

Instruction Manual

Changes are reserved



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Safety Instruction

**Read and understand this section prior to installing and operating the system SBMA
Please observe always!!!**



Safe operation of the entire equipment is only ensured by compliance with these operating instructions and observation of the corresponding accident preventing regulations. These operating instructions are component of the light barrier and must be kept at the location where the light barrier is installed.



These Operating Instructions are exclusively valid for the SBMA series.

Attention is drawn to all safety instructions marked by this signal and must be strictly observed.

These operating instructions provide to the user important information concerning the correct use of the SBMA. 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.

Read the operating instructions

All requirements detailed in these operating instructions must be strictly observed.

Other relevant regulations and the requirements of the employers' liability insurance associations have also to be complied with.



Qualified personnel

Before the initial operation of the SBMA the operating instructions must be read.

Safety Warning

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

Light barriers do not protect anybody from machine-caused flying objects.

The SBMA 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 protective function of the system is cancelled when the punch is on the sheet metal and the folding machine switches over into turning mode.**

The front beam which is turned to the operator does not protect, if the box-bending function has been activated earlier.

The SBMA does not provide any protection if deadjusted or if wrongly adjusted.

A-Test:

putting into operation



B-Test: daily check

(at least every 24 hours)



TEST

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

- 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 folding machine must be equipped completely with the heaviest upper tool.
- The B-Test must be executed with the smallest and the largest tool at full gripping.
- Start of the closing movement from the maximum top dead centre (T.D.C) at the fastest speed adjustable by the operator.

At the beginning of each shift and after each change of tools, the SBMA must be checked as follows (see also pr EN 12622.2002):

Test must be carried out at both left and right ends of the bending punch during the box-bending mode.

The test piece must not be touched.

- a.) Place the test piece on the matrix in position "10" in a way that step "15" is located at least 10 mm in front of the bending line.

Now start the close down movement of the folding machine.

- b.) The folding machine stops.

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

- d.) Drive up the folding machine. Place the the test piece in position "35" on the table.

Now start the close down movement.

- e.) The folding machine must stop in a way that the tool does not touch the test piece ("35").

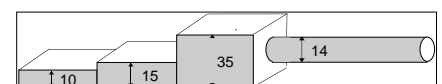
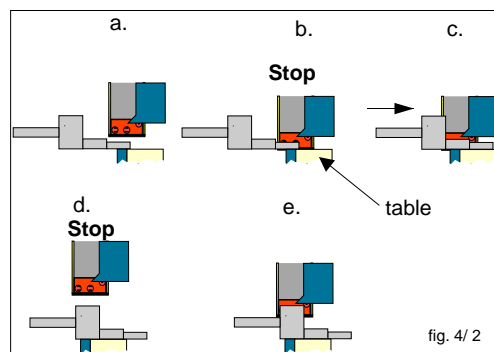


fig.4/1

fig. 4/ 2



If the machine does not stop before touching the test piece, do not continue operating the folding machine!! The folding machine and the adjustment of the SBMA must be verified prior to a new set-up of the machine.

- Electrosensitive protective equipment** The Safeguards for folding machines SBMA is an electrosensitive protective device (ESPE). ESPE is characterised by the fact that a hazardous motion becomes interrupted or prevented if the **light beams** produced between the transmitter and receiver unit are interrupted.
- Safety category 4** The SBMA fulfils the safety category 4, in compliance with EN 954. Devices of safety category 4 are self-monitoring electrosensitive protective devices (ESPE) and represent the highest safety class among the ESPE
- Self-monitoring** The electrosensitive protective device (ESPE) switches automatically into the "safe state" when it is faulty.
- Standard Installation range** Maximum distance between transmitter and receiver is 6 m (For longer range please get in contact with Finessler 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 machine).
- 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).
- Box-Bending** By-pass of the receiver units E1, E2, E3, E4 during a box-bending process.

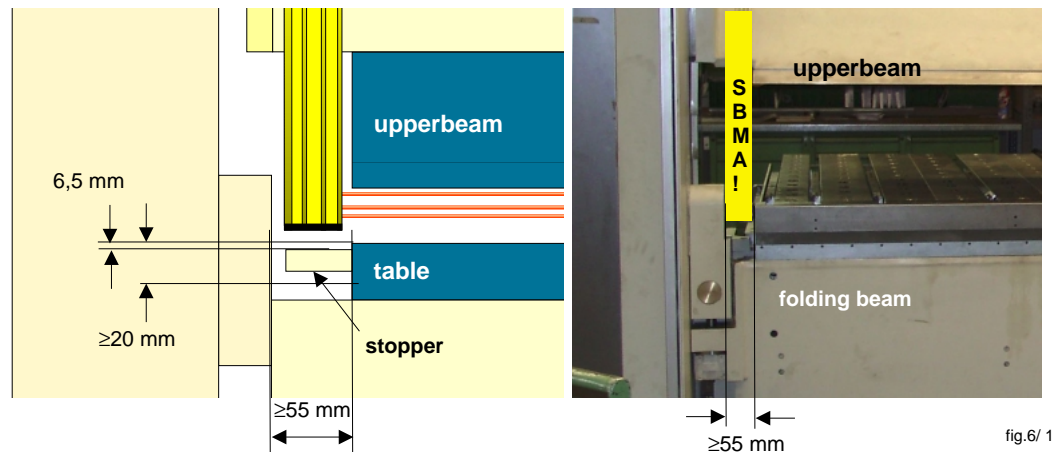


fig.6/ 1



- On both sides of the machine, there must be enough space for mounting the SBMA (see fig. 6.1)
- The hazardous state of a machine must be ended by using the sensor function.
- Any unintentional repetition of a hazardous motion must be safely prevented.
- 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.
- The overrun traverse including the response time of the SBMA must be less than 12 mm.
The overrun traverse that is provided when using the SBMA is normally considerably shorter than the overrun traverse when using the Two-Hands Control, because the SBMA controls directly the machine drives.
- Use only tools with equal constructional heights in one gripping. When tools with different constructional heights are used, the SBMA does not provide sufficient protection.
- Laser beams may be deviated due to air currents, this may cause unwanted and unforeseen machine stops. Therefore the machine must be erected at a place free of air currents.
- Acceptance test:
the installation acceptance test and inspections has to be conducted by a competent person in possession of all the information supplied by the manufacturer of the machine and the ESPE.
- Annual test:
The operator should ensure 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.

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.

The laser - accident preventing light barrier SBMA 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 of the SBMA. By this means the movement of the machine is stopped, before it comes to an injury.

SBMA

- meets IEC 1496, 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 SBMA series are:
Folding machines

SBMA

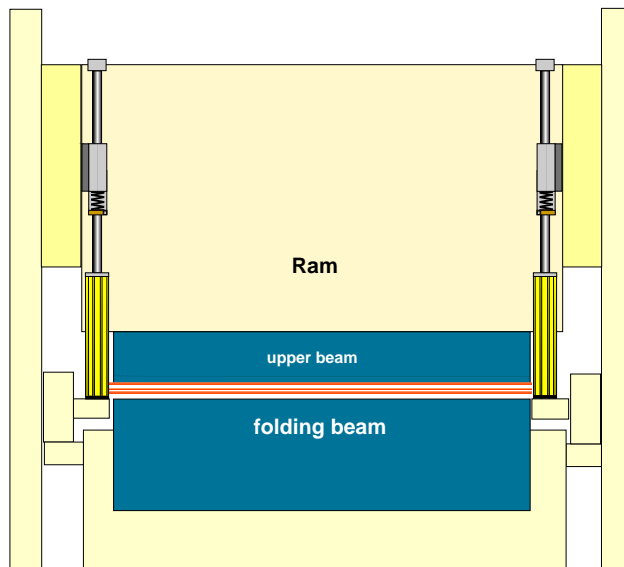
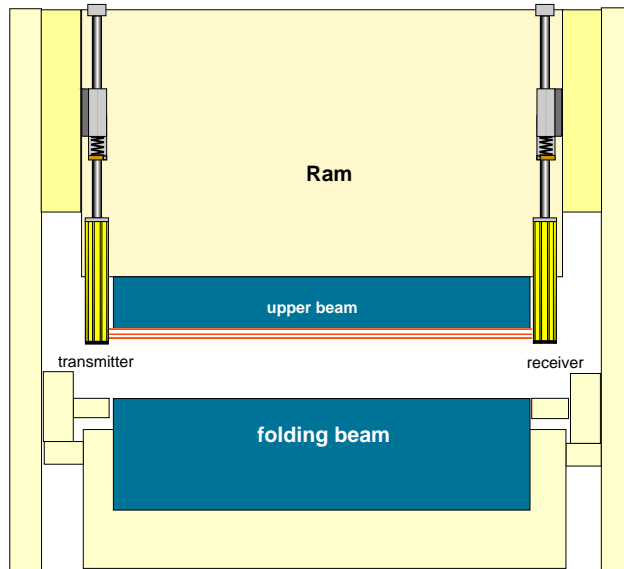
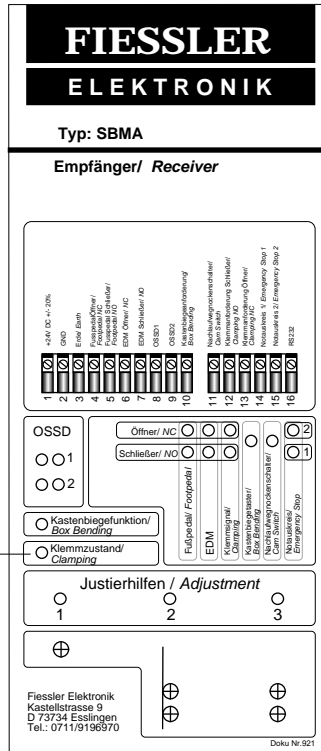


fig. 7/ 1

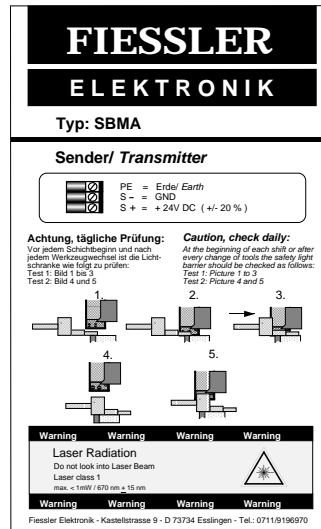
Type plates The type plates are located at the front side of the support housings of both transmitter and receiver.

SBMA



- if lights up permently , the sheet metal is fixed
- if flashing, foot pedal can be released

fig. 8/ 1



fig/ 2

The folding machines system AKAS®-II is a laser-optical safety device. The system is combined fixed with the ram. If the ram moves, the system SBMA will move also with the ram. The system is located underneath the upper beam. Thereby the area underneath the upper beam is protected. If one of the laser beams is interrupted, the system SBMA will switch off the movement of the machine.

Warning	Warning	Warning	Warning
Laser beam Don't look in the beam Laser clas 1 max <1 mW / 670 ± 15 nm			
Warning	Warning	Warning	

fig9/1

transmitter The transmitter generates 3 visible alternating laser beams.

receiver The receiver consists of 5 receiver elements E1, E2, E3, E4, and E5.

Schematic of function

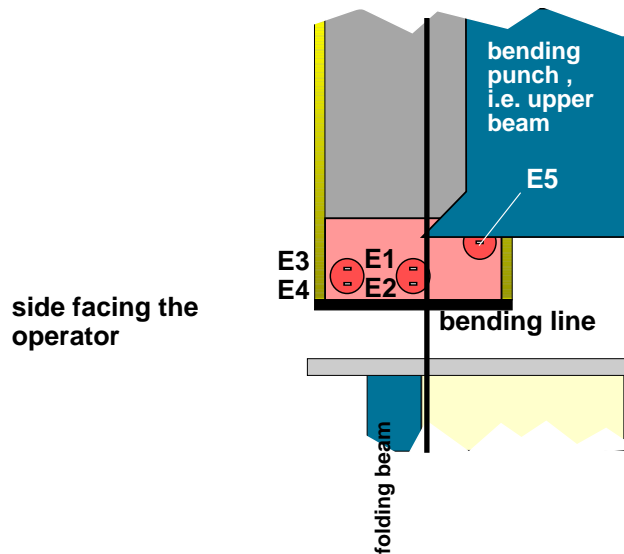


fig.9/2

The SBMA safeguard for folding machines has 5 receiver Elements E1 - E5. These 5 elements form 5 detecting beams by using the 3 adjacent laser beams. The receiver elements E1 - E4 are located in front of the bending line and underneath the upper beam (bending punch). This enables the presence of 4 detecting beams at the front, which precede the movement of the punch during the closing movement, and by that detect the presence of an object, e.g. the operator's finger or hand. If those detecting beams are interrupted, the safety outputs are opened, the closing movement of the folding machine will be stopped and any injury of the operator by the machine will be prevented.

However, the receiver elements E1 - E5 only provide sufficient protection if they precede the punch during its movement. In order to ensure this, the receiver element E5 verifies during the release of the closing movement whether the SBMA is adjusted in a way that E1 - E4 precede the pending punch sufficiently.

For the bending of a box-shaped item the receiver elements E3 - E5 can be blanked by requesting the box-bending function. The already bent lateral parts of the item before and beyond the bending line will not be detected as obstacles that interrupt the beams, and their presence will not stop the machine movement. But, any finger that remains in the bending line will still be detected by E1 and E2.

SBMA System with following ram

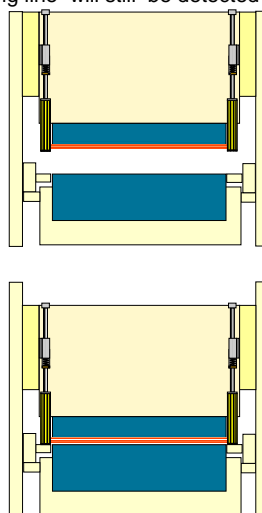


fig. 9/3

Bending of flat metal sheets

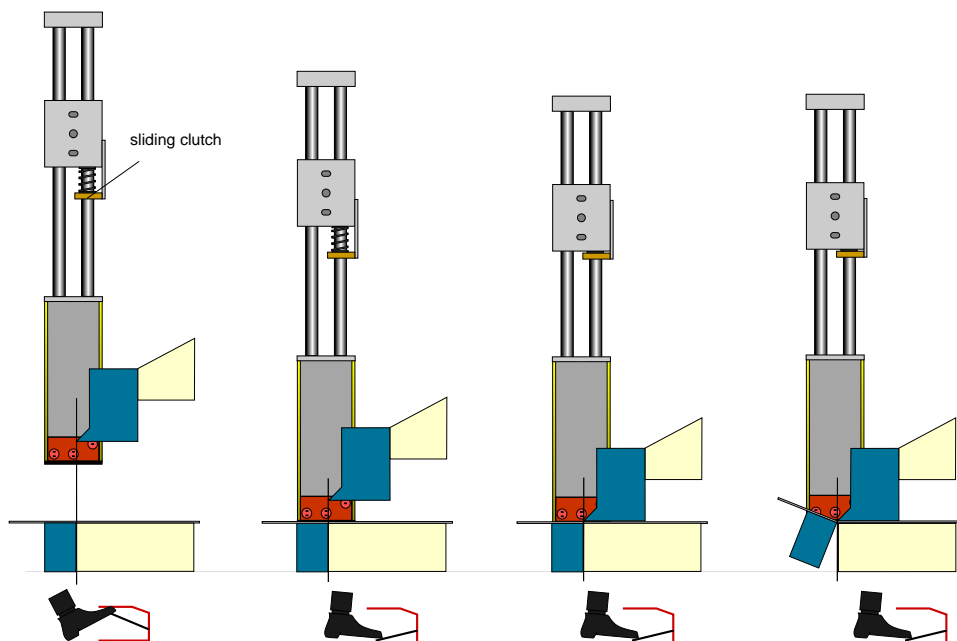


fig.10/1

At the start of the closing movement, all receiver elements must be free, i.e. the beams must not be interrupted. As soon as the foot pedal is activated, the system verifies whether the receiver element E5 received an optical impulse from its corresponding laser transmitter. In that case, the closing movement is started and the receiver element E5 is muted. As soon as the punch tip has touched the sheet, the SBMA is completely muted as soon as the machine switches over into the folding stage. The protection of fingers or hands during the clamping movement is no more necessary.

Bending of box-shaped sheets

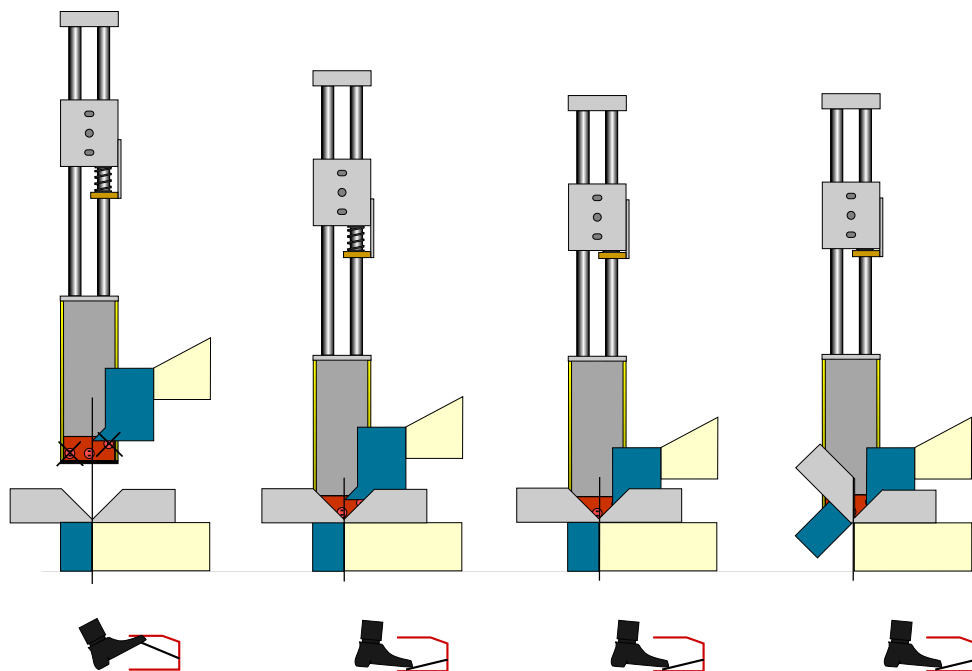


fig.10/2

If a box is bent, the previously bent side part of the box interrupts the light beam of the receiver element E3, E4 and E5 right before these are muted completely by switching over into the folding stage. The hazardous motion is interrupted, although there is no part of the body in the dangerous area. To prevent this, the operating mode "box-bending" must be announced to the system by operating the "box-bending button" before bending a box. When releasing the button, the box-bending demand will be activated and the receiver element E3, E4 and E5 (see fig. 9/2) gets muted and deactivated. This condition is displayed by a yellow LED at the front plate of the receiver.

However, the interruption of the light beam of E3, E4 and E5 by the sidewalls of the box does not lead to a switching off of the downward movement (Fig. 10/2). The receiver elements E1 and E2 remain active until the switching over into the folding state mutes the complete receiver. After the bending process the function of box-bending will be cancelled.



When folding pieces with lateral bent walls, which must be led by the fingers for bending, the function of box-bending must be selected, as otherwise the fingers would interrupt E3 and E4 and would lead to the switching off of the bending process !
 With activated function of box-bending the finger is not detected as shown in Fig. 11/1!

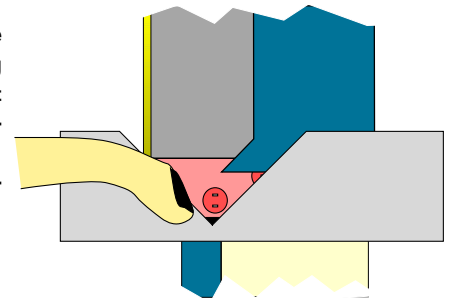


fig11/1



If the machine does not switch over into the safe slow speed of < 10 mm/s after the SBMA touches the stops, the SBMA provides only limited protection of the fingers when the box bending function is selected, if the fingers slip on the sheet beneath the punch shortly before the punch touches the sheet .



If the box bending function is selected, the correct adjustment of the SBMA is not monitored by E5.

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).
The guiding rails are made of high-precision polished steel rails.

Fastening M8 screws or M5 Screws on bearing blocks, three M6 Screws for adjustment

Protection system transmitter and receiver IP 54

Dimensions

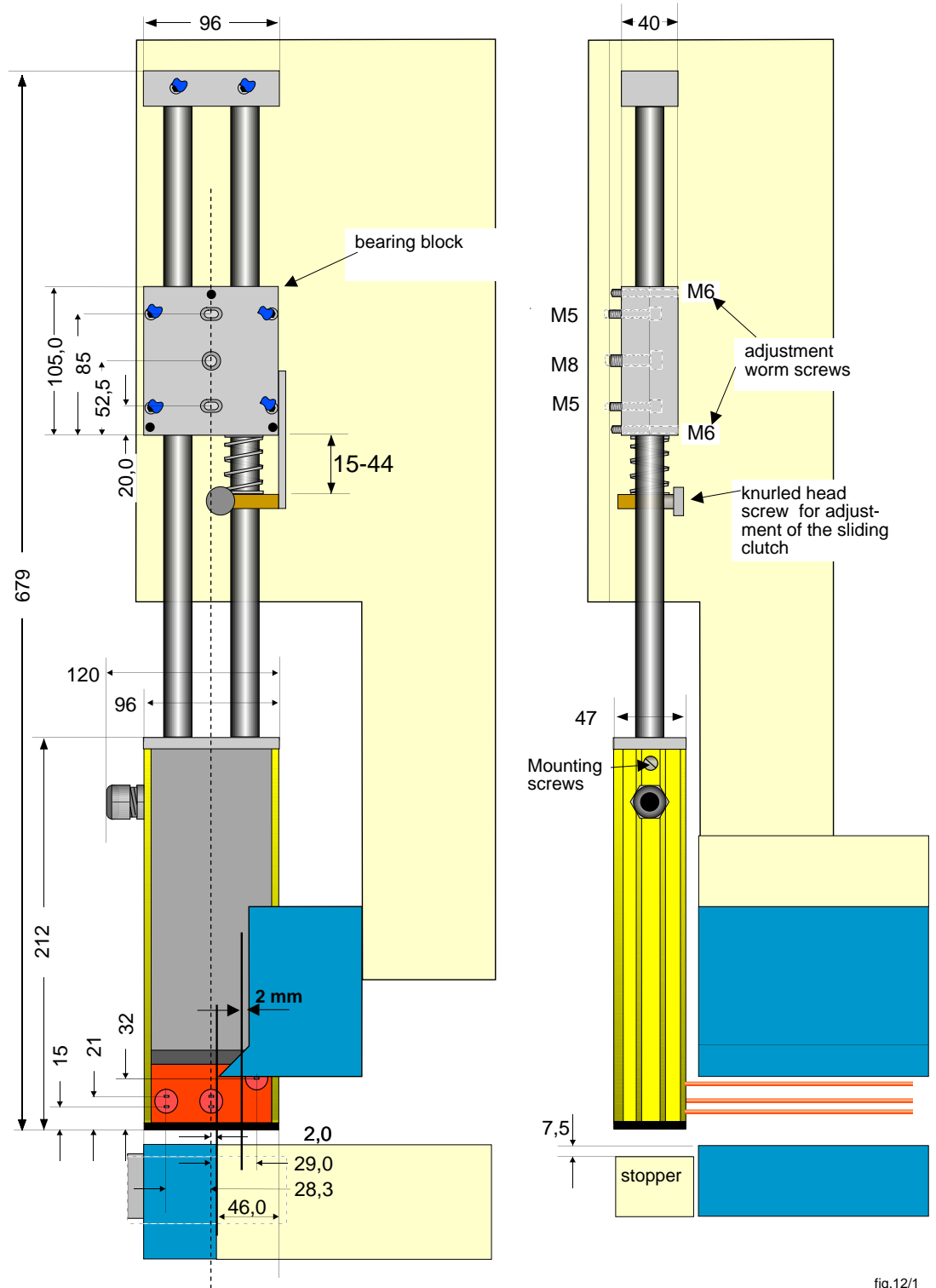


fig.12/1

max. Standard-Range 6 m

max. positioning (sliding) range 260 mm
(on demand, larger positioning (sliding) ranges are available)

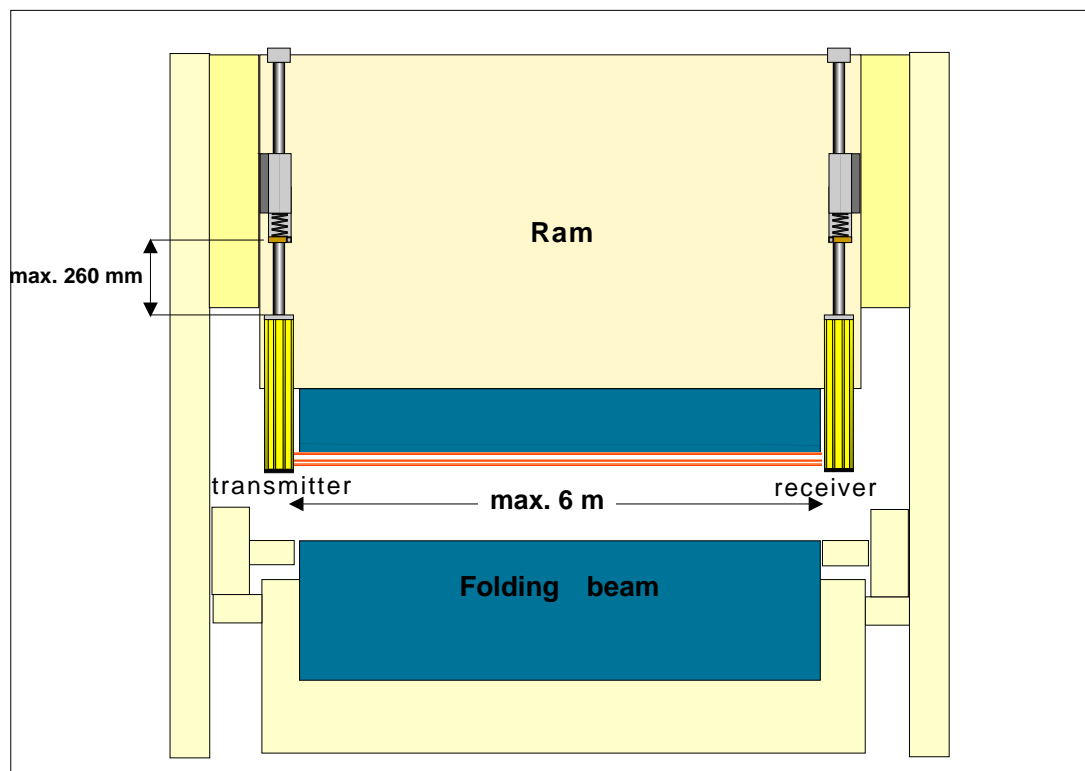


fig.13/ 1

How to proceed



How to proceed during the first mounting of the SBMA

1	Construction of the mechanical fastenings	see chapt. 6.1.1
2	Installation of the transmitter and the receiver	see chapt.. 6.1.2
4	Electrical connection	see chapt. 7
5	adjustment of the SBMA 1. transmitter adjustment 2. receiver adjustment	see chapt. 6.1.3
6	Verification of electrical connection on function and compliance with safety class 4	
7	Execution of the A-Test	page.4

fig.14/ 1



To guarantee a trouble-free operation, both the receiver and the transmitter must be fixed at solid, deformation-free plane-parallel constructions at the ram. The bearing blocks must be mounted in a way that the adjustment screws and the fixing screws are easily accessible. Pay attention to avoid any deformation of the bearing blocks. The worm screws for the fine adjustment require special sensitiveness when turned. If the bearing blocks are treated with force, it may happen that they get distorted, this may lead to an inaccuracy and sluggishness of the guiding rails.

Let fall a perpendicular through the center of the M8 boring for fastening the bearing block. It must be located exactly 2 mm in front of the punch top (bending line), see fig. 12/1.

Installation example



fig. 15/1



- The mechanical fastenings must consist of deformation-free material.

The supports of the transmitter and the receiver must be connected fixed with the ram.

The SBMA transmitter and receiver must be mounted in a way that the mark of the receiver is located exactly on the bending line (Fig. 16/1). The receiver elements E3, E4, E1 must face the operator.

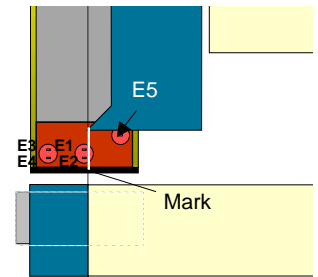


fig.16/1

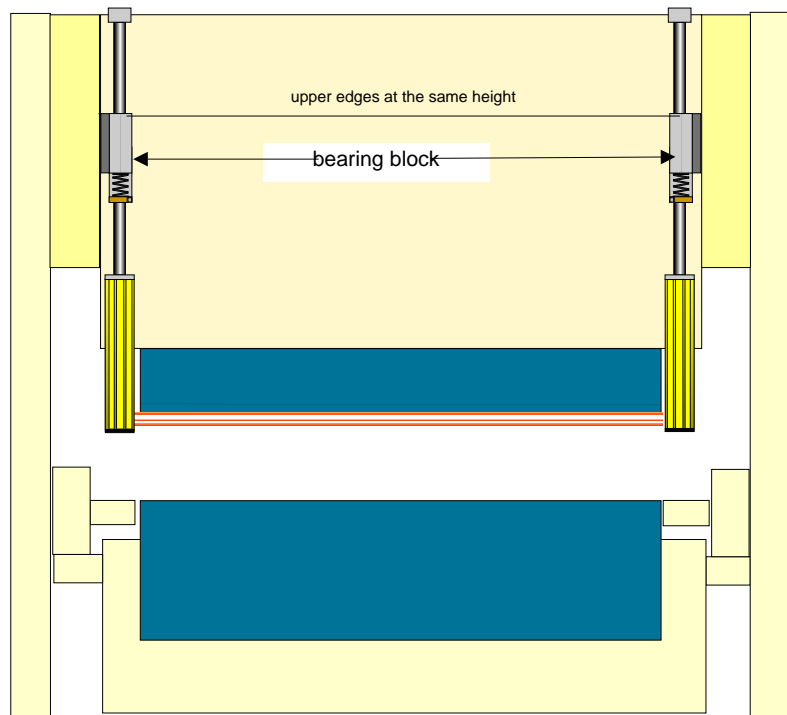


fig. 16/ 2

The upper edges of both bearing blocks should be at the same height.

The bearing blocks must be mounted in a way that the receiver element E5 is still free when using the highest (biggest) upper tool (i.e. upper beam, stamp, punch). When using the lowest (smallest) punch, there should be a reserve-distance of at least of 10mm between the sliding clutch and the light guard cover.

Drop a perpendicular from the punch tip and optically adjust the receiver by using the M4 adjustment screws in a way that the mark at the front side of the receiver meets the perpendicular (see fig. 16/3). Verify this within the entire sliding range.

The transmitter must be mounted in a way that its mark, too, meets the perpendicular of the bending line the same way the receiver does.

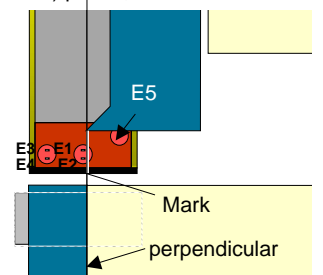


fig. 16/3



Transmitter and receiver of the SBMA should not be subjected to mechanical stress. To prevent this and to protect the SBMA from any damages, a solid protection cap should be always mounted. It must be made sure that no solid objects can be placed directly beneath the SBMA or beneath its mechanical fastenings, in order to exclude any damage of the SBMA caused by a collision during the closing movement of the folding machine!

mechanical stop

At the housing of the machine or at the machine table there must be installed stops on the transmitter and on the receiver side. (see fig. 167/1). These stops must be mounted at 6,5mm beneath the upper edge of the table plane-parallel at a rectangular position.



The position of the stops must not exceed this height. If they do exceed this height, a finger tip of 10mm height that is placed on a thing metal sheet, will not be detected.

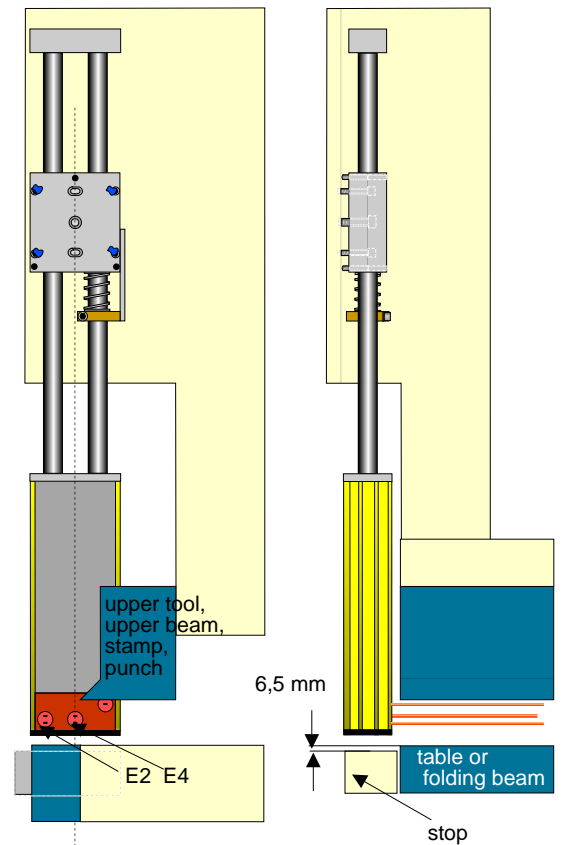


fig 17/1

Function

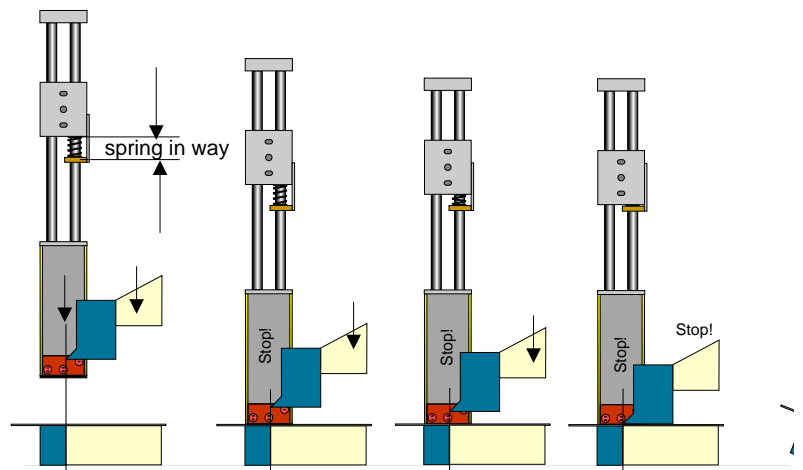


fig. 17/2

Shortly before the punch touches the metal sheet, the SBMA-transmitter and the SBMA-receiver will be stopped by means of the stops. This prevents the receiver elements E2 and E4 from being interrupted by the metal sheet that is going to be bent.

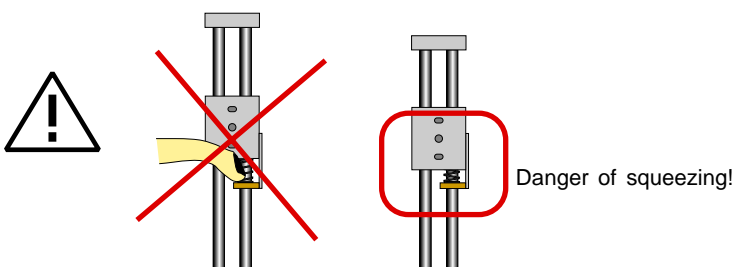
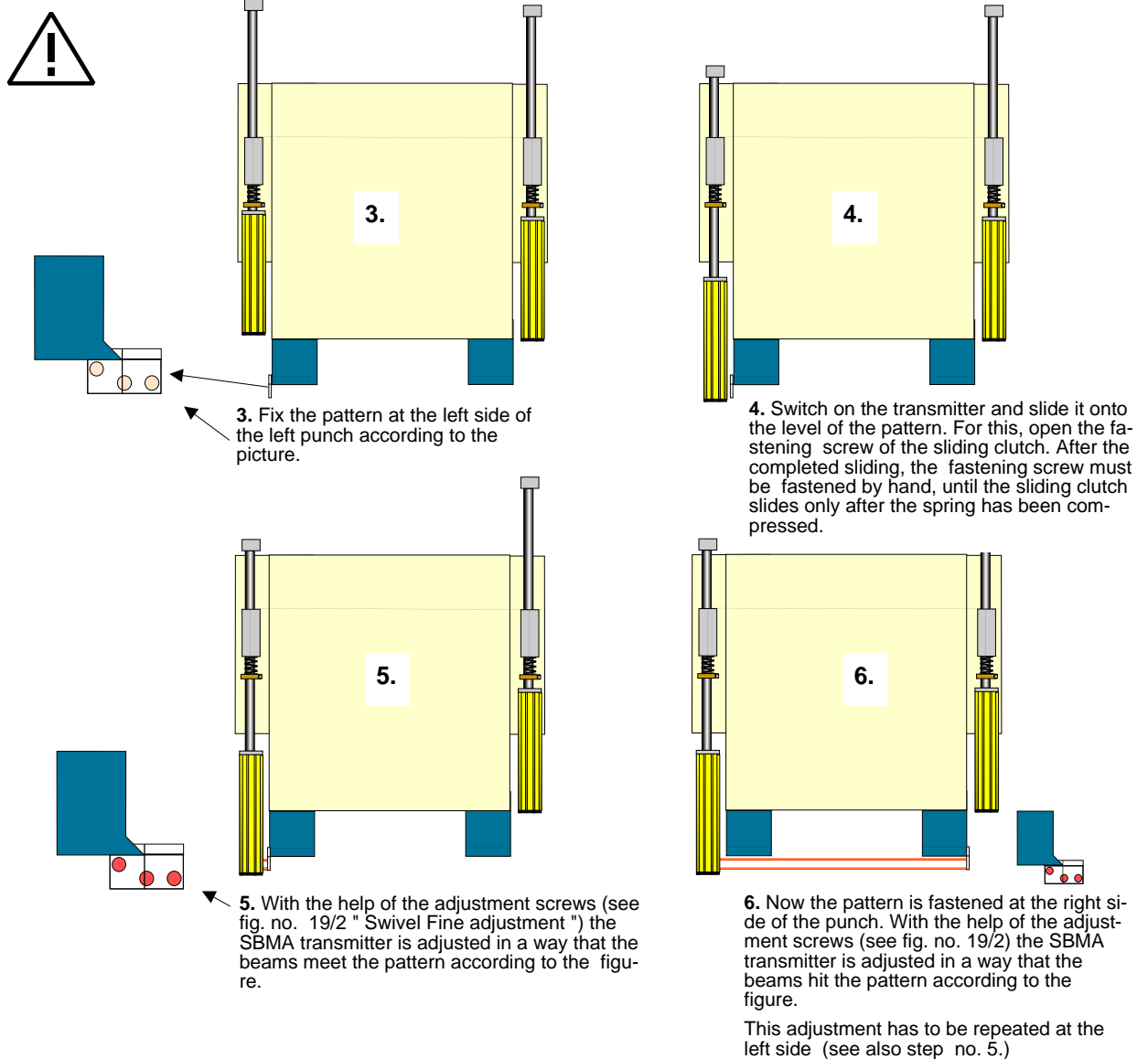


fig.17/3

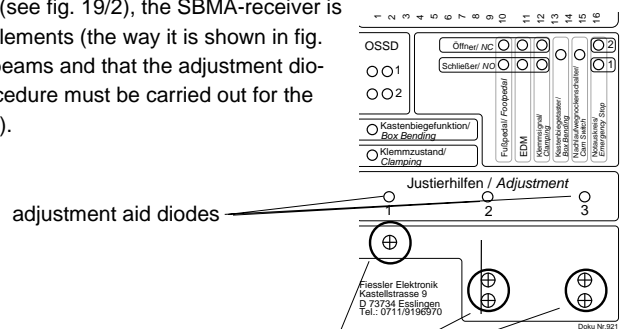
Always start the adjustment procedure at the transmitter.

Only after successfully having completed the transmitter adjustment, the receiver is adjusted relating to the transmitter.

1. Cut out a pattern that is available in chapter 11.
2. Clamp the lowest punch at least at the right and left end of the ram.



7. Repeat steps 2.- 6. using the biggest punch.
8. Check once more the adjustment for the lowest punch.
9. Remove the pattern and slide the receiver in a way that the laser beams lock onto the receiver elements.
10. By using the adjustment screws (see fig. 19/2), the SBMA-receiver is adjusted in a way that the receiver elements (the way it is shown in fig. 18/2) are in the center of the laser beams and that the adjustment diodes switch over to "green". This procedure must be carried out for the biggest and the smallest tool (punch).



Pattern of the laser beams on the receiver when correctly adjusted.

fig. 18/1

fig.18/2

11. Push down as much as possible the transmitter and the receiver when the folding machine is opened at its maximum (see fig. 19/1). For doing this, open the fastening screws of the sliding clutch. After the completed sliding, the fastening screw must be fastened by hand, until the sliding clutch slides only after the spring has been compressed.

12. Close and re-open the folding machine. If the stops at the left and the right side are at the same level, the laser beams must hit the receiver as shown in fig. 18/2.

13. Execute the A-Test as described on page 4.

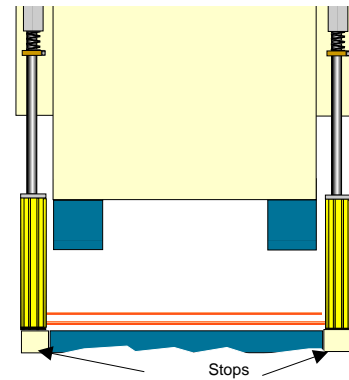


fig.19/1

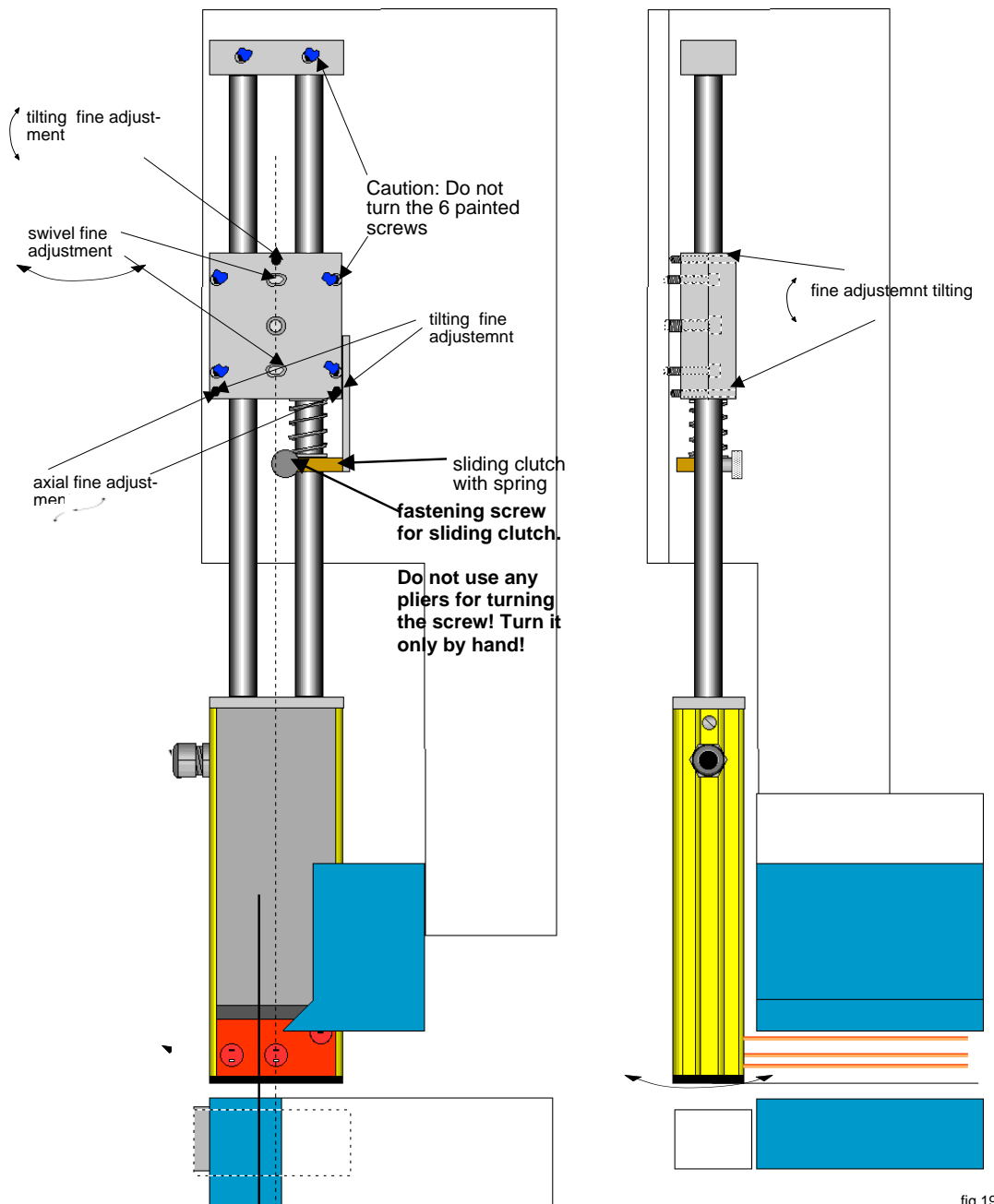


fig.19/2

Verification of the correct position of the Stops:

- SBMA is adjusted to the punch, as described in chapter 7.1

1) Put a metal sheet of 8mm thickness on the table

2) Proceed with closing movement

3) The punch must close until the sheet metal is stuck. Should the SBMA stop the closing movement, the positions of the stops are too far down. The stops must be positioned further up.



4) Execute the **B-Test** (see following pages or page 4.) in order to verify if the position of the stops is too high and if the greatest allowable overrun traverse of 12 mm is not exceeded.

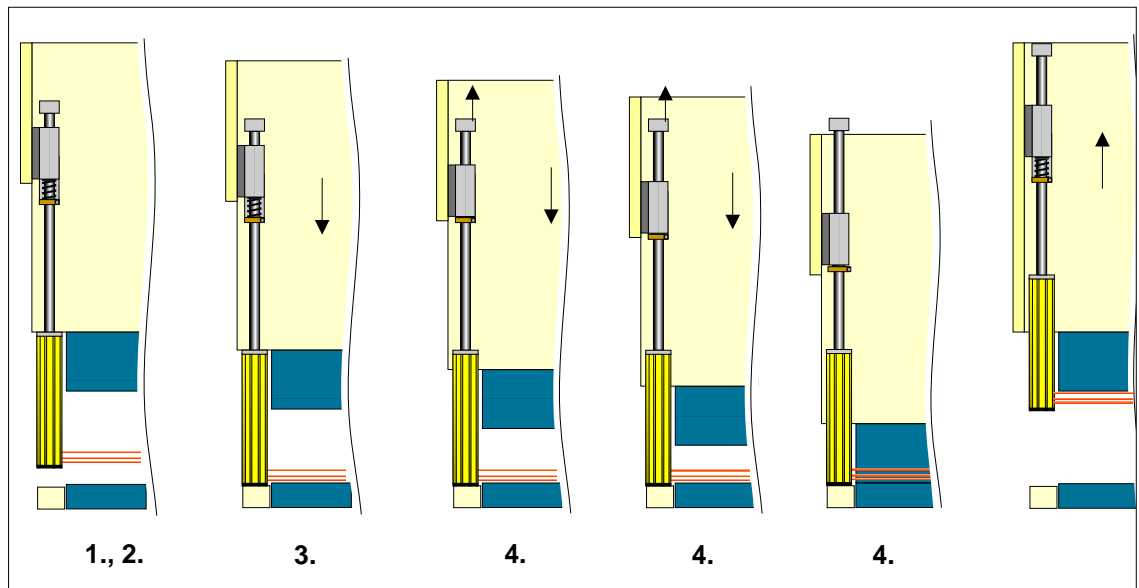


fig.21/1



1. Push downwards the receiver and the transmitter as much as possible when the folding machine is completely open.
For doing this, open the fastening screws of the sliding clutch. After having pushed down the components, the fastening screw must be fastened by hand, until the sliding clutch slides only after the spring has been completely compressed.



2. Fasten the punch (*i.e. upper tool or upper beam*) at the ram.
3. Start the closing movement **without inserting any metal sheet**.
4. The SBMA will move automatically into the correct position by moving until it reached the stops.
5. **Verification of the correct adjustment according to the B-test indicated on page 4.**



If the fastening screw at the sliding clutch is not properly fastened, the SBMA transmitter or receiver will not move upwards during the opening movement of the folding press.

In this case there is no protection at the upper edge of the workpiece, when box-shaped items are bent.

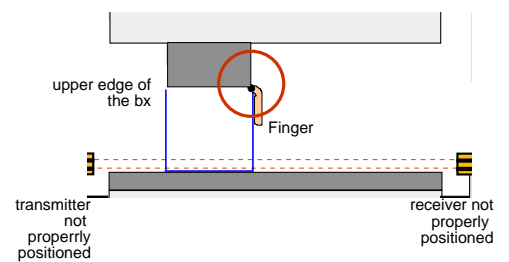
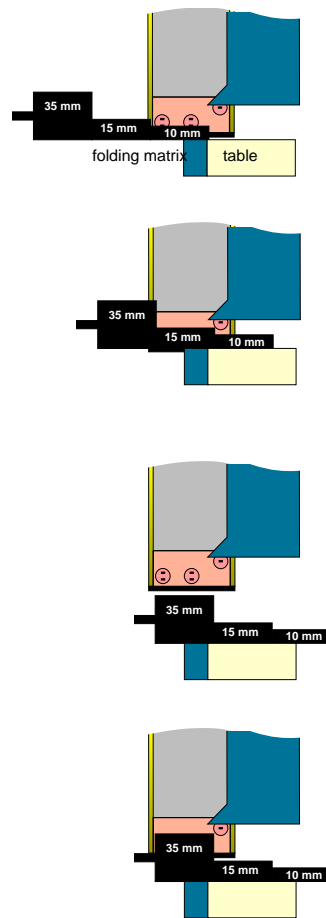


fig. 21/2



1. Adjust the SBMS onto the respective punch dimensions as described in chapter 7.1.

2. Select the box bending function.

3. Place the test piece (which is included in the delivery of the SBMA) on the table, i.e. on the folding beam.

4. Execute one closing movement.

5. The SBMA detects the 10 mm stage and stops the closing movement.

6. Check if the 15mm stage fits between the table and the punch that has stopped.

7. Open the machine

8. Place the test piece (which is included in the delivery of the SBMA) using the 35 mm stage, on the table, i.e. on the folding beam. Select the box bending function

9. Execute one closing movement.

10. The punch must come to a complete stop without touching the test piece.

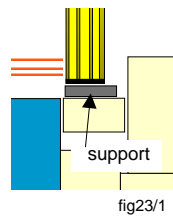
fig 22/3

Possible malfunctions and their remedies

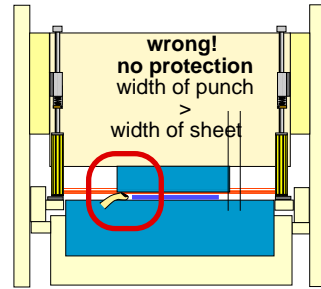
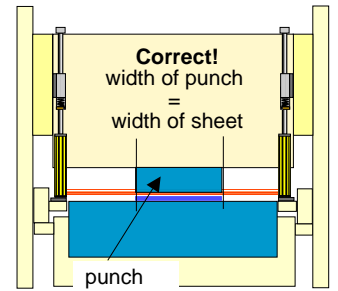
	problem	remedy
to step 5:	If the 10 mm test piece sector is not detected, then the position of the stops is too high or the position of the SBMA is much too high.	Adjust the stops further downward or execute the procedure that is explained in fig. 21/1.
to step 6:	If the 15 mm does not fit between the table and the stopped punch i.e. upper tool, the overrun traverse of the machine is too large.	Apply constructional means that enable the reduction on the overrun traverse of the machine or reduce the closing speed.
to step 10:	If the stopped punch touches the 35 mm stage of the test piece, the overrun traverse of the machine is too large.	Apply constructional means that enable the reduction on the overrun traverse of the machine or reduce the closing speed.

fig.22/4

The correct position of the stops allow the use of sheets of thicknesses of max. 8mm, ripples of the surface included.



If the stops are moved upwards due to the use of thicker sheet, (see fig. 23/1), the length of the utilized punch must correspond only to the width of the utilized punch, due to the fact that beside the sheet, there is no protection of the finger tips. When thinner sheet metal is used, any supports must be removed from the stops.



Electrical data

Connection type Plugs and respective plug base, cables are lead through cable screw fittings.

Operation voltage 24 V DC - 20 %, + 20 % levelled

Max. power consumption max. 3 A (24V DC)

Protection against incorrect connection Protection against all possibilities of errors is not provided.

Switching functions OSSD1 and 2: fail-safe PNP outputs, max. 0,5A, short-circuit and side-current monitoring

Switching voltage 24 V DC

Load current max.0,5A

Load capacitance non-inductive. In the event of an inductive load a spark-quenching elements must be connected parallel to the load (e.g. 0,22 μ F, 220 Ω).

response time 2ms

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 and that there is no possibility of the conductors or cable short circuiting. For that reason the cable must be installed in a reinforced hose if not protected by the machine.



Ambient conditions of the switching units

Ambient Operation temperature 0 to 50 °C

Ambient temperature during storage and transport - 25 to 70 °C

Protection/enclosure IP 54



Only if the accident preventing light barrier SBMA has been connected according to the circuit diagrams detailed below, 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.

Connection The plugs and their corresponding plug sockets are located on the transmitter and on the receiver housing. To connect the components, the yellow aluminium housings have to be removed from the mounting block (see fig. 25/1 step 1.). For doing this, remove the 3 flat head bolts at the 3 sides of the housing. After having loosened the screws, the housing has to be removed from the mounting block. The cables are lead through the cable screw fittings, and the individual wires are connected to the plugs according to the connection circuit diagram (fig. 25/1 step 2.). Then the plugs are mounted on the plug socket and the housings are once again mounted on the mounting blocks. (fig. 25/1 step 3.).

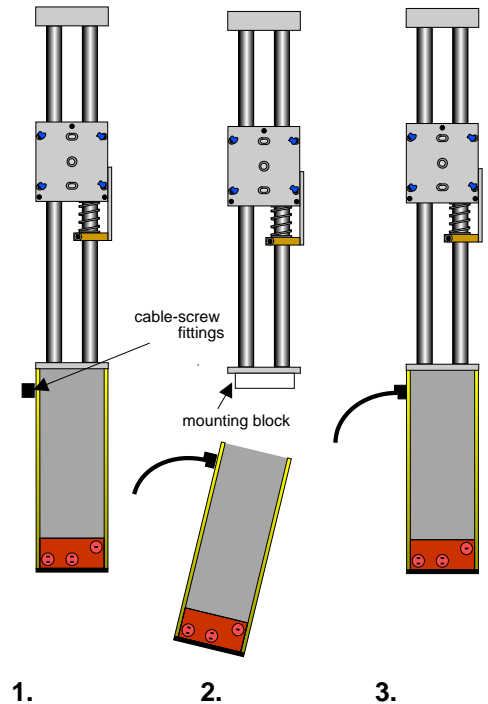


fig 25/1

terminal assignment SBMA - receiver

1		+24V DC +/- 20%
2		GND
3		Erde/ Ground
4		Fusspedal Öffner/ Footpedal NC
5		Fusspedal Schließer/ Footpedal NO
6		EDM Öffner/ NC
7		EDM Schließer/ NO
8		OSSD1
9		OSSD2
10		Kastenbiegeanforderung/ Box Bending
11		Nachlaufwegnockenschalter/ Cam Switch
12		Klemmanforderung Schließer/ Clamping NO
13		Klemmanforderung Öffner/ Clamping NC
14		Notauskreis 1/ Emergency Stop 1
15		Notauskreis 2/ Emergency Stop 2
16		RS232

fig 25/2

SBMA - transmitter

	PE = Erde/ Ground
	S- = GND
	S+ = +24V DC (+/- 20%)

fig 25/3

Operating modes

By using the DIP-switches inside the receiver housing, different operating modes, i.e. functions are available.

after having selected a function. The individual components, i.e. the input/output signals have to be connected to the SBMA receivers,

The access to the DIP-switches is realised by a cable screw fitting which is located at one of the side panels of the receiver housing.

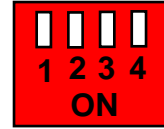


fig 26/1

	1	2	3	4	SMBA connected with a safety PLC	NLW (overrun traverse measuring)	Emergency OFF	foot pedal equivalent	Foot pedal antivalent	EDM
1	on	on	on	on	X			X safety PLC monitors cross currents (SQU)		safety PLC executes EDM (SEDM)
2	on	off	on	off					X	X
3	off	on	on	off	X				X	(SEDM)
4	off	on	off	on	X	X			X	(SEDM)
5	off	off	off	off		X			X	X
6	on	on	off	off	X	X		X (SQU)		(SEDM)
7	on	off	off	on			X		X	X
8	off	off	on	on		X	X		X	X



Electrical connection: The cable laying must be arranged in a way that no mechanical damage of the cables is possible.

fig26/2

OSSD1 & OSSD2 Safety output for the stopping of the closing movement and of the folding movement. VCC max. 0,5 A

EDMS (External Devices Monitoring) For the monitoring of the succeeding switching elements. Has to be active during the closing movement + VCC and has to be open during the stop.

EDMO (External Devices Monitoring) For the monitoring of the succeeding switching elements has to be open (inactive) during the closing movement and the folding movement and has to be active during Stop + VCC.

FUS Connection for the normally open contact of the foot pedal. If the foot pedal is pushed down, + VCC has to be active, when the foot pedal is released the contact has to be open.

FUÖ Connection for the normally closed contact of the foot pedal, if the foot pedal is pushed down the contact is open, when the foot pedal is released, + VCC has to be active.

KLS Open during closing movement, + VCC must be connected during folding movement.

KLO VCC must be connected during closing movement, open during folding movement.

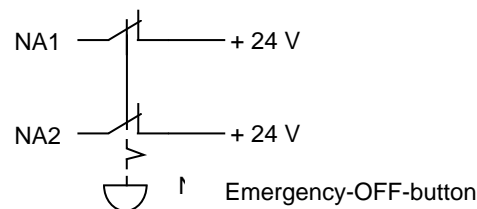
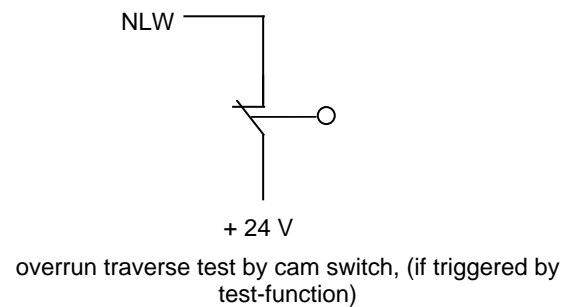
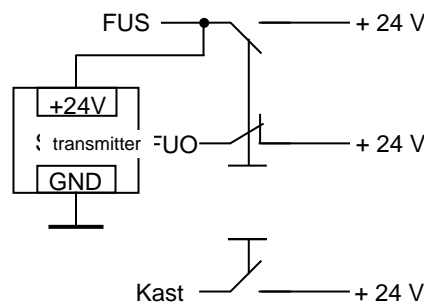
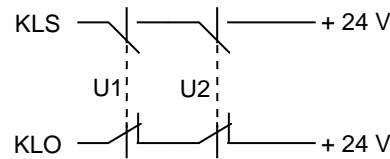
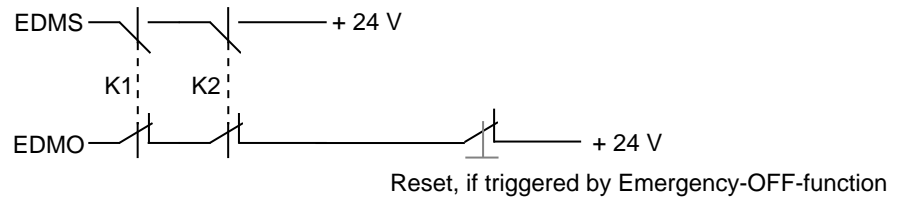
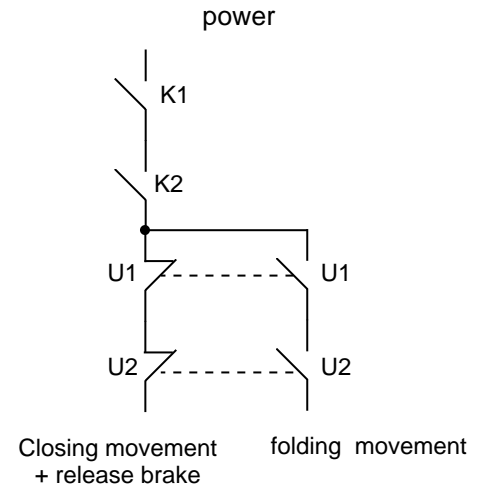
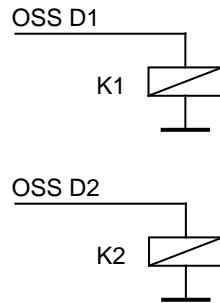
KASt Pulse + 24 V for the selection of the box bending function.

NLW connection to the switch of the overrun traverse cam for executing of the overrun traverse test at: first cycle after voltage reset
 - has to be at + VCC at cycle start
 - + VCC has to be open when the switch is activated by the cam
 - + VCC has to stay open during STOP after the activation of the switch by the cam
 - has to become close by the opening movement
 - has to be at + VCC prior to the new closing movement is enabled.

NA1 - if EMERGENCY-OFF circuit is free, + VCC has to be connected

NA2 - if EMERGENCY-OFF circuit is free, + VCC has to be connected

Connect the reset-normally closed contact in the EDMO-circuit, has to be activated in order to provide the RESET-pulse after the opening and the closing of the 2-channel EMERGENCY-OFF circuit so that the OSSDs can be closed again when the foot pedal is pushed down.



Maintenance The transmitter lenses should be cleaned with a towel or a tissue at least once a month.

The guide rails should be cleaned with a towel or a tissue at least once a month, and they should be lubricated using a tissue soaked with machine oil also at least once a month.

SBMA	item description	order code
	folding machines safety system SBMA, consisting of: transmitter, receiver. Maximum allowable punch difference: 260 mm	SBMA-260

accessories	item description	order code
	safety twin foot pedal, FS2-528ZSD4-U	FS2-528ZSD4-U
	foot pedal for box bending function	AKAS/Ped



Verification of the laser adjustment

The red laser beams must be displayed within the circular marks .

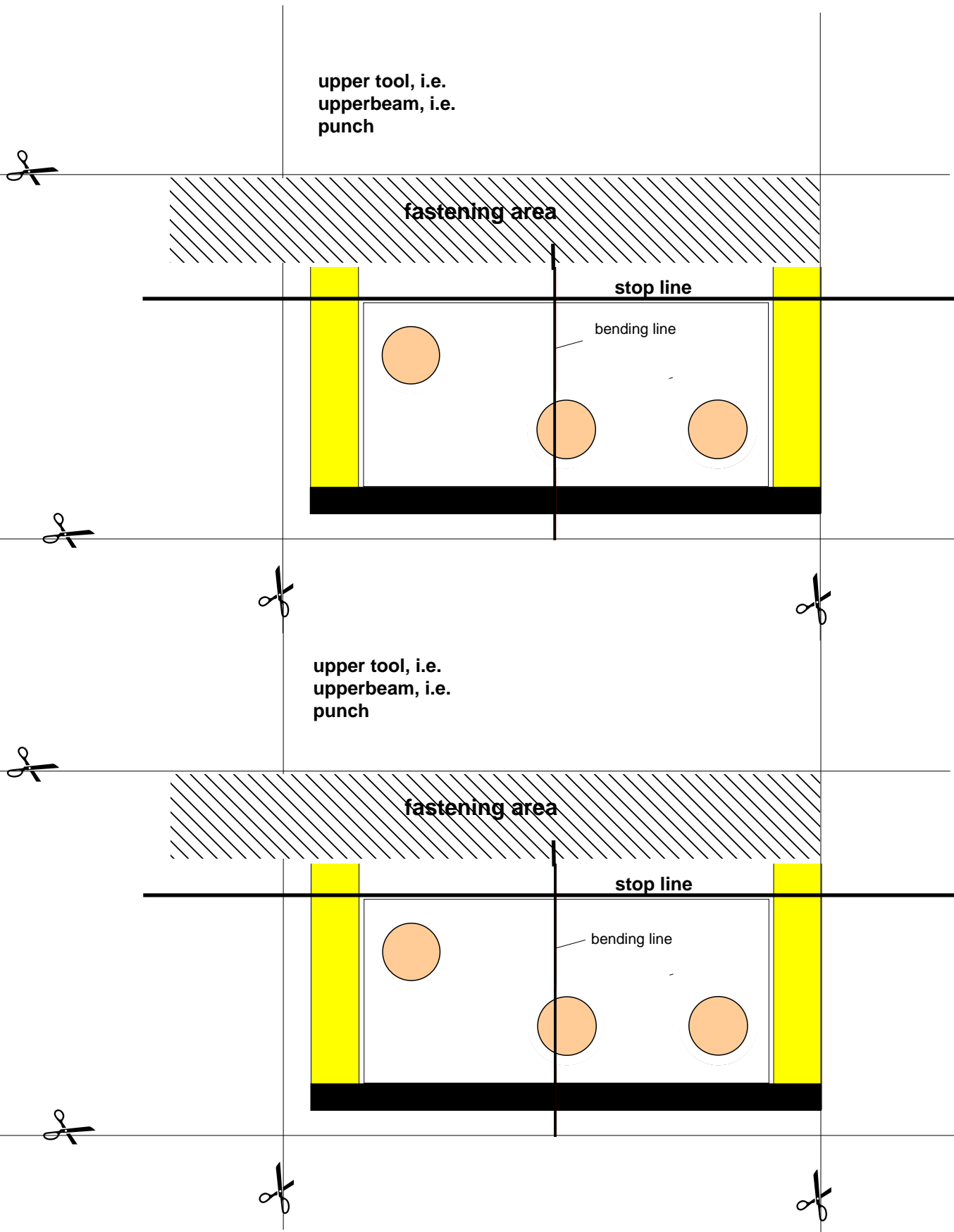
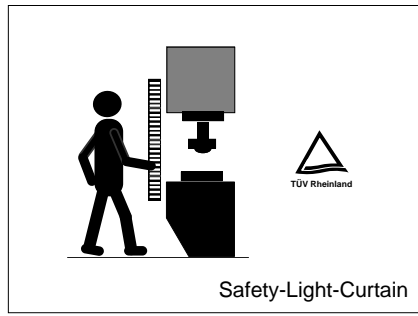


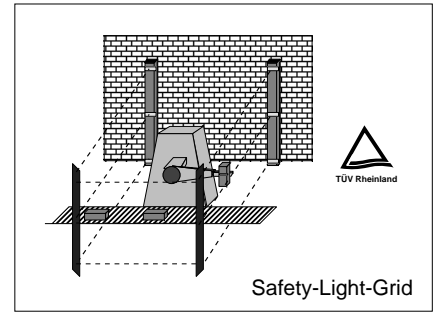
fig. 31/1

Delivery program:

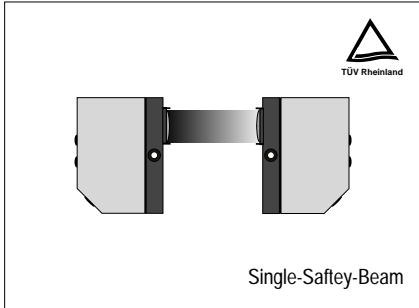
Fiessler Elektronik
 Kastellstr. 9 D-73734 Esslingen
 Telefon: 0711 / 91 96 97-0
 Telefax: 0711 / 91 96 97-50
 WWW.fiessler.de
 E-Mail: info@fiessler.de



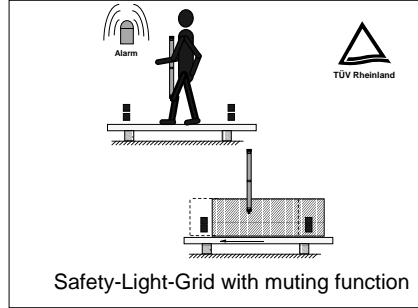
Safety-Light-Curtain



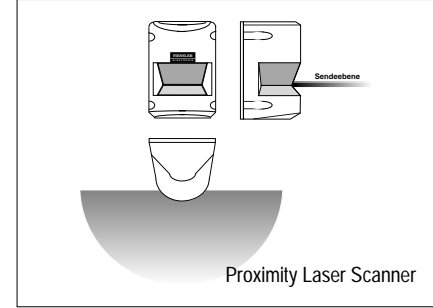
Safety-Light-Grid



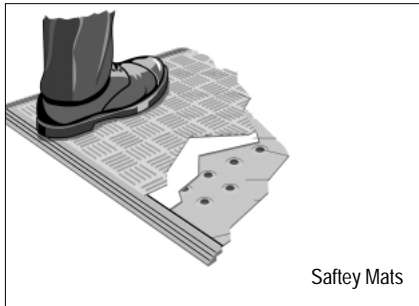
Single-Safety-Beam



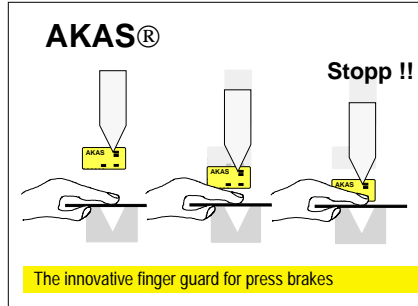
Safety-Light-Grid with muting function



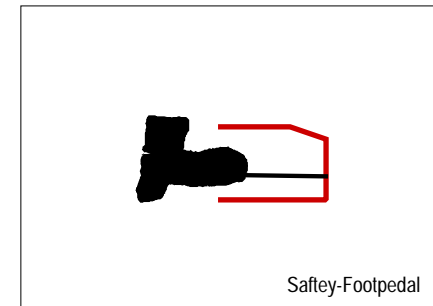
Proximity Laser Scanner



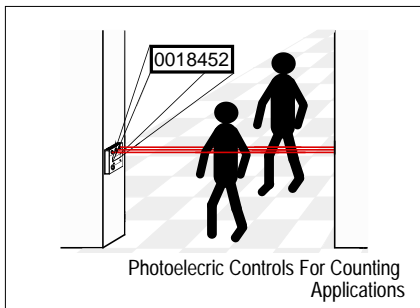
Safety Mats



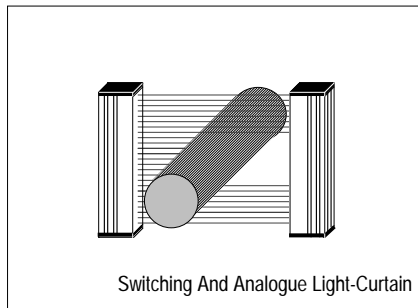
The innovative finger guard for press brakes



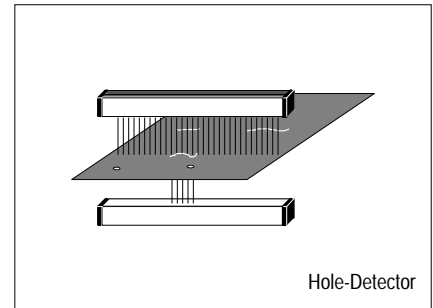
Safety-Footpedal



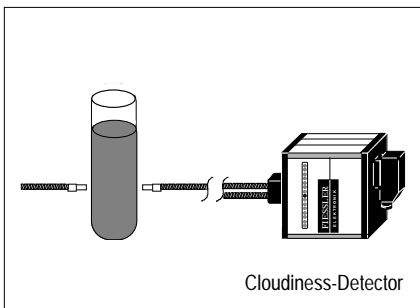
Photoelectric Controls For Counting Applications



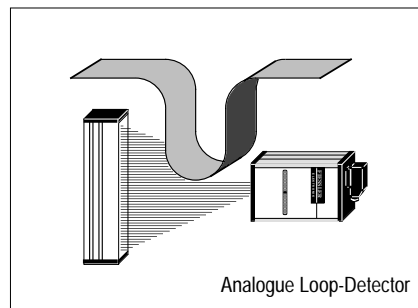
Switching And Analogue Light-Curtain



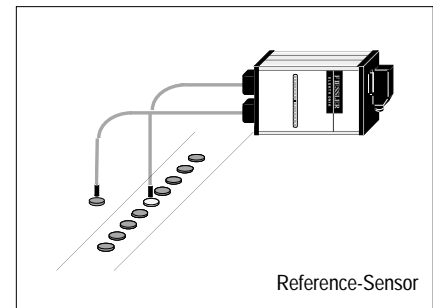
Hole-Detector



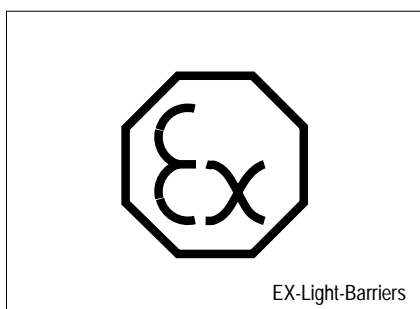
Cloudiness-Detector



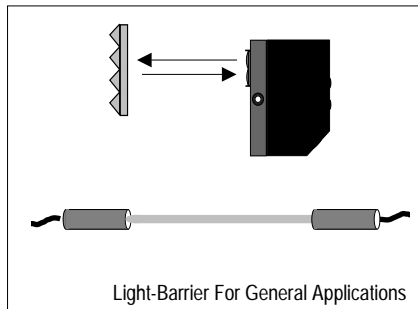
Analogue Loop-Detector



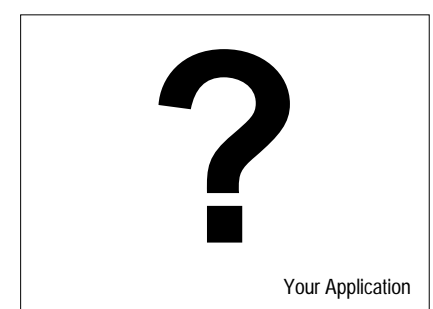
Reference-Sensor



EX-Light-Barrier



Light-Barrier For General Applications



Your Application