-passing of the safety equipment by the operator is not possible. Likewise, any danger of geeting caught between grids and safety equipment must be excluded.

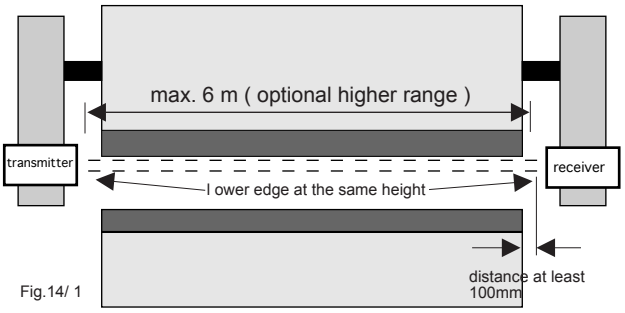


Fig.14/ 1

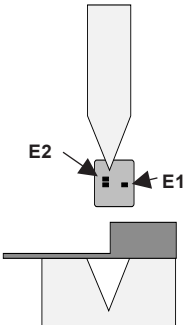


Fig.14/ 2

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.
Make sure that no material or solid parts are placed in the clearance beneath the AKAS® and the holders, in order to exclude any collision caused by the closing movement of the press brake. Fig. 14/ 4.

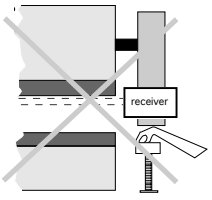


Fig.14/ 4

4. Mounting of the AKAS®-LC ... to the holders
Fiessler-holders

The **AKAS®LC-Holders** came with a complete set of fastening material and a detailed mounting instruction.

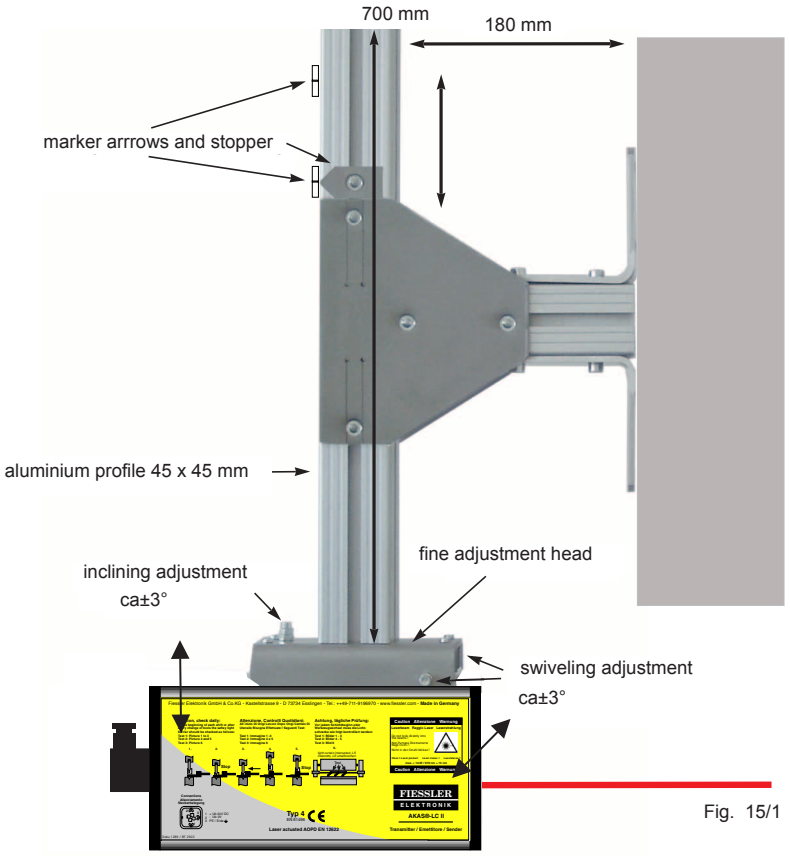


Fig. 15/1

Mounting on self-supplied holders

fastening bracket with tenon blocks at the rear

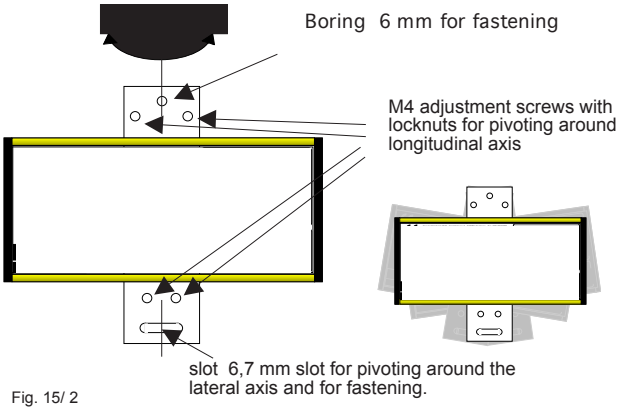


Fig. 15/ 2

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

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 chapters **6.3, 6.4, 6.5**.
The position of the Hex switches is described in chapter **6.5.2.**

6. Adjustment of the AKAS® at the first installation

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 ram.

The fastening brackets are designed for the fastening and adjustment of the AKAS®-LC II.

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

Transmitter and receiver must be mounted in a way that the receiver element E 4 remains free when the bending punch is fixed .

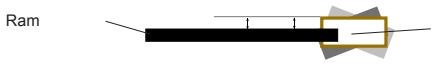


Fig. 16/1

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

adjustment of the receiver

If a height-adjustable support is used, adjust the support with the help of a spirit level vertically, i.e. parallel to the guiding rails of the ram.

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. When using a manually movable support for transmitter and receiver, make this test along the entire displacement area.

Check the distance between the mark and the perpendicular (bending line) to make sure that the receiver is carried up parallelly to the bending line.

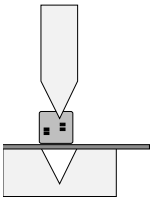


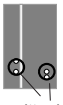
Fig.16/ 2

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.

If a support is used, adjust the support with the help of a spirit level vertically, i.e. parallel to the guiding rails of the ram.

The red transmitting beams should meet the receiver like it is shown inthe opposite illustration.



AKAS®-II Fig.16/4

fine adjustment

The holder of the transmitter must be turned around both the longitudinal and vertical axis until the laser beams are aligned parallel to the ram.

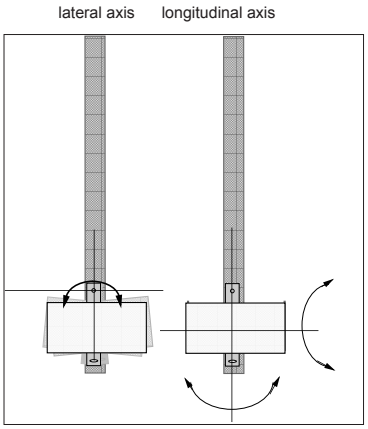


Fig. 17/2

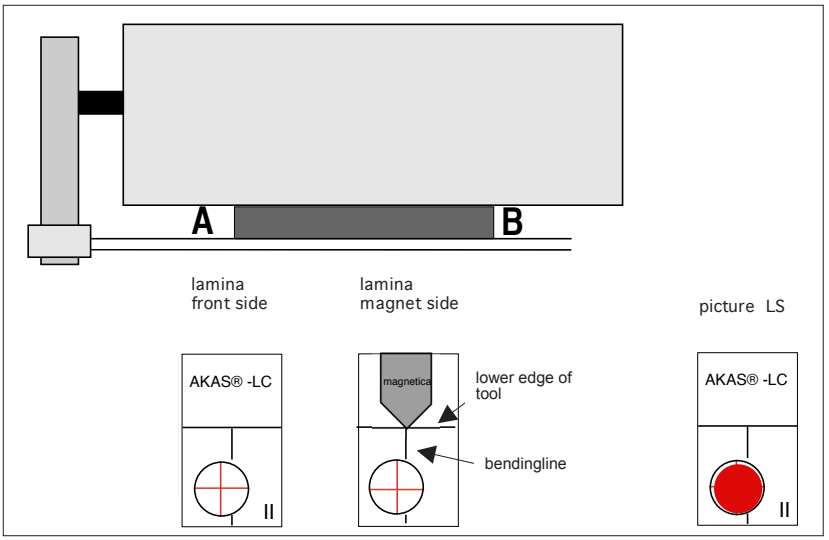


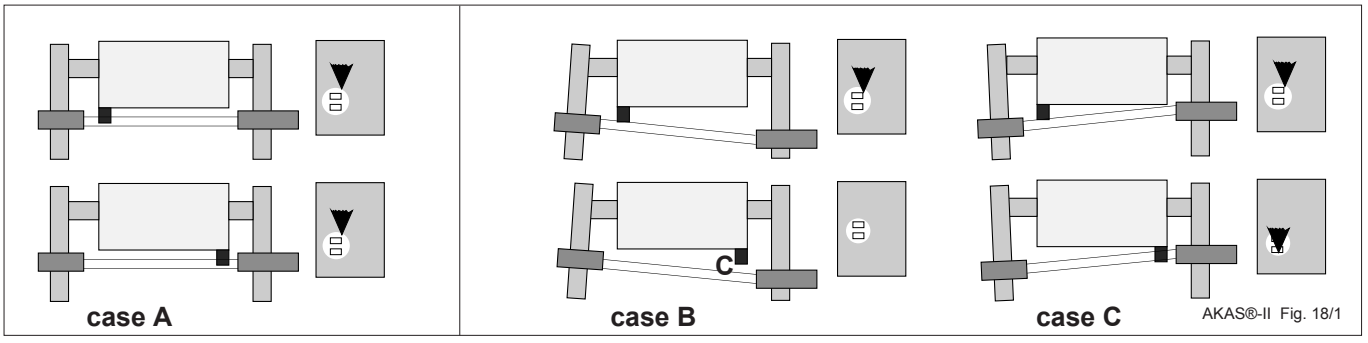
Fig. 17/6

When using large tools, the AKAS®-LC transmitter is adjusted as follows:

1. Place the special AKAS®-LC magnetic lamina with its magnetic side at the spot marked "A".
2. Adjust the transmitter in a way that the picture "LS" can be seen at the front side of the lamina..
3. Then place the special AKAS®-LC magnetic lamina with its magnetic side at the spot marked "B".
4. Adjust the transmitter in a way that the picture "LS" can be seen at the magentic side of the lamina.
5. Repeat the steps 1-4 until at both positions A and B the picture LS can be seen.

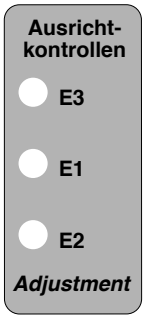
possible maladjustment AKAS® LC II M / -F	remedy AKAS®-LC II M / -F
The beam misses the target circle of the magentic lamina at both of the tool tips and meets at the right hand side of the circle.	By unscrewing all M4adjustment screws (Fig. 15/2) the support must be positioned further away behind the bending line. i.e. push the Fiessler holders in their slots further to the front.
The beam misses the target circle of the magentic lamina at both of the tool tips and meets at the left hand side of the circle.	By tightening all M4adjustment screws (Fig. 15/2) the support must be put closer to the bending line, i.e. push the Fiessler holders in their slots further to the front. .
The beam hits the target circle at the left tool end, at the right tool end the beam edge is lower than the target circle = **case B** Fig. 18/1	The transmitter must be turned to the right in the slot, i.e. on the Fiessler holders, the inclination adjustment screw mzust be tightened. .
The beam hits the target circle at the left tool end, at the right tool end the beam edge is further up than the target circle = **case C** Fig. 18/1	The transmitter must be turned to the left in the slot, i.e. on the Fiessler holders, the inclination adjustment screw must be looseend.
The beam hits the target circle at the left tool end, and at the right tool end the beam it hits a spot at the left outside of the target circle	After unscrewing the upper left M4 adjustment screws and after readjusting the right M4 adjustment screws the transmitter (Fig. 15/2) must be turned clockwise around its longitudinal axis, i.e. at the Fiessler holders, the swiveling is carried out counterclockwise by loosening of the front swiveling adjustment screw and by tightening of the rear swiveling adjustment screw
The beam hits the target circle at the left tool tip, and at the right tool end the beam it hits a spot at the right, outside of the target circle	After unscrewing the upper left M4 adjustment screws and after readjusting the right M4 adjustment screws the transmitter (Fig. 15/2) must be turned counterclockwise, i.e. at the Fiessler holders, the swiveling is carried out counterclockwise by loosening of the rear swiveling adjustment screw and by tightening of the front swiveling adjustment screw.

correct transmitter adjustment **in correct transmitter adjustment**



AKAS®-II Fig. 18/1

adjustment control - LEDs



synchronization transmitter - receiver	**AKAS®-LC II M / - F**
transmitter-beam does focus at all	E3, E2, E1 on
beam does not focus precisely	E...partially off
beam does not focus at all	E...off

Advise!
E3, E1, E2
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 press brake is not opened completely.

When using frequently upper tools with different hights, the system AKAS®-II or AKAS®-3 is recommended owing to the enhanced operating convenience during the tool change.

Adjusting instruction when using a movable support for transmitter and receiver

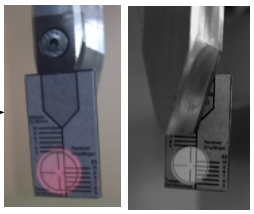
How to adjust the AKAS LC II according to the overrun traverse of the press brake.

1. Evaluate the overrun traverse of the press brake.

2. Transmitter adjustment

- Place the lower edge of the tool exactly on the line of the scale ("BT1870, Dok 1262/2") which corresponds to the evaluated overrun traverse →

- Adjust the laser beam in a way that it hits the center of the circles on the magnetic laming (parallel laser beam positioning) at the transmitter and the receiver sides of the tool. →



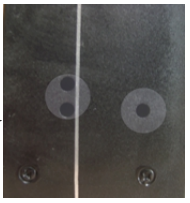
3. Receiver adjustment

- Place the lower edge of the tool exactly on the line of the scale which corresponds to the evaluated overrun traverse.

- Move the receiver upwards until LED E2 lights up. Then, move the receiver downwards until the LED E2 is to go out and “Free“ is displayed at the receiver. →

4. Enter the switch-over point (and the waviness of the sheet) at

5. The illustration on the receiver must look like this →



After having completed the adjustment procedure, the tests (see page 5) must be carried out.

Schematic layout of the AKAS®-LC after a tool change and of the consecutive follow-up of transmitter and receiver

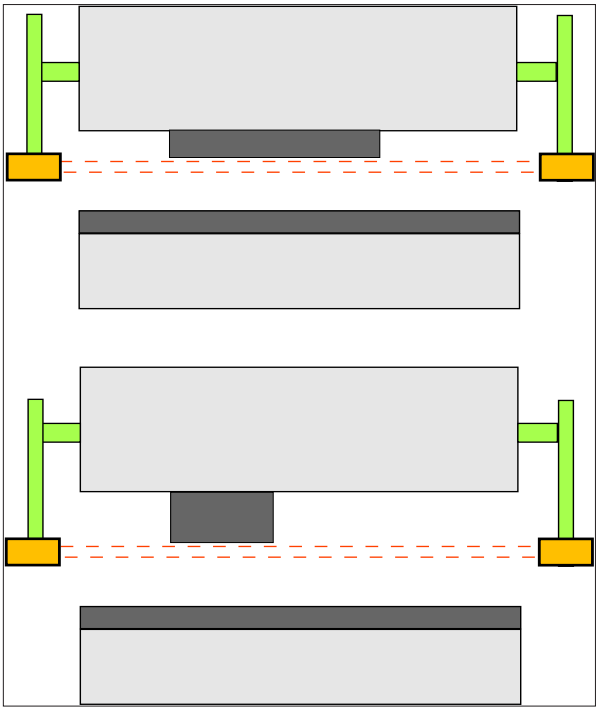


Fig.20/4

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

see chapter 6 **Electrical connections**

9. Automatic overrun traverse test

According to prEN 12622, the overrun traverse of the machine must 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 products of the **AKAS®-...F** product family can execute this overrun traverse test with the help of a cam scitch and a normally closed contact. For this, the length of the cam must correspond to the allowable overrun traverse plus the hysteresis of the cam switch. The maximum allowable overrun traverse must not exceed the value of 10 mm with the **AKAS®-LCF .**

This overrun traverse cam must be mounted in a way that the press is in the maximum closing speed when the cam switch is opened by the cam, and the stroke is started out of the upper dead center of the machine.

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.

If the overrrun traverse is too long, the cam does not open the overrun traverse cam switch when the closing movement is stopped, and the AKAS erwawill prevent the complete bending stroke in fast speed.

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 Category	4 (EN ISO 13849-1:2008) and EN 61496 or IEC 61496 and EN 12622
Performance Level	PL e (EN ISO 13849-1:2008), $MTTF_D$ > 300
Safety Integrity Level	SIL3 (EN 62061:2005), PFH = 2,38 x 10^{-10}1/h
operation voltage	24 V DC, +/- 20 %, SELV
max. power cunsumption	(no charge)**:** max. 0,5 A
protection from incorrect connection	Protection against all possibilities of errors is not provided.
protection class	III
electrical connection	transmitter: angular plug receiver: integrated plug-in connector with M 32 as strain relief
connecting cables	transmitter: 3- core max. 1 mm receiver: 10- bis 28-core (according to operating mode) 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. Output current for resistance u. Inductive loads in the on state = min. 0mA, max. 0.5 A, max. Output current in the inactive = 50 uA max. Voltage in the inactive = 0.9V, max. capacitive load = 200 nF, max. Cable resistance between OSSD and load = 10 Ohm **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 over-run 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-current 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)
Displaying of the muting signal out of the machine control must be laid out in a way that no muting signal is given if there is any misfunction 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.

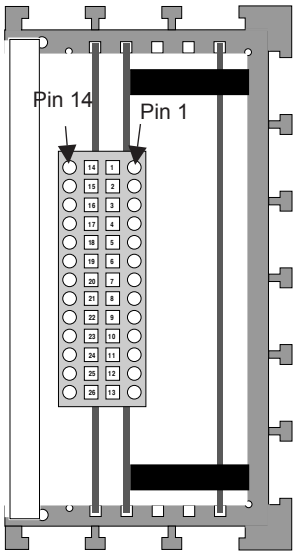
Checkliste

		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 . **(The above-mentioned foot switch, must be a 3 position safety foot switch.)**	
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 13 - 22 mm above the slug. (according to overrun traverse of the press) (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 sheet.	
10	After a voltage reset, an overrun traverse test is carried out.	
11	The overrun traverse is smaller than 10 mm.	

function

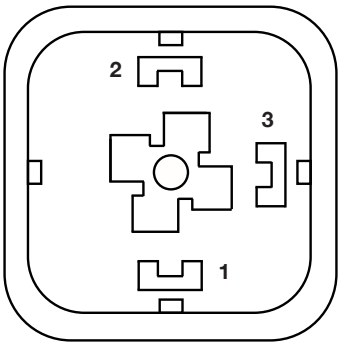
- protection of the operator from being squeezed between the ram and the matrix (all other safety monitoring functions are carried out by a safety control (e.g. safety PLC **FPSC**).
- The **safety PLC** gives a safe signal to the **AKAS®** inputs **FUS** and **FUO** , if a closing movement is ab out 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®-LC II M .**

terminal
receiver



Anschlussklemmen Empfänger			
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

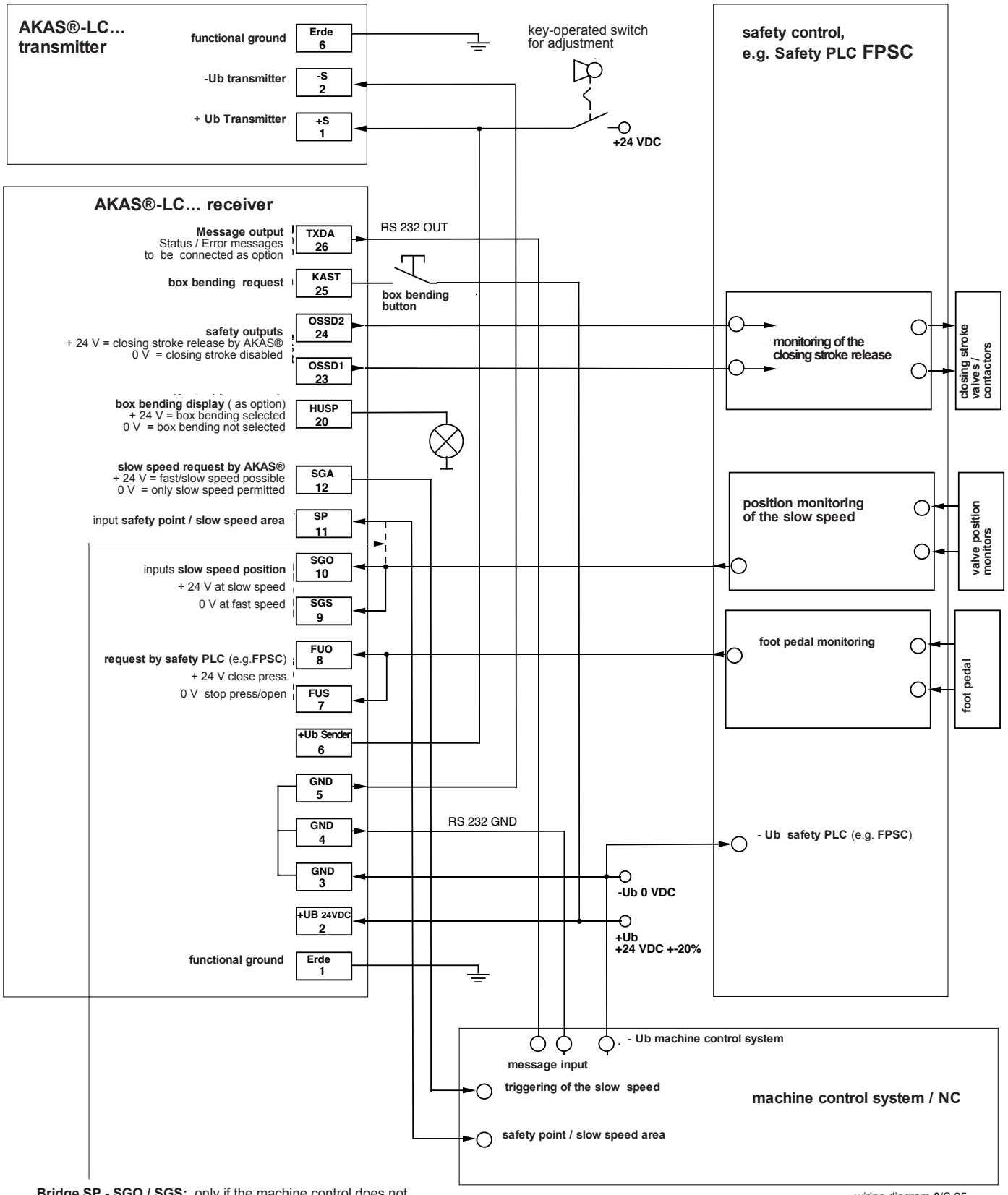


Terminals of the transmitter		
Nr	**designation**	**meaning**
1	+S	+Ub transmitter
2	-S	-Ub transmitter
3	Erde	functional ground

AKAS®-LC II M

AKAS®-LC II F --with HEX switch position 00 00

--operation only with additional safety PLC (e.g. **FPSC**)



Bridge SP - SGO / SGS: only if the machine control does not indicate any safety point or slow speed range.
Short strikes within the slow speed range by activating the footpedal twice are only possible, if the valves are not yet in the slow speed position at the start of the stroke, but if the AKAS® light beams have been interrupted before.

wiring diagram **0**/S.25

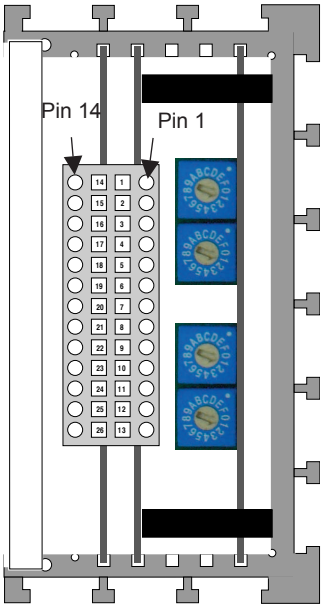
functions **AKAS®-LC II F** provide - apart from the standard functions - more safety functions which enable the moritoring and control of a press brake without additional safety PLC.

These safety functions are selectable via 4 HEX switches.

- **Protection of the operator from** being squeezed between the ram and the matrix
- **Overrun traverse test** (after every voltage reset, and to be repeated at least within the next 30 h)
- **Stop contactor control** (EDM)
- **Monitoring of the slow speed position** (position monitoring of the contactors)
- **Release of the closing stroke** (via safety outputs)
- **monitoring of the mechanical protective grids** (at the rear and at the sides of the press)
- **emergency-OFF-Monitoring** (Emergency OFF at the rear and at the front)
- **Emergency OFF of the rear stoppers**
  (Emergency OFF at the rear and at the front, metal protective grids)

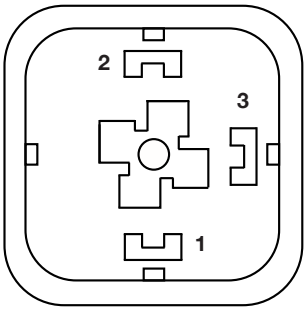
Terminals AKAS®-LCF

Receiver



Terminals of the Receiver AKAS®-LCF			position of HEX-switches B8 B8 oder F8 F8	position of HEX-switches 00 00
Nr	**designation**	**meaning**	**signal level**	**signal level**
1	Erde	functional ground		
2	+Ub 24VDC	power supply		
3	-Ub 0V	power supply		
4	RS 232 GND	message output (State-/error)		
5	-Ub Sender	connection for -Ub AKAS transmitter		
6	+Ub Sender	connection for +Ub AKAS-transmitte /key-operated switchfor adjustment	+24V if foot pedal is activated or key-operated switch is on	+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	0V Press brake stop +24V Press brake close
8	FUO	input **Start / Stop closing stroke**	+24V Press brake stop 0V Press brake close	0V Press brake stop +24V Press brake close
9	SGS	input **monitoring of slow speed position**	0V: at fast speed +24V: at slow speed	0V: at fast speed +24V: at slow speed
10	SGO	input **monitoring of slow speed position**	+24V: at fast speed 0V: at slow speed	0V: at fast speed +24V: ar slow speed
11	SP	input **safety point**	0V within fast speed range +24V within slow speed range	0V: at fast speed +24V: at slow speed
12	SGA	output **slow speed request**	0V only slow speed permitted +24V fast/slow speed possible	0V only slow speed permitted +24V fast/slow speed possible
13	NLW	input **overrun traverse control input**	0V: if activated by cam switch +24V if not activated by cam switch	
14	EDMS	input **monitoring of the Stopvalves**	0V at stop +24V at closing stroke in fast	
15	EDMO	input **monitoring of the Stopvalves**	0V: at closing stroke +24V: at Stop	
16	NA1	input **Emergency OFF / rear metal grid**	+24V if grid is closed i.e. emerg. OFF is not activated	
17	NA2	input **rear / lateral metal grid**	+24V if grids are closed	
18	NA3	Eingang **Emergency OFF / lateral metal grid**	+24V if grid is closed i.e. emerg. OFF is not activated	
19	S_EU2K	+Ub transmitter EU2K 500/2 rear guard with antivalent switching light grid		
20	HUSP	output **request for higher switch-over point**	+24V: if box-bending is selected	+24V: if box-bending is selected
21	RXOK1	output **drive rear stopper emergeny-OFF**	+24V: if enabled	
22	RXOK2	output **drive rear stopper emergeny-OFF**	+24V: if enabled	
23	OSSD1	safety output **release of the closing stroke**	+24V: if enabled	+24V: if enabled
24	OSSD2	safety output **release of the closing stroke**	+24V: if enabled	+24V: if enabled
25	KAST	input **box bending**	+24V pulse min. 100 ms	+24V pulse min. 100 ms
26	RS 232 out	messaage output (State-/error)		

transmitter

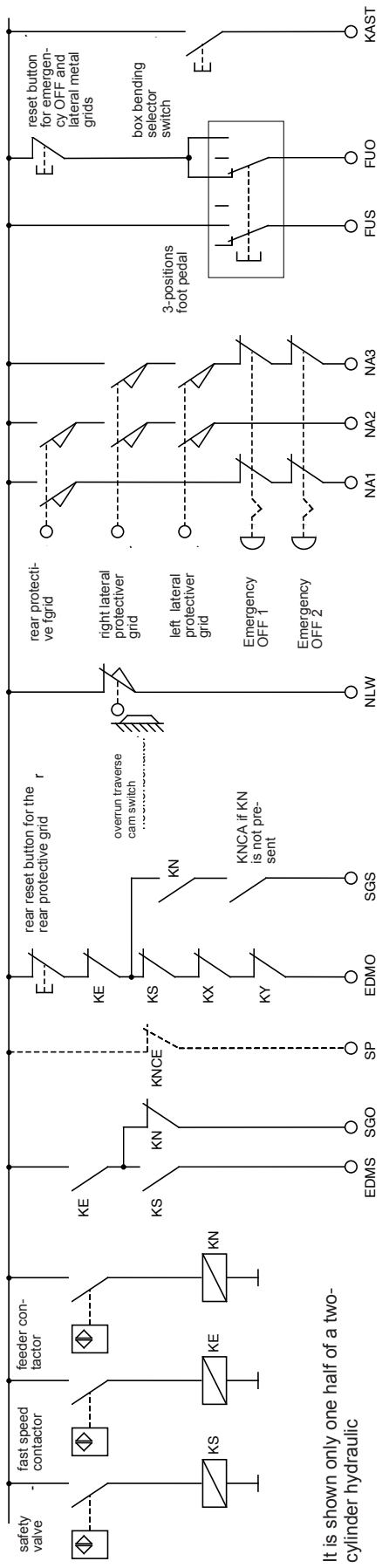


Terminals of the transmitter		
Nr	**designation**	**meaning**
1	+S	+Ub transmitter
2	-S	-Ub transmitter
3	Erde	functional ground

Machine-Safety monitoring by AKAS®-...F

Wiring example with a suitable hydraulics. AKAS is responsible for all safety related monitoring tasks (at a Hex switch B8 B8 or F8 F8)

AKAS monitors both positions of the fast speed and slow speed state and requires:
in **fast speed:** at **SGO = + 24 V** and at **SGS = 0 V**
in **slow speed:** at **SGO = 0 V** and at **SGS = + 24 V**
During the switching over from one state into the other state, an enhancable switch-over time is tolerated.
see **selectable switch-over delay enhancement of the valve position monitor**



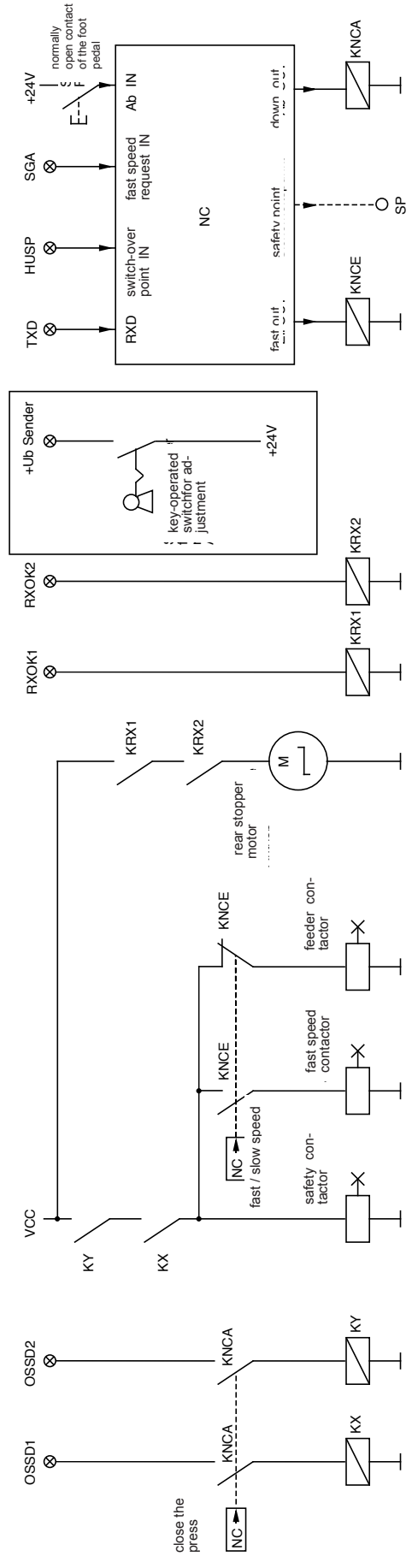
Press brake	safety con-tactor / KS	fast speed valve / KE	feeder con-tactor / KN
Stop	0	0	0
fast / down	1	1	0
slow/ down	1	0	1
up	0	0	0

It is shown only one half of a two-cylinder hydraulic

○ AKAS inputs

⊗ AKAS outputs

----- can be carried out by the NC or by a contact of the slow speed/fast speed swiching over



wiring diagram **2**/S.28

1. operation with additional Safety PLC
(e.g. Safety PLC **FPSC**)

The safety PLC is responsible for the fast speed / slow speed position control and provides this state to the AKAS€ inputs SGO, SGS and SP vis a signal line. (see **wiring diagram 1/S. 29**)
in **fast speed:** at **SGO, SGS and SP = 0 V**
in **slow speed**: at **SGO, SGS** and **SP = + 24 V**
During this, the safety PLC must monitor the signal line to the AKAS® **for eventual short-circuits** against potential conductiong lines.

2. monitoring of the foot pedal

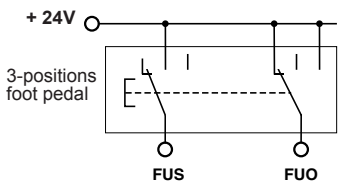
In the operating modes "without additional Safety PLC" the **monitoring of the foot pedal** is permanently present. AKAS ® activates the safety outputs OSSDs only if the foot pedal is permanently pressed. AKAS® monitors both positions of the foot pedal and requires:

if **the foot pedal is released:** at **FUO = +24 V** and at **FUS = 0 V** (see **wiring diagram 4a/S. 29**)
if **the foot pedal is pressed:** at **FUO = 0 V** and at **FUS = + 24 V**
The monitoring function is able to monitor even 2 connected foot pedals, if two operators work at the press brake and if the foot pedals are correctly wired as shown in **wiring diagram 4b/S. 36.**

In the operating modes "with additional Safety PLC" the **monitoring of the foot pedal** can be cancelled, by selecting: " equivalent switching inputs for enabling the closing stroke".

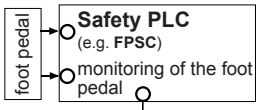
In this case, both AKAS® inputs **FUS and FUO** are triggered **+ 24 V** , if a closing movement of the press brake is wanted.

wiring of foot pedal for one-man operation operation with monitoring of the foot pedal



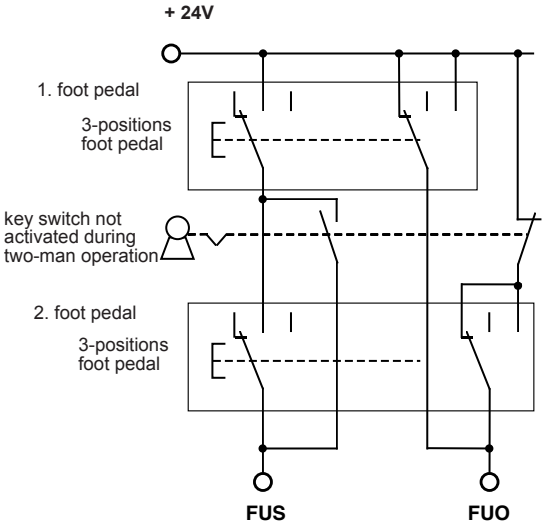
wiring diagram **4a**/S.29

wiring of foot pedal for one-man operation operation without monitoring of the foot pedal



wiring diagram **4c**/S.29

wiring of foot pedals with key switch for one - or two-man operation operation with monitoring of the foot pedal



wiring diagram **4b**/S.29

3. easy-breaking when the foot-pedal is released
(foot pedal response delay)

During the operating modes without additional safety PLC , a **foot pedal response delay** of the **AKAS® safety outputs** (OSSDs) **of about 30 ms** after the release of the foot pedal during the fast speed closing stroke can be selected.

When the foot pedal is checked also by the machine control, the control will execute an easier, smoother breaking via the proportional valves of the closing movement during this time, just before the OSSDs of the AKAS® disable the other closing stroke valves.

4. Overrun traverse control

The overrun traverse control is realized by a cam switch with a normally closed contact. For this, the length of the cam must correspond to the allowable overrun traverse plus the hysteresis of the cam switch. The maximum allowable overrun traverse must not exceed the value of 10 mm. This overrun traverse cam must be mounted in a way that the press is in the maximum closing speed when the cam switch is opened by the cam, and the stroke is started out of the upper dead center of the machine.

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.

If the overrrun traverse is too long, the cam does not open the overrun traverse cam switch when the closing movement is stopped, and the AKAS will prevent the complete bending strokes in fast speed.

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.

5. Control of the stop contactors (EDM)

AKAS® monitors in a safe way both positions of the stop- and the fast speed closing state of the contactor position monitors and switching contactors and requires:

in **fast speed state** at **EDMS = + 24 V** and at **EDMO = 0 V**
in **Stop state** at **EDMS = 0 V** and at **EDMO = + 24 V** (see **wiring diagram 2/S.39**)
During the **closing movement in slow speed, EDMO has to be = 0 V, EDMS is not monitored.**
After the relase of the safety switching outputs (OSSDs) the AKAS® requires a switch-over of the EDM signals no later than 300 ms + the programmed tolerance enhancement.
In the operating modes with additional safety PLC the safety PLC (e.g **FPSC**) must carry out the monitoring of the stop contactors.

6. Monitoring of the door- andthe Emergency OFF-circuits, Emergency-OFF of the Motor-driven Stops

The protective doors and the emergency OFF-buttons are evaluated by double-channel inputs. As soon as at least one inout is disab led, i.e. is in OFF state, the closing movement will be stopped immediately by switching OFF of the OSSDs, and the movement of the rear stoppers is prevented by the disabling of the double channeled release **RXOK1 and RXOK2.**
A continuation of the press operation in only possible if all relevant protective switching circuits are disabled and and then closed again, and if afterwards the respective rest button is activated.

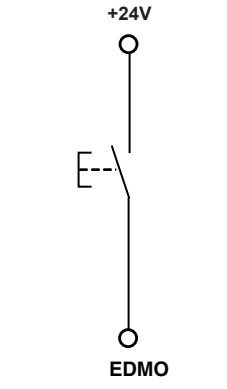
If the protective side doors are opened, AKAS® permits the movement of the rear stoppers after having activated the respective reset button. The closing movement of the press is permitted only during slow speed state. For this, AKAS® requires the prevention of the fast speed by the NC, by disabling the output SGA . AKAS® monitors the slow speed state during the closing movement. During this, the protective field of the AKAS® is **not** active.

During operation with foot pedal monitoring (antivalent foot pedal contacts) , the reset is carried out after the disabling and re-enabling of the Emergency-OFF-Circuits and of the lateral protective metal grids. This is carried out by activation of an normally closed contact butto., which is connected in series to the normally closed foot pedal contact at FUO (see **wiring diagram 2/S.39 u. 5b/S.30**) .

The Reset after the disabling and re-enabling of the rear protective grid is carried out during the operation with EDM by activation of a normally closed contact button, which is connected in series to the normally closed contactor controls at EDMO. (see **wiring diagram 5a/S.30**).

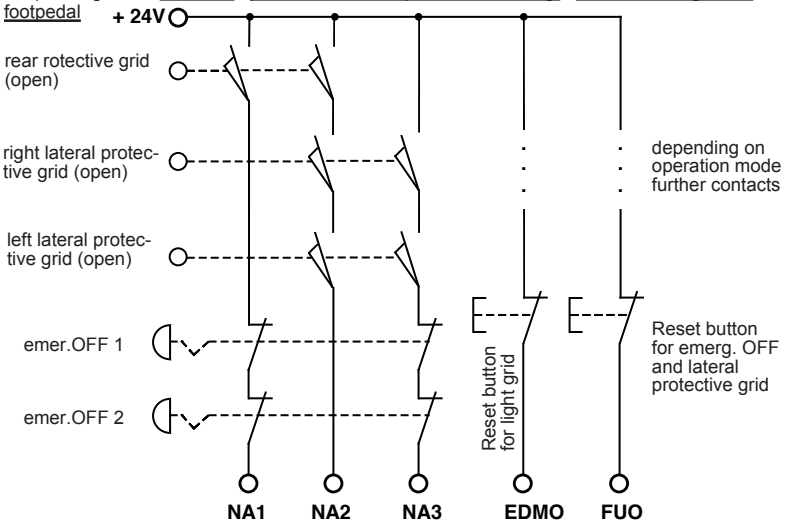
a. Reset button for rear safeguard at operating mode without EDM

b. Reset button for all Protective doors and emergency OFFs at operating mode without monitoring of the footpedal



wiring diagram **5a**/S.30

Protective doors and emergency OFFs
at operating mode withEDM / protective doors equivalent switching / with monitoring of the footpedal



wiring diagram **5b**/S.30

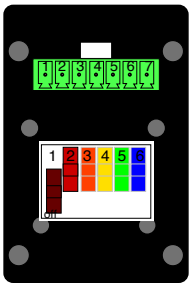
During the operation without foot pedal monitoring (equivalent triggering of FUO and FUS) the reset of all protective circuits is carried out by a normally open contact which is connected between + 24 V and EDMO. (see **wiring diagram 5a/S.30**)

The ermegency-OFF-circuits are equivalent switching, i.e. the eemergenca-OFF-buttons must have 2 normally closed contacts. When laying out the circuits of the protective doors, you may choose from either the equivalent switching protective door contacts, i.e. 2 normally open contacts per door switch, or antivalent switching contacts, i.e. only one normally open and normally closed contact per door switch. The secons possibility, however, is only available with the operation modes without additional safety PLC. The connection of the emergeny OFF- circuits and the equivalent protective door contacts to the reset buttons when EDM is selected, is shown on **wiring diagram 2/S.39.**

6a. Rear safeguarding with lightgrid

with **equivalent** switching outputs

	Receiver			
	ULVT	TLVT	ULCT	TLCT
+24V	7	7	1, 2, 4	1, 2, 4
0V	6	6	7	7
OSSD1	3	1	5	5
OSSD2	4	2	6	6

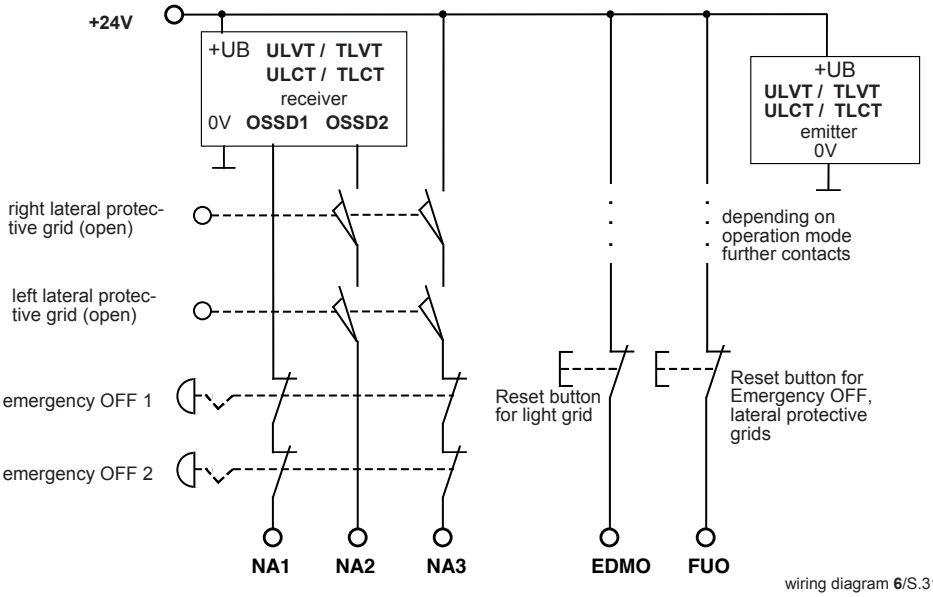


ULVT / TLVT:
Dip-switches (see picture)
-without restart interlock
-without EDM
-OSSD equivalent

ULCT / TLCT:
programming the operation mode of the lightgrid:
-without restart interlock
-without EDM

Instead of using a rear protective metal grid, a safety light grid with equivalent switching outputs, e.g. type Fiessler ULVT / TLVT or ULCT / TLCT as shown in **wiring diagram 6/S.31** is possible.

Protective doors and emergency OFFs and light grid ULVT / TLVT or ULCT / TLCT for rear safeguarding
at operating mode equivalent protective door control pairs / with EDM / with monitoring of the foot pedal / with Start interlock for the lightgrid



wiring diagram **6**/S.31

Only to use the operation modes D...D... or F...F...!
These modes activates Start interlock for the rear safety lightgrid! (see chapter 6.5.2)

If the connected lightguard does not detect all possible cross circuit and short circuit on the outputs OSSD 1 and OSSD2 you have to wire them in a way that no cross and short circuit is possible.

6b. Rear safeguarding with lightgrid

with **antivalent** switching outputs

As alternative, the connection of a light grid with antivalent switching outputs is also possible, like p.e. the Fiessler light grid EU2K 500/2. **Wiring Diagram 7/S.31** shows the connection of the Fiessler light grid EU2K 500/2 as a rear safeguard. In this case, the switches of the lateral protective grids must have antivalent switching contacts (1 normally closed and 1 normally open contact each) and the operating mode with antivalent switching protective door circuits must be selected. In this case, the connector 1 at the transmitter of the **EU2K 500/2** must be wired to the output S_EU2K of the AKAS®.

The lateral protective grids are not monitored. Every switching-over of the selector, the reset buttomn must be activated for the Emergency-OFF circuits and the circuits of the lateralprotective doors.

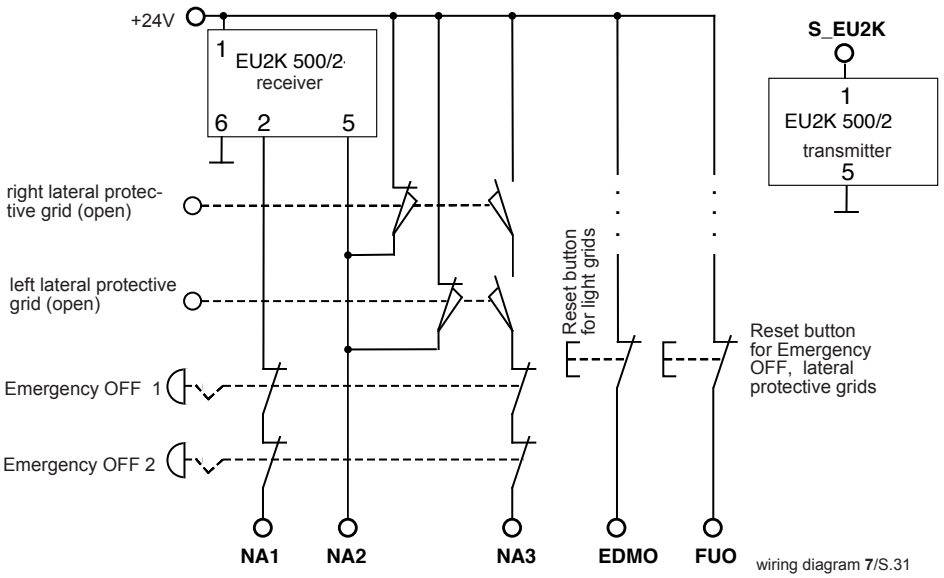
Protective doors and emergency OFFs and light grid EU2K 500/2 for rear safeguarding
at operating mode antivalent protective door control pairs with EDM / with monitoring of the foot pedal

plug EU2K emitter 24 V

Pin 1 : + 24 V DC
Pin 5 : - Ub

plug EU2K receiver

Pin 1 : + 24 V DC
Pin 2 : A1
Pin 5 : A2
Pin 6 : - Ub



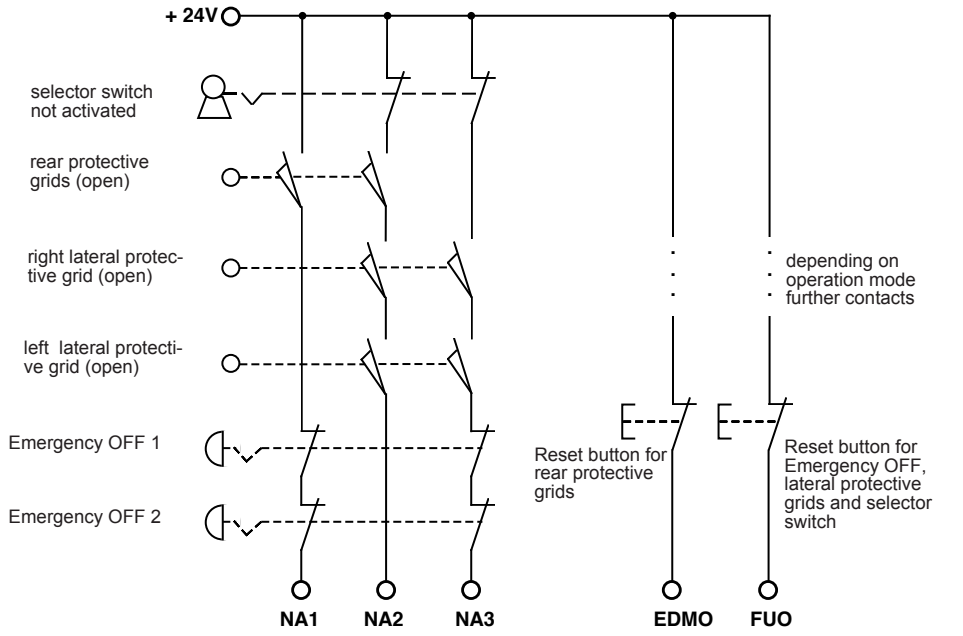
wiring diagram **7**/S.31

7. Installation operating mode, i.e. protection by monitores slow speed without avtivated protective field during operation with door monitoring

A selector switch provides the possibility to choose between operating mode with activated protective field of the AKAS® and fast closing speed or operating mode with protection only by monitored slow speed closing, see **Wiring diagrams 8/S.32 und 9/S.32**. If the selector switch is activated, the protective field of the AKAS® is muted (bridged). This state is displayed by the shining muting lamp. By disabling of its **output SGA** , AKAS® requires the NC to carry out only cycles in slow speed, which is monitored by the AKAS®. Given the fact that in this operating mode, only cycles in slow speed are possible, the lateral protective grids are not monitored. Every switching-over of the selector, the reset buttomn must be activated for the Emergency-OFF circuits and the circuits of the lateralprotective doors.

operation with equivalent switching protective door contacts

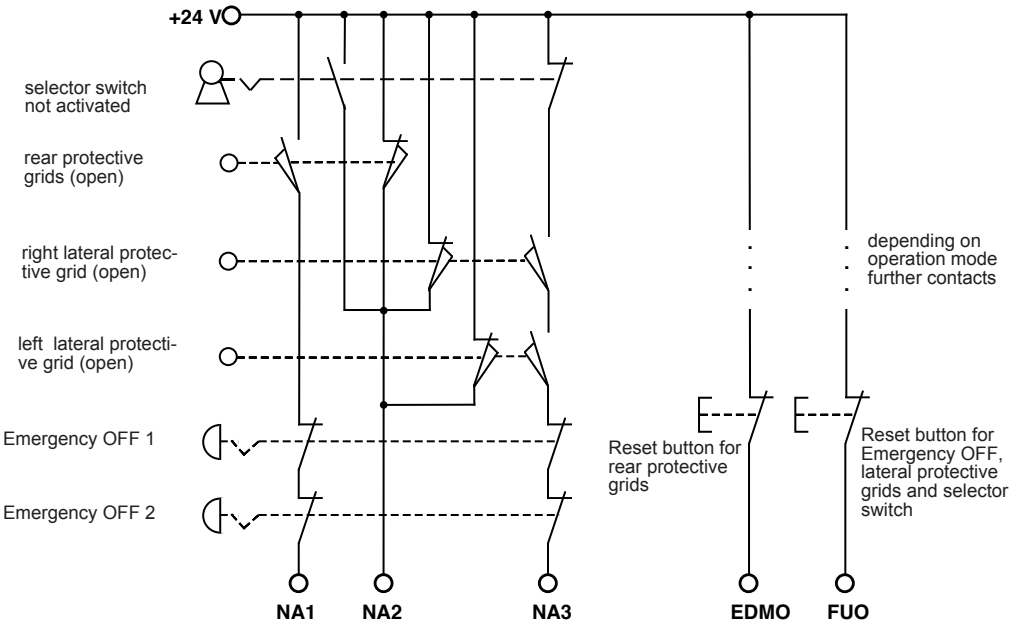
operation with **activated protective field of the AKAS® and slow speed closing movement** (selector not activated)
operation with **only protection by monitored slow speed closing movement** (selector switch activated)



Wiring diagram **8**/S.32

operation with antivalent switching protective door contacts

operation with **activated protective field of the AKAS® and slow speed closing movement** (selector not activated)
operation with **only protection by monitored slow speed closing movement** (selector switch activated)

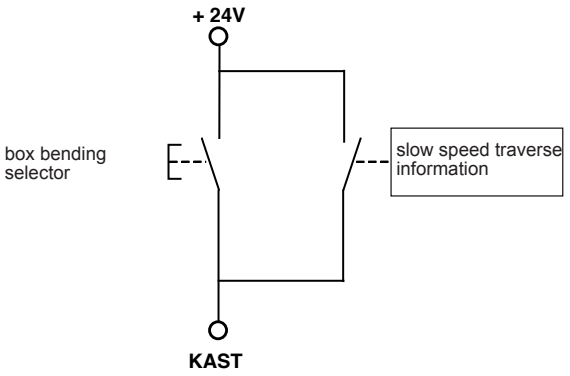


Wiring diagram **9**/S.32

8. slow speed traverse information

During the operation with slow speed traverse information, the upper receiver elements are only muted if a +24 V signal is given to KAST. This signal is provided by a traverse measuring system (e.g. Fiessler AMS, or NC) which indicates that the traverse has been actually covered. By this, the upper receiver elements remain activated as longh as possible even in the case of a very low slow speed, and intermediate stops during slow speed. By this, even in slow speed range, protection by the AKAS® is provided until the introduction of the operator`s fingers between bending punch and sheet metal is made impossible. Connection: see **wiring diagram 10/S.33.**

connection with slow speed traverse nformation



wiring diagram **10**/S.33

9. selectable switch-over time tolerance of the valve position monitors

AKAS® dynamically monitors the valve position signals, i.e. the individual states of the valve position signals must change within a certain time. The basic tolerances for the switching-over of the valve position monitors from stop state into closing movement and from fast speed movement into slow speed movement or vice-versa can be enhanced by additional 300 ms.

The basic tolerances have the following values:

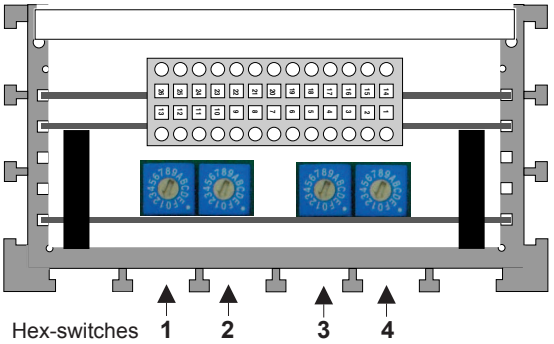
Switching-over from stopped condition into closing movement after the enabling of the OSSDs: 300 ms, (only with operating mode "Monitored EDM"

Switching-over into the slow speed condition when the start is within the range of the safety point (when SP = 1): 100 after from the detection of the closing movement consition by the EDM, i.e.. 100 ms after the enabling of the OSSDs during operating mode "without EDM".

Switching-over into the fast speed condition when the start is outside the safety point (when SP = 0): 100 ms after the detection of the closing movement condition by the EDM, i.e. 100 ms after enabling of the OSSDs during operating mode "without EDM".

Switching-over into the slow speed condition, start with request for slow speed (200 ms after SGA = 0 has been sent to NC): 70 ms after the detection of the closing movement conditin by the EDM, i.e. 70 ms after the enabling of the OSSDs during operating mode "without EDM.".

By the use of 4 Hex switches different operating modes can be selected.
The Hex-switches must always be programmed in pairs (1 and 3, 2 and 4).
Within each pair, equal values must be programmed.



1. Operating modes without additinal safety control

with / without monitoring of protective doors / monitoring of the emergency off circuits (inputs equivalent)

Hex-switches 1 and 3 Hex-switch-positions	start / stop of closing stroke: Monitoring of the foot pedal antivalent	start / stop of closing stroke: soft-breaking when the foot-pedal was released	Start interlock for the rear lightgrid	overrun traverse control	Monitoring of protective doors / Emergency OFF equivalent switching
8	with	with	without	without	without
9	with	without	without	without	with
A	with	with	without	with	without
B	with	without	without	with	with
C	with	without	without	without	without
D	with	without	with	without	with
E	with	without	without	with	without
F	with	without	with	with	with

Hex-switches 2 and 4 Hex-switch-positions	EDM stop valves monitoring	slow speed traverse information	* switching over tolerance enhancement of the valve position monitors
0	without	without	+ 0 ms
1	without	without	+100 ms
2	without	without	+ 200 ms
3	without	without	+ 300 ms
4	without	with	+ 0 ms
5	without	with	+100 ms
6	without	with	+ 200 ms
7	without	with	+ 300 ms
8	with	without	+ 0 ms
9	with	without	+100 ms
A	with	without	+ 200 ms
B	with	without	+ 300 ms
C	with	with	+ 0 ms
D	with	with	+100 ms
E	with	with	+ 200 ms
F	with	with	+ 300 ms

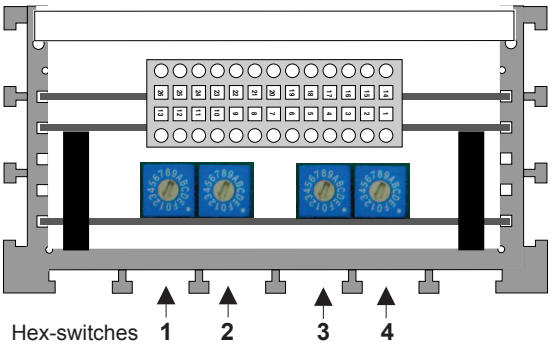
with monitoring of protective doors (inputs **antivalent**) / monitoring of the emergency off circuits (inputs equivalent)

Hex-switches 1 and 3 Hex-switch-positions	start / stop of closing stroke: Monitoring of the foot pedal antivalent	start / stop of closing stroke: soft-breaking when the foot-pedal was released	overrun traverse control	EDM stop valves monitoring	Monitoring of the protective doors antivalent switching Monitoring of the Ernergency OFF equivalent switching
0	with	with	without	without	with
1	with	with	without	with	with
2	with	with	with	without	with
3	with	with	with	with	with
4	with	without	without	without	with
5	with	without	without	with	with
6	with	without	with	without	with
7	with	without	with	with	with

Hex-switches 2 and 4 Hex-switch-positions	slow speed traverse information	* switching over tolerance enhancement of the valve position monitors
8	without	+ 0 ms
9	without	+100 ms
A	without	+ 200 ms
B	without	+ 300 ms
C	with	+ 0 ms
D	with	+100 ms
E	with	+ 200 ms
F	with	+ 300 ms

⚠ *** Attention!**
Select always the shortest possible switching over tolerance enhancement of the valve position monitors!

The Hex-switches must always be programmed in pairs (1 and 3, 2 and 4). Within each pair, equal values must be programmed.



2. Operating modes with additional Safety control (e.g.. Safety PLC **FPSC**)

Hex-switch 1 and 3 Hex-switchpositions	start / stop of closing stroke: Monitoring of the foot pedal antivalent	start / stop of closing stroke: inputs for release of closing stroke FUS / FUO	overrun traverse control	Monitoring of protective doors / Emergency OFF equivalent switching
0	without	equivalent	without	without
1	without	equivalent	without	with
2	without	equivalent	with	without
3	without	equivalent	with	with
4	with	antivalent	without	without
5	with	antivalent	without	with
6	with	antivalent	with	without
7	with	antivalent	with	with

Hex-switch 2 and 4 Hex-switchpositions	EDM Stop valve monitoring	slow speed traverse information	* switching over tolerance enhancement of the valve position monitors
0	without	without	+ 0 ms
1	without	without	+100 ms
2	without	without	+ 200 ms
3	without	without	+ 300 ms
4	without	with	+ 0 ms
5	without	with	+100 ms
6	without	with	+ 200 ms
7	without	with	+ 300 ms

⚠ *** Attention!**
Select always the shortest possible switching over tolerance enhancement of the valve position monitors!

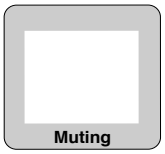
example:

Hex switch	1	2	3	4
Hex switch position	3	1	3	1

Hex-switch 1 and 3 Hex-switchpositions	start / stop of closing stroke: Monitoring of the foot pedal antivalent	start / stop of closing stroke: inputs for release of closing stroke FUS / FUO	overrun traverse control	Monitoring of protective doors / Emergency OFF equivalent switching
3	without	equivalent	with	with

Hex-switch 2 and 4 Hex-switchpositions	EDM Stop valve monitoring	slow speed traverse information	* switching over tolerance enhancement of the valve position monitors
1	without	without	+100 ms

Displaying of conditions by the Muting lamp



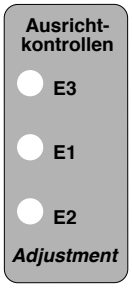
lamp is out (flashing is hardly recognizable) : during the closing movement the proitective field is at least partially avctivated

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 stae. Carry out a voltage reset.

Displaying of conditions by the Ajustment control-LEDs

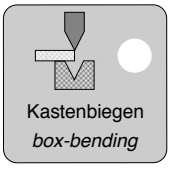


LEDs are flashing slowly about once per second: Press has successfully stopped at the cam during the overrun traverse test, only when the cam is free again, the OSSDs can be enabled again.

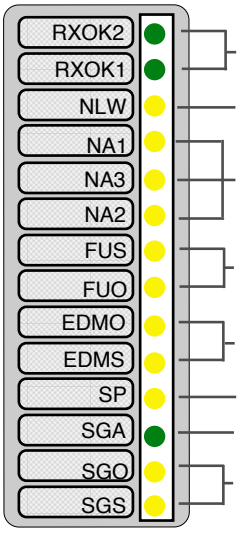
The ajustment controll-LEDs are flashing slowly until the press brake is not opened completely.

see also page 19

Indicator LEDs



LED is on if box bending funktion is activated



Indicator LEDs for in- and outputs	AKAS®- ...F	AKAS®- ...M
Outputs for release of rear stoppers	LEDs are lit if the rear stoppers are free *	-
Input for Overruntraverse controll	LED is lit if the cam is not activated	-
Inputs for control of protective grids or doors and emergency-off circuits	equivalent protective door contacs: LEDs are lit if all protective door circuits/Emergency OFF circuits are closed. antivalent protective door contacs: NA1 and NA3 are lit, NA2 is dark if all protective door circuits/ Emergency OFF circuits are closed	-
Inputs for press start / stop (release of closing stroke)	EDMO: stop = 1 / fast speed = 0 / slow speed = 0 EDMS: stop = 0 / fast speed = 1 / slow speed = X	
Input for stop contactor control	EDMO is lit during STOP state EDMS is lit during downward movement in fast speed	-
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 SGO/SGS: **stop**=not 1/1; **fast speed**=1/0; **slow speed**=0/1 equivalent inputs SGO/SGS: **stop**=1/1 or 0/0; **fast speed**=0/0; **slow speed**=1/1	

* **If the lateral protective doors are open:** all other protective doors / protective circuits must be closed. NA1 must be lit. NA2, NA3 must be dark if the protective door contacts are equivalent. If the protective door contacts are antivalent, NA2 must be lit, and NA3 must be dark. If necessary check the contacts). IF the RXOK-LEDs are not lit, activate the RESET-Button(s). If the LEDs still remain dark, open and close all other protective doors / protective circuits , then activate the RESET-Button(s).

If the lateral protective doors are closed: all other protective doors / protective circuits must be equally closed. NA1 , NA2, NA3 must be lit if the protective door contacts are equivalent. If the protective door contacts are antivalent, NA1 and NA 3 must be lit, and NA2 must be dark . (If necessary check the contacts). IF the RXOK-LEDs are not lit, activate the RESET-Button(s). If the LEDs still remain dark, open and close all protective doors / protective circuits , then activate the RESET-Button(s).

Status messages, warnings and Error reports via the RS 232 serial interface

The AKAS® displays messages by serial transfer via its RS 232 interface; transfer format: 9600 baud, 1 start bit, 8 data bits, 1 stop bit. The messages have even parity and will be repeated at least three times. The time gap between 2 messages is at least 100 ms. At the receiver, defective messages are gated, because only those messages are accpted that fulfil the following conditions: an even parity, successful reception of the message is provided if it is received at least 3 consecutive times and if its complete compatibility to one of the message possibilities indicated below is given.

There are different kinds of messages:

- Information concerning the status of the AKAS® or **handling directions** for the operator, here are Bit 0 and Bit 1 = 1,

- **Warnings** concerning errors that, if received three times one immediately after the other, may lead to the interlocking of the AKAS®, here is Bit 0 = 0 and Bit 1 = 1,

- **Error reports** of the interlocked AKAS® , here is Bit 0 = 1 and Bit 1 = 0.

Status messages, handling directions for the operator (binary xxxxxx11)

background grey: ((other message or no message, if monitoring functions are partially cancelled)

message transferred byte decimal	**operating mode**	**description** possible text in the display system	**handling directions**
3		front reset button does not enable	verify reset button and cable leading to the normally closed contact of the foot pedal if interrupted
3	*antivalent foot pedal inputs without protective circuit monitoring*	*normally closed contact of the foot pedal does not enable*	*verify the cable leading to the normally closed contact of the foot pedal if interrupted*
3	*equivalent foot pedal inputs*	*error at the request for release of the closing stroke*	*check the equivalent switching lines going FUO and FUS . They are evaluated as "different"*
7		Mutinglamp does not light up	see message 63
15		Stop at the overrun traverse cam	during overrun traverse test
15	*without overrun traverse control*	-	-
23		open the press completely in order to quit the safety point range	if this message is displayed after every pressing and releasing of the foot pedal, check the SP connecting circuit for short circuits
39		release foot pedal	
43		overrun traverse OK	during overrun traverse test
43	*without overrun traverse control*	-	-
51		rear reset buuton is defective or the EDM is not in Stop status	check rear reset button for short-circuits
51	*without EDM*	*rear RESET button is defective*	*check rear reset button for short circuit*
51	*without protective circuit monitoring*	*EDM is not in Stop Status*	*Check EDM Signals*
51	*without EDM and without protective circuit monitoring*	*wrong poetntial at EDMO or EDMS*	*check the connectors for short circuits*
63		Mutinglamp does not light up	open the press completely. If this message is repeated at the following new stroke and the internal muting lamp does not light up,there is an internal error at the version that has no connection option of an external muting lamp. With the version with external connection option of an external Muting lamp, the connection KAST must be checked for short-circuits on -.
83		overrun traverse too long	during overrun traverse test
83	*without overrun traverse control*	-	-
95		overrun traverse mearuement has not been carried out	possible reasoin: the protective field is interrupted, or the protective circuit is interrupted, or the foor pedal is released, or no fast speed during the overrun traverse measurement, evtl. because the stroke for the oberrun traverse measurement has not been started by the UDC of the machine. Open the press completely and carry out a new stroke for the overrun traverse measurement.
95	*without overrun traverse control*	-	-

Status messages, handling directions for the operator (binary xxxxxx11)

background grey: other message or no message, if monitoring functions are partially cancelled

message transferred byte decimal	operating mode	description possible text in the display system	handling directions
99		no overrun traverse test was carried out because of slow speed during overrun traverse test	set the switch-over point onto the normally required position, open the press until the machines reaches its UDC and carry out a new stoke for overrun taverse measurement
111		interrupted protective circuit	Release all protective grids and Emergency off buttons
111	*no monitoring of the protective circuit*	*Internal error*	*if this is displayed again after the voltage reset, a verification by Fiessler Elektronik is necessary*
119		error within the protective circuits, re-disable and enable them	open again all protective grids and Emergency off buttons and close them again so that a possible bad contact is activated again
119	*no monitoring of the protective circuit*	*Internal error*	*if this is displayed again after the voltage reset, a verification by Fiessler Elektronik is necessary*
123		error within the protective grids, re-open and close them	re-open and close the protective grids so that a possible bad contact is activated again
123	*no monitoring of the protective circuit*	*Internal error*	*if this is displayed again after the voltage reset, a verification by Fiessler Elektronik is necessary*
131		lateral protective grids are open, *CLOSE!*	close all lateral protective grids
135		lateral protective grids are open, i.e. protection by AKAS® is cancelled, acti-	Press can close only in slow speed
135	*no monitoring of the protective circuit*	*Internal error*	*if this is displayed again after the voltage reset, a verification by Fiessler Elektronik is necessary*
139		error within lateral grids or Emergency-OFF-button, open and close them once	open and close again all lateral protective grids and all Emergency-OFF-buttons so that a possible bad contact is activated again
147		error within rear grids or Emergency-OFF-button, open and close them once	open and close again all rear protective grids and all Emergency-OFF-buttons so that a possible bad contact is activated again
147	*no monitoring of the protective circuit*	*Internal error*	*if this is displayed again after the voltage reset, a verification by Fiessler Elektronik is necessary*
159		Emergency OFF actvated	re-enable emergency OFF button
159	*no monitoring of the protective circuit*	*Internal error*	*if this is displayed again after the voltage reset, a verification by Fiessler Elektronik is necessary*
163		rear protective grid is open	close rear protective grid
163	*no monitoring of the protective circuit*	*Internal error*	*if this is displayed again after the voltage reset, a verification by Fiessler Elektronik is necessary*
175		lateral and rear protective grids are open	close all protective grids
175	*no monitoring of the protective circuit*	*Internal error*	*if this is displayed again after the voltage reset, a verification by Fiessler Elektronik is necessary*
183		activate reset button for the rear protective grid	reset must be actvated after the openring and closing of the protective grids
183	*no monitoring of the protective circuit*	-	-
187		open the press after overrun traverse test	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 press brake is not
187	*no monitoring of the protective circuit*	-	-
195		box bending function is selected	-
207		bending of flat sheet metal	-
215		muting	AKAS@ provides only indirect protection by permitting the closing movement only in slow speed
219		foot pedal is released	during the closing movement, the foot pedal was released
231		interruption of the protective field	during the closing movement, the protective field was interrupted
235		activate emergency-OFF-reset of the grids	after the opening and closing of a protective grid, a reset must be carried out
235	*no monitoring of the protective circuit*	-	-
243		key switch is activated	Disable key switch. If the same message remains displayed, there is a risk of short-circuiting of the normally open foot pedal contact.

Warnings (binary xxxxxx10)
error reports (binary xxxxxx01)

background grey: ((other message or no message, if monitoring functions are partially cancelled)

Warnings issued when several consecutive malfunctions occur that lead to an interlocking of the AKAS with displayed error reports. The interlocking status can be cancelled only by a voltage reset.

Warning transferred decim. byte	**error** transferred decim.byte	**operating mode**	**description** possible text in the display system	**reason for the error**
6	5		EDM does not respond even though the OSSDs are released	If this happens during fast sped: valve position monitors do not switch in fast speed position or at an interruption in the EDMS circuit. If this happens during Muting: EDMS and EDMO are both at + 24 V
6	*5*	*no monitoring of the protective circuit*	-	-
10	9		slow speed signal error	When switching over from fast speed into slow speed, at SGO remains+ 24 V
10	*9*	*with additional safety PLC (e.g. **FPSC**)*	*slow speed signal error*	*When swithcing over vom fast speed into slow speed, the triggereing of the SGS and the SGO is antivalent instead of equivalent*
18	17		machine stops at the overrun traverse cam/ cam switch does not conduct	in the case of "warning": open press completey, in the case of "error": check cable and cam switch
18	*17*	*overrun traverse control*	-	-
30	29		no complete slow speed position in the Muting status	This message is displayed when the stroke is started in slow speed range or with a slow speed request SGA = 0 and if there is no complete switch-over of the slow speed position monitors into slow speed. Check the SGA line for interruptions and check also the slow speed position monitors and their lines.
86	85		Problem release of the rear stoppers	line short circuiting of one RXOX circuit with another line
86	*85*	*no monitoring of the protective circuit*	*internal error*	*if this is displayed again after the voltage reset, a verification by Fiessler Elektronik is necessary*
90 / 102	89 / 101		Problem fast speed -- slow speed request	line short circuiting of the SGA circuit with another line
106	105		fast speed/slow speed signals are faulty in stop status	during operation without safety PLC, both EDMS and EDMO are at + 24 V at the same time in stopped status.
106	*105*	*with additional safety PLC (e.g. **FPSC**)*	*fast speed/slow speed signals are faulty in stop status*	*The triggering of the SGS and the SGO is antivalent instead of equivalent*
114	113		OSSD- error	line short circuiting of the OSSD circuits with other lines
126	125		short circuit of the the muting lamp line	only possible at the version with external Muting lamp, otherwise: internal problem
130	129		problem at request for higher switchover point:	line short circuiting of the HUSP circuit with other lines
142	141		Muting lamp should not light up, release box bending button	short circuit in box bending button or line short circuiting of the KAST circuit with other lines
150	149		problem at pressing of foot pedal	line short circuiting of the foot pedal circuits FUO and FUS with other lines
166	165		Hex switches deadjusted	Readjust the Hex switches onto the selected operating mode, then carry out a voltage reset. If the error repeats itself, a repair by Fiessler Elektronik is necessary.
170	169		invalid Hex switch position	Turn HEX switch into a permitted position
198	197		external transmitter signals are received	The transmitter is triggered although the foot pedal is released, or a transmitter from another AKAS® focuses the receiver. This must be prevented by adequate constructional measures.
interlocking without prior warning	201	*with additional safety PLC (e.g. **FPSC**)*	*unequal slow speed connections*	*This error happens only during the operating mode "for connection to safety PLC" if the signals at the SGO and the SGS are not exactly the same.*
interlocking without prior warning	237		*disable key switch - voltage reset*	*The key switch ot the front reset switch have been activated when the foot pedal was pressed, or there is an error within the foot pedal, or the front reset button does not close.*
246	245		internal error	If this message is displayed immediately after a voltage reset, there is an EMC problem or an internal failure of the appliance.

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 press brake protection systems AKAS® are maintenance-free.
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**	
Muting lamp white, 230V / 7W	**UMLW**	
Safety double foot pedal FL2-528ZSD4-U	**FS2-528ZSD4-U**	
AKAS® Foot pedal for box-bending function	**AKAS/Ped**	

AKAS® accessories (mechanical equipment)

part designation	order code	page
AKAS®-LC Mounting Kit (not swivable) with Holder 2 for mounting at the backfor the AKAS® transmitter and receiver (one pair)	**AKAS/AS/3/LC/ZM**	12 / 15

Inspection Sheet

No.: _____
Date: _____

Inspection of a press brake safeguarded by a press brake protection system AKAS®

customer's order number: _____
company: _____
address: _____
department: _____
Post Code/City: _____
phone: _____
Fax: _____
attending staff: _____
inspecting company: _____
inspector: _____

Hex switch positions: _____
machine builder _____
machine type: _____ Serial no.. _____
machine control by: _____
machine located at: _____
inventory no.: _____
cost centre: _____
type of control: _____
Muting box no.: _____
AKAS® no: _____
AMS no: _____
Sensors 1/2, nos: _____

1. Inspection:

☐ first inspection ☐ maintenance contract existing ☐ regular inspection requested
☐ regular inspection ☐ cost estimate of maintenance contract requested

2. Installation:

detection range: _____ m optional swivable holder at: ☐ transmitter ☐ receiver

3. Visual Inspection of the Installation

☐ 3.1 correct electric connection
☐ 3.2 cables damage free
☐ 3.3 strain relief at both sides of cable loop
☐ 3.4 cable protected against all mechanical damages by metal sheet
☐ 3.5 correct position of vertical light grid (not too far behind from bending line)
☐ 3.6 correct position of vertical light grid (distance sufficiently behind the bending line)
☐ 3.7 transmitter beams are parallel to the ram
☐ 3.8 work speed < 10 mm/s
☐ 3.9 test with test rod passed

3.10 max. work speed: _____ mm/s
3.11 max. fast speed: _____ mm/s
3.12 Overrun traverse of the AKAS® is: _____ mm
when interrupted during fast speed motion

After viewing of the electrical diagrams, the electrical integration of the AKAS® can be accepted as safe according to safety class 4 EN 954T.1, under the condition that the machine control is wired exactly as shown in the said diagrams.

4. Cooperation between the AKAS® system and the machine

☐ 4.1 The stopping of the AKAS® during the dangerous movement complies with the safety level of safety category 4
☐ 4.2 control elements : OK
☐ 4.3 closing movement during foot operated motion with AKAS® only possible when foot pedal remains pressed down
☐ 4.4 interruption of the AKAS® during fast speed: OK
☐ 4.5 interruption of the AKAS® during work speed: OK
☐ 4.6 operation mode „foot-fast motion" is possible only when AKAS® is activated
☐ 4.7 AKAS® is switched off in all operation modes where AKAS® is not activated
☐ 4.8 Muting signal is given if the gap above metal sheet corresponds to distance between „lower edge E2 and tool tip+2mm"
☐ 4.9 Muting signal from valve position signal during work stroke or AMS
☐ 4.10 Muting signal monitored by LSUW N1 Muting K switching unit , safety PLC or machine control.
☐ 4.11 Muting signal monitored by machine control

Muting point in mm: _____

☐ 4.21 PLC input is controlled by ESPE output.
☐ 4.22 Muting signal unsafe
☐ 4.23 Safety level of the following machine control is lower than ESPE
☐ 4.24 Secondary control is single channel

☐ 4.30 The protective effect might be cancelled by a malfunction of the press.

If tops 3 and 4.1 - 4.10 are not completely ticked, or if one or more of the tops 4.21- 4.24 are ticked, the AKAS® installation is **not** in a faultless condition. In this case, the protective effect by the system is not completely provided.

5. Comments

Inspection Badge: ○ badge issued ○ badge not issued

The inspection refers only to the functionality check of the AKAS® according to the regulations. It does **not** replace the safety check of the machine itself. All modifications of the AKAS® or of the machine may impair the protective effect of the AKAS®. In this case, the inspection must be repated.

_____ , _____ .....

FIESSLER ELEKTRONIK

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

GESCHÄFTSLEITUNG

Konformitätserklärung

(gemäß Anhang II 1 A 2006/42/EG)

Wir

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

erklären in alleiniger Verantwortung, daß das Produkt

AKAS LC II M und AKAS LC II F, Berührungsloswirkende Schutzeinrichtung Typ 4 nach EN 61496-1 zur Absicherung des Gefahrenbereiches von Abkantpressen nach EN 12622.

auf die sich diese Erklärung bezieht, mit den folgenden Normen oder normativen Dokumenten übereinstimmen:

EN ISO 13849-1:2008/AC:2009
EN 62061:2005+A1:2013
EN 61496-1:2013
EN 61496-2:2013
EN 12622:2009+A1:2013

Gemäß den Bestimmungen der Richtlinie

2006/42/EG
2004/108/EG

Die Schutzziele der Niederspannungsrichtlinie (2006/95/EG) wurden gemäß Anhang I, Nr. 1.5.1 der Maschinenrichtlinie eingehalten.

Declaration of conformity

(according appendix II 1 A 2006/42/EG)

We

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

declare under our sole responsibility that the product

AKAS LC II M und AKAS LC II F, electro-sensitive protective equipment type 4 according to EN 61496-1 for protecting the dangerous area of pressbrakes according to EN 12622.

to which this declaration relates is in conformity with the following standards or other normative documents

EN ISO 13849-1:2008/AC:2009
EN 62061:2005+A1:2013
EN 61496-1:2013
EN 61496-2:2013
EN 12622:2009+A1:2013

following the provisions of Directive

2006/42/EG
2004/108/EG

The protection goals of the Low Voltage Directive (2006/95/EC) have been complied with in accordance of Annex I No.1.5.1 of the Machinery Directive.

déclaration de conformité

(conforme appendice II 1 A 2006/42/EG)

Nous

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

déclarons sous notre seule responsabilité que le produit

AKAS LC II M und AKAS LC II F, Dispositif de protection électrosensible type 4 suivant EN 61496-1 pour la protection des zo- nes dangereuse des presses plieuses suivant EN 12622.

auquel se réfère cette déclaration est conforme aux normes ou autres documents normatifs

EN ISO 13849-1:2008/AC:2009
EN 62061:2005+A1:2013
EN 61496-1:2013
EN 61496-2:2013
EN 12622:2009+A1:2013

conformément aux dispositions de Directive

2006/42/EG
2004/108/EG

Les objectifs de protection de la directive "basse tension" (2006/95/CE) ont été respectées conformément à l'annexe I n ° 1.5.1 de la directive Machines.

Folgende benannte Stelle hat eine positive Erklärung ausgestellt.

Kennnummer der benannten Stelle 0044
Prüfbescheinigung N° 44 205 12016404
Name: TÜV Nord CERT GmbH

Esslingen, den / the / le 11.12.2015

Götz Fiessler / Geschäftsführer / Dokumentationsbevollmächtigter / managing director / authorized for documentation / gérant / mandataire de la documentation

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 PL e, SIL3
AKAS ® meets Safety Category 4 according to EN 954, e PL (Performance Level) according to EN ISO 13849-1: 2008 and SIL 3 according to EN 62061:2005 Devices to safety category 4, PL e, SIL 3 are self-monitoring sensitive protective equipment and provide the highest Safety class among the sensitive protective equipment.

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 6 m (Optional higher 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.

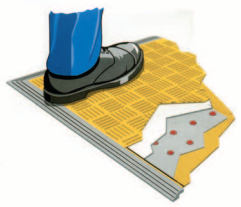
Start interlock
After initial operation or after a power supply interruption a renewed "enabling" is blocked by the start interlock.The renewed release of the switching unit is only possible by closing and opening of the start entry.

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).

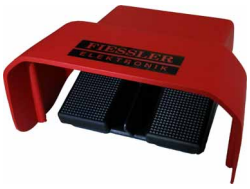
Muting
Short-time safe by-pass of the press brake protection AKAS® during material movement, i.e. during a plate bending process.

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

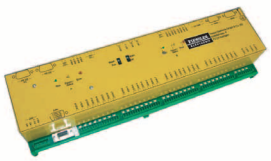
other Safety products



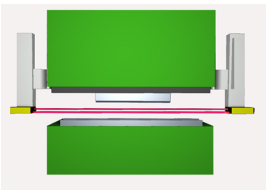
Saftety Mats



Safety-Footpedal

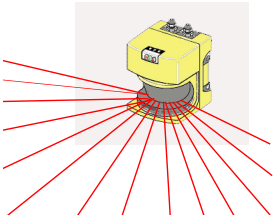


Parametricable Saftetycontrol FPSC



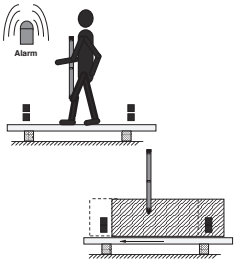
Press Brake Protection System AKAS

Safety-Light-Curtain

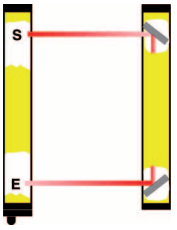


Proximity Laser Scanner

Single-Safety-Beam



Safety-Light-Grid with muting function



Safety-Light-Grid

Service

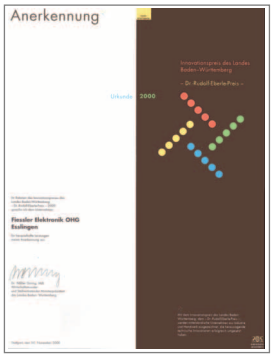
As a special feature for training our customers, Fiessler Elektronik offers one-day safety workshops.
Our service team provides you with expert advice and information for the reliable integration of our safety equipment into your machine.

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.

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 representations in all major industrial nations.