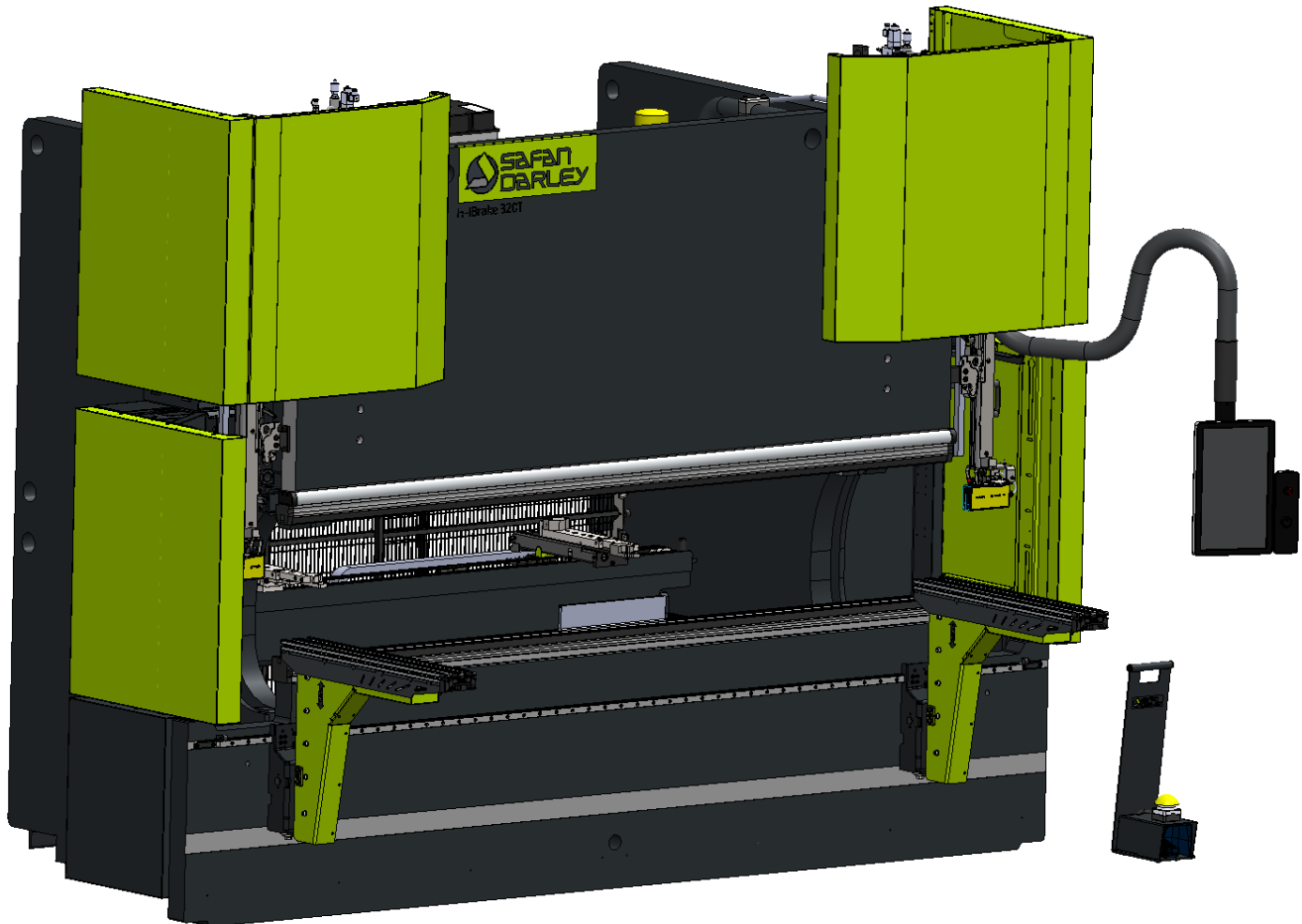


H-iBrake 320-3200



Hydraulic Press Brake

SafanDarley H-iBrake 320-3200

Technologieversion Z24-462-090-A



Instruction manual

M12.3204 2024 EN



H-iBrake 320-3200



1. PRELIMINARIES

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2. INTRODUCTION

The instruction manual is designed to provide the operating and maintenance personnel with instructions concerning the commissioning, operation and maintenance of the machine.

Should you wish further technical information, our service department will be pleased to provide you with this on request. In the event of requests for further information, spare parts and service visits, we ask that you always state the complete machine type and number.

For information, spare parts and service visits, please contact:

SAFANDARLEY EIJSDEN B.V.
Service Department
Eijsden - the Netherlands

T : 0031 - 43 - 409 7409
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Important:

In the event of the commissioning of the machine by our service engineer, we proceed on the assumption that the electrical connection options are present and that an eventual foundation is ready. In the event that the above mentioned instructions should not have been taken into account, it will be necessary for us to charge you with the costs associated with accommodation and the hours spent on site as a direct result of these instructions not having been taken into account.

3. PRODUCT INFORMATION

3.1 GENERAL

3.1.1 Dimensions

Machine length	:	4266	mm
Machine width	:	3046	mm
Machine height	:	3300	mm
Machine weight	:	18000	kg

3.1.2 Technical specifications

Machine number	:	12.3204	
Machine type	:	H-iBrake 320-3200	
Control	:	EC 20 Split Screen	
Safety PLC	:	Sigmatek	
Safety device	:	Laser Akas®LC- 5 M	
Maximum pressing force	:	3200	kN
Motor power	:	15	kW
Number of cylinders	:	2	
Stroke length	:	350	mm
Rate of descent	:	150	mm/sec
Maximum pressing speed	:	10	mm/sec
Rate of return	:	170	mm/sec
Laser guard overrun distance	:	8	mm
Maximum working length	:	3230	mm
Space between the standards	:	2740	mm
Q opening table/p.beam	:	700	mm
Working depth in standards	:	500	mm
Table width	:	100	mm
Table height	:	1025	mm
Tool adaption in press beam	:	Wila NSCL-II HC 3230 Premium	
Tool adaption in table	:	Wila NSCR-II HC 3230 Premium (CRM7)	
Oil tank capacity	:	180 (2x90)	litres
Electrical supply voltage	:	230/400V	3Ph 50Hz
Max. power consumption	:	25	kW
Max. pressure in hydraulic system	:	29	MPa
Acoustic pressure	:	64-72	dBA
Back gauge	:	K XRZ DX	
Plate support	:	Modular support arms	
Angle control	:	---	
Bending aid	:	---	
Bend line projection	:	---	
Adaptive Safety System	:	---	
Smart Light Indicator	:	---	
Robot interface	:	---	

3.1.3 Remarks

1. The hydraulic pump may never be run without oil, otherwise the pump will be irreparably damaged. This is why you should always check the oil level in the tank before starting the motor.
2. In the event of repairwork being carried out on the machine, the machine must be switched off electrically by setting the main switch to "O" and, for reasons of safety, by locking the main switch in this position by means of a padlock.
3. We reserve the right to discontinue our guarantee commitment as soon as it appears that any adjustment, of valves for example, has been changed without our written permission.
4. Connections which have not been made by a properly qualified expert will be at your own risk.

3.1.4 Field of application.



The uses of a press brake are limited to bending and punching sheet materials. For example, metal and plastic sheet materials, mesh materials, etc.
It is not permitted to bend back (flatten) a bent profile.
While bending back, the material to be flattened may tilt which may cause dangerous clamping situations.



Do not use support arms or bending aids as material tables. Place only one product on these attachments.

4. SAFETY

4.1.1 Instructions

- The machine may only be used up to the maximum tonnage and the corresponding maximum width as stated on the type nameplate.
- The machine will always work with a minimum pressure of 5 to 10 tons.
- The machine may only be operated by properly qualified personnel.
- It is forbidden for any one to be present behind, on the work platform with cage ladder or within the machine when it is in operation.
- The machine is only to be operated by one person. When operating the machine by two persons you need an additional operating standard.
- It is forbidden for anyone to be on the machine when it is in operation.
- It is forbidden for anyone to open the electrical cabinet (with the exception of maintenance personnel) (460 V!). The electrical cabinet is to be closed when the machine is in operation. The electrical connection to the machine is to be made by properly qualified personnel and in accordance with the standards which are in force at the time such a connection is made. It is forbidden to hold a naked flame against the machine.
- The operating personnel should wear durable clothing which does not hang loose, as well as industrial shoes with steel toecaps and industrial gloves.
- It must not be possible to operate the machine during maintenance work. The main switch is to be locked in the "OFF" position by means of a padlock.

4.1.2 Provisions

- A protective plate has been fitted over the hydraulic cylinders for the protection of the operating personnel.
- The press has been provided with doors at the sides and the back of the machine in order to provide protection for the operating personnel. These doors are closed by means of a handgrip and are controlled by an electric switch.
- The machine has been provided with an emergency stop.
- The machine has been provided with pictograms.
- Both the operating and the settings switches on the electrical cabinet, can be locked by means of a key.
- The machine has been constructed in accordance with the applicable CE-standards (where these standards are deviated from, this is stated explicitly).

4.1.3 Work safely !

SafanDarley B.V. has made every effort to inform you about any dangers inherent in the use of this machine as accurately and fully as possible. You are responsible for ensuring that you follow this code of conduct.

The purchaser/user is obliged to familiarize all operating, cleaning and maintenance staff with these instructions.

The installation, use, operation and maintenance of the machine are subject to the laws applicable to the field in which the machine is used. Engineers, maintenance technicians, users and operators may only install, use, operate and maintain the machine in a manner which does not conflict with any valid legislation or regulations which have the force of law.

The use of the machine for applications other than those intended and expressly described as well as incorrect and improper use, operation and maintenance may render the full or partial responsibility of the producer or its authorized agent in respect of non-compliance with requirements, damage and accidents null and void.

Protective clothing

Wear the right clothing. Sheet edges can be sharp:



- sturdy work gloves
- boots with steel caps to prevent injury from falling sheets.
- ear protectors

Use of virus scanner

If the machine is part of a computer network, it is strongly advised to use a virus scanner.

During repair work/maintenance (lubrication)

1. Switch off the main supply by means of the main switch at the front of the electrical cabinet; except for connection T1, T2 and T3, the electrical cabinet is now (electrically) dead. The Touch screen is switched off as well.
2. Put away used tools immediately;
3. Shut off the compressed air supply (if present). (Shut the cock in the supply line or set reducing valve at 0 bar.)

The press brake can be equipped with two different control options:

- foot pedal, no laser safety protection
- foot pedal in combination with laser screen safety (AKAS Fiessler)

If foot control (without protection by the laser screen) is used, the closing speed of the upper beam must be less than 10 mm / sec.
If light barrier protection is applied, the closing speed of the upper beam may be more than 10 mm / sec



The activities that fall outside the daily maintenance must be carried out by the SafanDarley service department or by a maintenance engineer trained by SafanDarley.

Restricted application

The use of the press brake is restricted to bending and punching sheet materials (sheet material of for example metal or synthetic materials, wire netting material, etc.).
Do not use the support arms and bend auxiliary as stock table.
Put just one product on these accessories.

Safety parts and instructions

Do not remove instruction plates from the machine
Do not remove parts that were installed for reasons of safety. (Support arms, Safety guards & covers)

Changing tools

Changing tools is to take place from the side or the front of the press brake only.
Switch of the mains power supply by means of the main switch before changing tools.
Tools must be handled in such a way that hands (or part of a hand) never get between the underside of the top tool and the top of the bottom tool.
Tools may not protrude – at both sides - from the tool clamping device. Protruding tools may cause damage or danger of jamming.

Changing print cards or other maintenance in the electrical cabinet

Switch off the main supply by means of the main switch at the front of the electrical cabinet; except for connection T1, T2 and T3, the electrical cabinet is now (electrically) dead.

Pay attention !



A minimum waiting time of 5 minutes must be observed for assembly work on the beam drive amplifiers.

A residual voltage remains on some of the live parts of these amplifiers.

4.1.4 Daily checking procedures

Check the press brake daily:

Upper beam stop time

Safety Laser guard

On loosely vibrated parts,

Whether the HTR function of the foot pedal works,

Leakage (if hydraulics or pneumatics are used).

Stop time

Check the upper bar stop time daily. Operate the foot pedal and then immediately the Emergency Disconnect. Visually check whether the upper beam stops immediately.

HTR function foot pedal

Check the HTR function of the foot pedal is working. Pedal position 3 works as a reset function. Before starting work, make sure there is no mess under the pedal.

Safety parts and instructions

Do not remove instruction plates from the machine.

Do not remove parts of the machine that have been fitted for safety reasons. (side shields, rear shields, shields, etc.) For repairs / maintenance (lubrication).

4.1.5 Explanation of pictograms

All of the pictograms which are used are described below.



*Attention, threat of danger!
Also read the details in this instruction*



Attention, dangerous voltage!



Danger of crushing/amputation!



Danger of crushing/amputation between plate and press beam!



Oil filling opening



Fast movement of the workpiece during bending

4.1.6 Liability

SafanDarley B.V. is not liable for any damage which is incurred, or the consequences of such damage, which arises from incompetent use of the machine.

4.1.7 Correct use of the machine

The SafanDarley H-Brake machine has been constructed in order to bend plate materials.

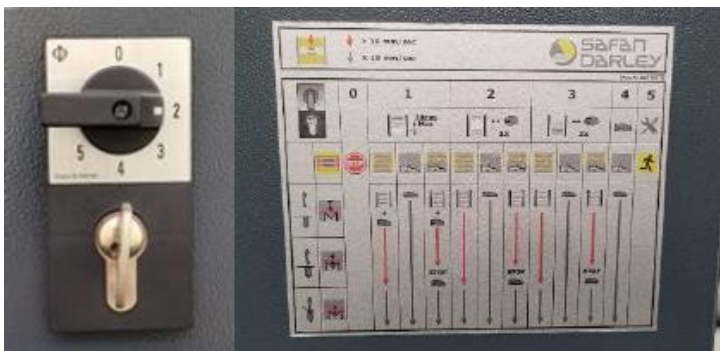
4.1.8 Non-advised use of the machine

The SafanDarley machine is meant to be used as stated in this Chapter
The machine may only be operated by properly qualified and trained personnel.

4.1.9 Risk reduction when changing tools

In case of using tools with different dimensions defined in the machine in the control and press brake program, such as tool height, there will be a risk of unattended collision of tools, with possible damage and injury as a result.

SafanDarley recommends performing a test-run with the press brake after a change of bending program and/or tools. A test-run at safe speed can be performed by selecting operating mode 4 using the 6-mode selector switch on the machine's switch box.



In this mode, the machine runs at safe speed and operation is possible only with the foot pedal. A similar situation can be created by interrupting the active light curtain or laser beam protection during operation. It should be noted, however, that safety in this case is not guaranteed by the safety screen but by operating at a safe speed.

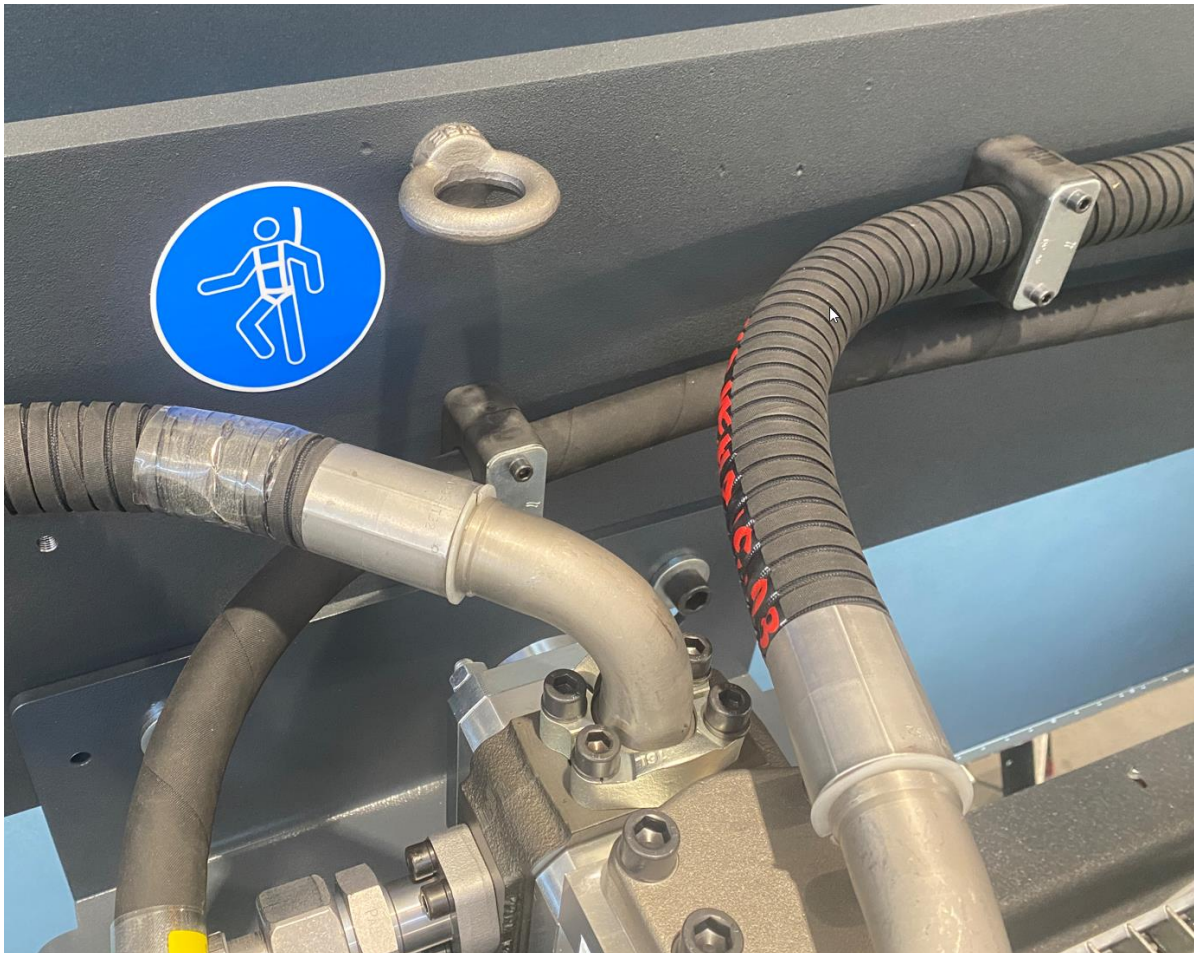
A possible collision can now be recognized by the operator and then prevented by stopping the movement of the upper beam and retracting the movement by pushing through the foot pedal in the third (or lowest) position. After the operator is satisfied that the combination of the press brake program with the parameters stored in the machine control and the tools installed match, then the machine can be started in normal operation.

4.1.10 Anchoring device when working at height

When working on top of the machine platform, it is mandatory to wear a harness (EN 361:2002) and secure oneself in the anchoring device! (see photo)



All fall protection is covered by the NEN-EN 795 standard. This standard for fall protection covers all personal protective equipment against falling. It includes all anchoring devices, requirements and testing.



5. INSTALLATION

5.1 SET UP

5.1.1 Foundation

During bending operations, the machine's construction absorbs the forces which occur. The machine foundation must be sufficiently strong to be able to bear the weight of the press. For the maximum floor loading, see the set up drawing in the appendix 2.

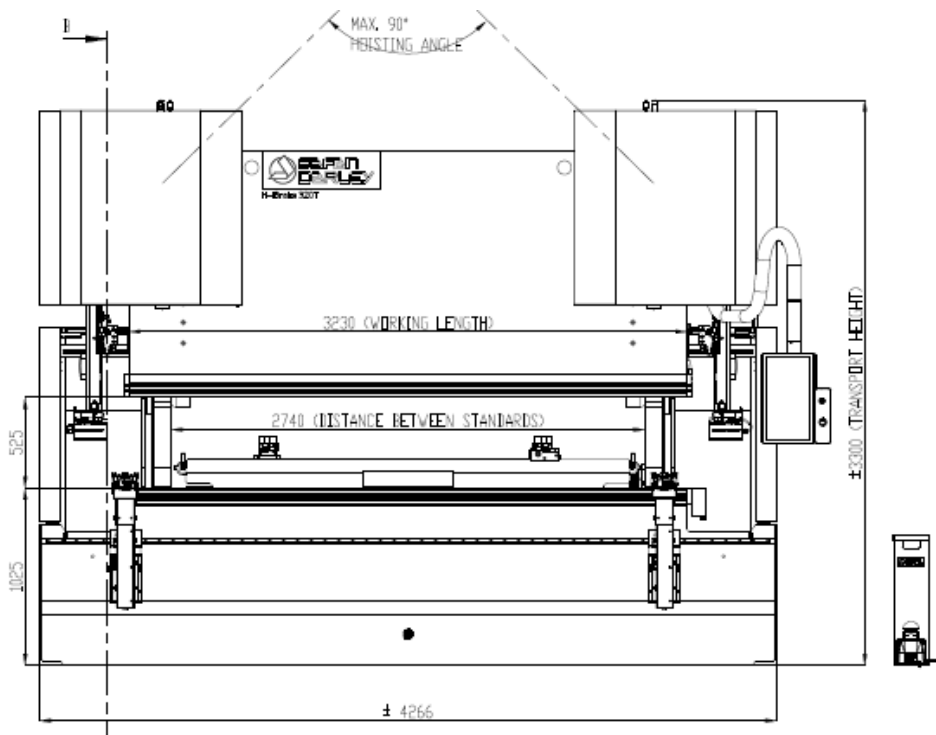
5.1.2 Set up

The customer is responsible for ensuring the unloading of the machine and its transport to the set up location. The machine must be levelled both lengthwise and crosswise. Adjustment facilities are present in the feet of the standards.

The following deviations are permitted:

- crosswise: about 0.1 mm/m (machine depth)
- lengthwise: about 0.2 mm/m (machine width)

The anchor bolts are included as part of the machine's standard delivery package.
The hoisting chains or cables may never form an angle larger than 90°!



See appendix 2 for important dimensions. Also positions of the hoisting points are indicated, whereby the righthand point lies exactly in the machine's centre of gravity. The machine load per supporting point is also indicated on this drawing.

5.1.3 Operational area

The front of the machine is laid out as the operational side of the machine. This is where the actual work is carried out, such as the manipulating of the sheet which is to be bent. Accordingly, this area of the machine is only meant to be used by the machine operator.

Covers are fitted to the sides of the machine, which must be able to be opened during the changing of tools. The changing of large tools will have to be carried out with the assistance of a crane. In addition, there must be sufficient space at the sides of the machine for pulling out long tools. The minimum space which must be available for this purpose is the width of the machine, and this space must also be accessible for the crane. It is not allowed to loosen the bolts of the clamping plates more than $\frac{3}{4}$ turn. Never place your hands under the tooling while exchanging.



Under no circumstances should you keep your hands under the tools when replacing the tools.

By opening the door at the back, you can make adjustments to the machine's back gauge. This space behind the machine is only to be used for making such adjustments to the back gauge and it is **absolutely forbidden for anyone to be present in this area when the machine is in operation**. The door is protected by means of the electric switch.

5.1.4 Ambient conditions

A precondition for achieving the accuracy and the good performance of the machine is that the customer guarantees the following basic conditions of the environmental conditions according to EN-50178 with classification 3K2:

- Closed hall without air currents and an ambient temperature of 10°C to 30°C
- Maximum permissible change in the hall temperature within 24 hours of $\pm 2^\circ\text{C}$
- Temperature gradient in the hall: $\leq 2^\circ\text{C}$ at 5mtr height
- The foundation of the machine must be isolated against temperature influences
- The foundation of the machine must be isolated against vibrations in the environment
- Electric main connection cable up to the specified connection position
- Air supply up to the prescribed connection position.
- The quality of the compressed air must comply with the ISO 8573.1 class 3.4.4 norm
- Rate humidity for EC control and E-cabinet: 5% -85% (non-condensing)
- In operation height with regard to sea level: <1000 meters
- Maximum shock in operation: 65G @ 2ms
- Maximum shock out of operation: 300G @ 2ms
- In operation vibrations / vibration 20-300HZ, 0.75G (0 to peak)

Conditions that do not comply with the aforementioned basic conditions can affect the accuracy, the good performance and the power and also affect the life of the motors and controls of the machine.

At a relative humidity above 85%

All SafanDarley E-Controls must be placed in a non-condensing environment!

Additional changes when placing machine within 500m of the sea

The machine must be equipped with a sea level coating (salt air damaged the motors and air conditioners) Extra price upon request, when the full machine specification is known.



H-iBrake 320-3200



Additional changes when placing machine at height levels

For every 500m of operation height, the power of the motor will decrease by 3%.
At an extreme altitude a motor with more power will be installed. Extra price on request, when the complete machine specification is known.

5.2 CONNECTION

5.2.1 Hydraulic (Appendix 3)

Check that the system has not been damaged or that components have become loosened either during transport or during erection of the machine. Check the oil level and top-up if necessary. (see Appendix B2). The machine's oil reservoir is to be found in the cross-beam. The orange-coloured dipstick with de-aeration and the filler cap are to be found on top of the tank cover.

5.2.2 Electrical installation

The machine's electrical installation is ready for use. Only the supply voltage has to be connected to the location at which the machine has been positioned. In this respect, the cross-section of the connection cable must be adjusted to suit the total power required. The earth lead must be connected to the earth terminal. Should the motor rotate in the wrong direction, then two poles must be changed over. **An arrow on the motor indicates the correct direction of rotation.**

Remark: **The hydraulic pump may never be run in the wrong direction of rotation. This will lead to immediate damage.**

Power supply connection on a Clockwise Rotary Field.
(Remark: To be measured with a 3-wire Phase Rotation Indicator)

Rotation can be checked with the movement direction of the crowning motor or the rotation direction of the hydraulic pumps.

5.2.3 Electrical mains connection

The electrical mains connection must be equal to the machine's electrical connection value (see the small indicator plate on the machine).

The direction of rotation can be simply checked by pressing the "Start" button, immediately followed by pressing the "Stop" button. This results in the motor running briefly, which enables the direction of rotation to be determined.

Remark: **Electrical connections are to be made by properly qualified personnel and in accordance with the applicable statutory standards.**

5.2.4 Portable foot operating standards

The two foot operating standards are connected to the electrical cabinet.

5.3 OPERATION

5.3.1 General




After the machine is electrically connected and the rotation of the motor and the oil level is checked, then the machine can be put into operation. The machine must be operated by trained personnel in accordance with the safety regulations (Section 2.2).

5.3.2 Starting the press brake



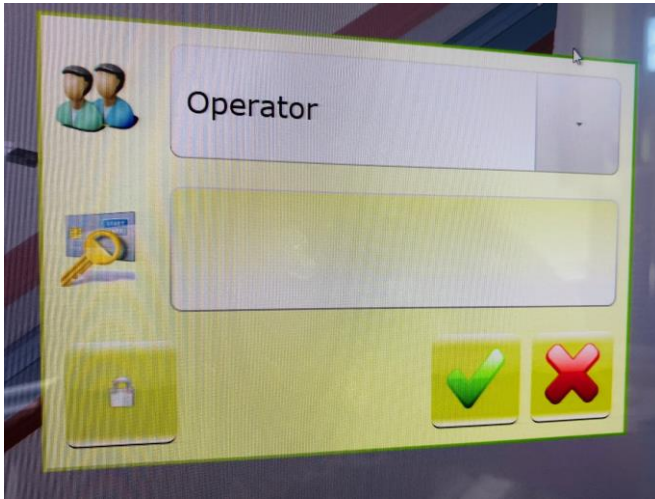
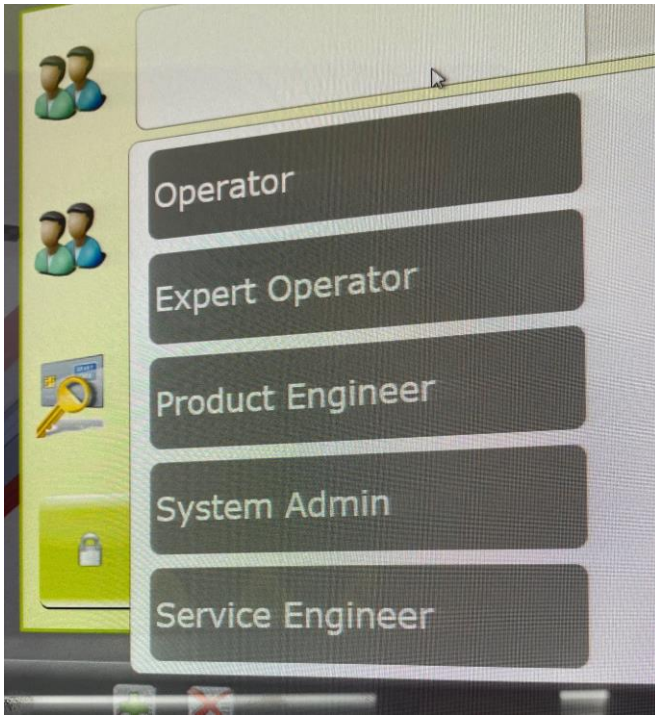
At start-up of the press brake, the safety and operating conditions of the used type H-Brake are known to the operator.

1. Set the selector switch on the back side of the e-cabinet to position 1. (or higher but not in Service position 5) See sticker on the right side of E-cabinet for the functions of each position.

		↓ > 10 mm/sec		↓ ≤ 10 mm/sec		SAFAN DARLEY	
		0	1	2	3	4	5
							
							
							



2. Turn the power on with the main switch on the E-cabinet.
3. E-Control will start. The program will check for updates and install the available updates when there is internet connection. E-Control will now display the login screen.
4. Choose your log-in function / name and tap your log-in code. Listed below is an overview of the standard login codes.



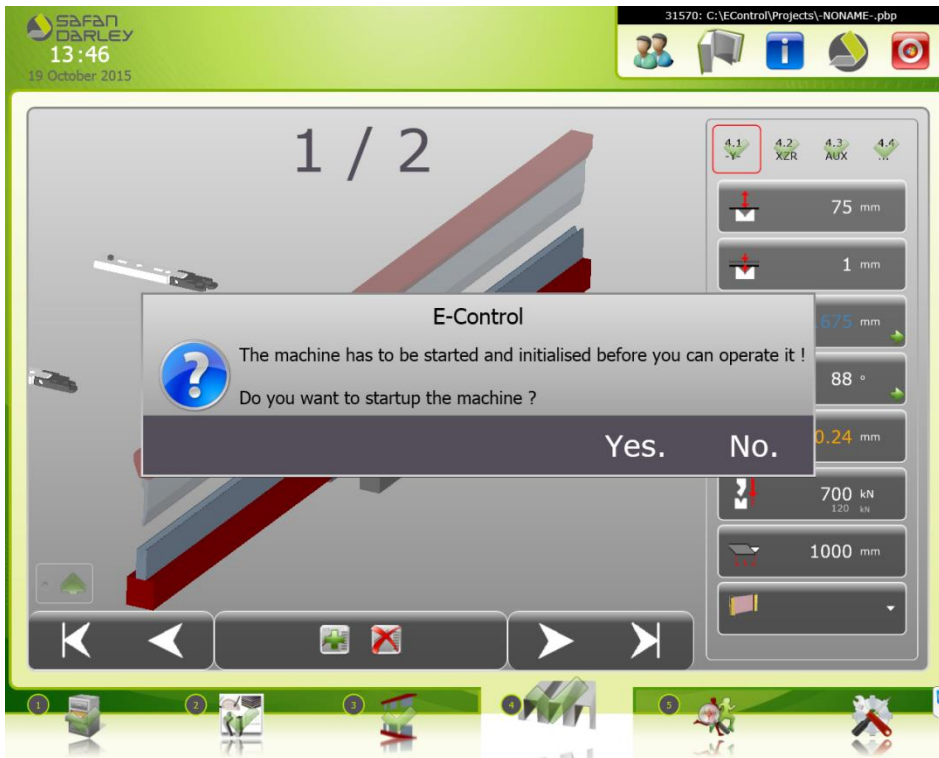
#code#

Operator	123
Expert Operator	246
Product Engineer	357
System Admin	167

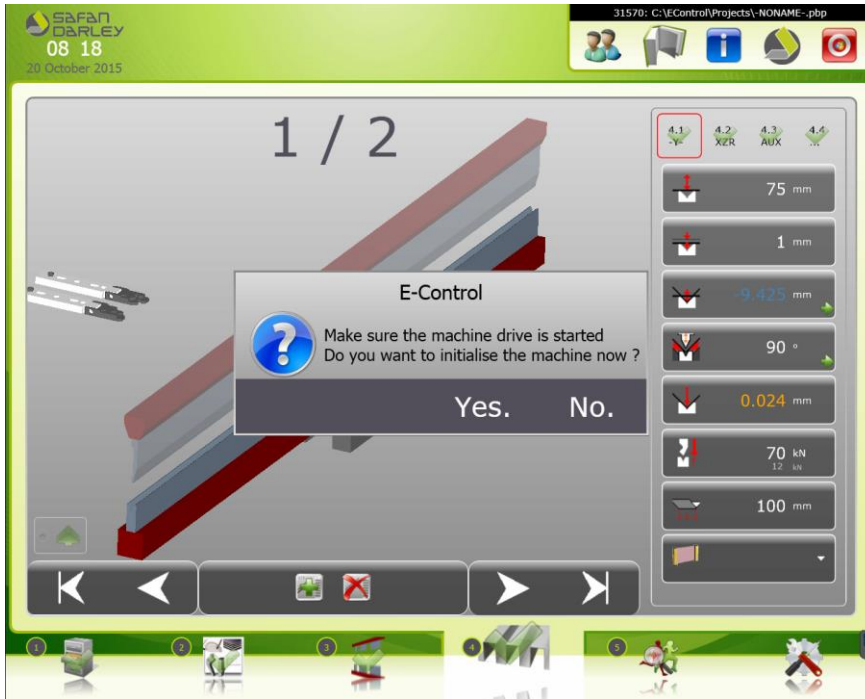
5. E-Control will start up the last used project.
6. When making a Test bend or when starting in RUN mode, you will be asked to start the drive and to initialize the machine.
7. Push the RESET button on the control panel.



8. Push the DRIVE-ON button on the control panel.



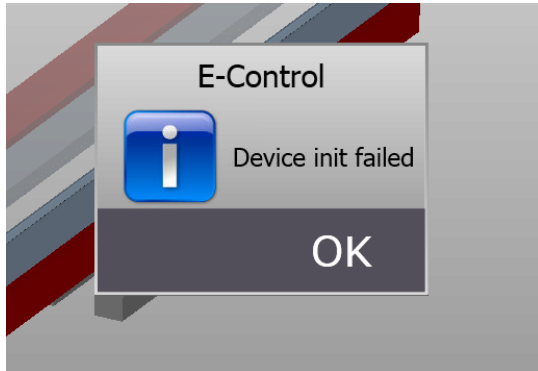
9. Tap "Yes" . Wait for the next question.



10. Tap "Yes". The machine will now start it's initialization process.



If you did not push the RESET and DRIVE-ON buttons or initialization failed, E-control shows the following message:



Tap "ok"

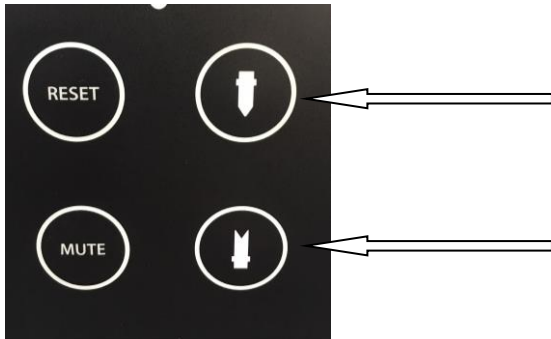
E-control repeats de start procedure.
Make sure that you push the buttons on time!

11. E-control and press brake are now ready for production

If the press brake has a hydraulic tool clamping device, you will see following message on the screen. It appears when RUN MODE is activated.



12. Push TOOL CLAMPING button(s) on the control panel.



E-Control and the press brake are ready for production now.

5.3.3 Resetting Y-axis (when the machine is running)

Procedure to reset Y-axis when ERROR_Y_AXIS_TILT (skew) or ERROR_MAX_STROKE_REACHED (deep-fire stop) are reported

* Follow the following steps when the machine is running / on

1. Set the selector switch on the machine to service mode 5



(right side of the E-cabinet)

2. Press the RESET button on the controller and hold it.



Reset Button Controller

The hydraulic system starts and the press beam moves upwards.
Keep pressing until the press beam is in its top position.

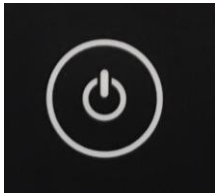
When the press beam is above:

1. Release the button. The hydraulic system stops.
2. Set the selector switch back to the desired operating mode 1,2,3 or 4 (see machine sticker)

Press the RESET button on the controller



Press the DRIVE-ON button on the controller



The press brake is now ready for production!

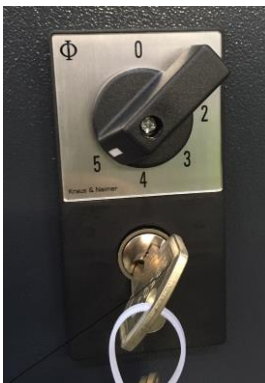
* If the machine is switched off after the tilt (TILT) or emergency stop button (ERROR_MAX_STROKE_REACHED) is active, the initialization will not work. The Y-axis must first be set to GERESSET after the machine has started and before the initialization. The press beam may be misaligned or in the lowest position on the depth of emergency stop. Then follow the instructions on the next page.

5.3.4 Y-axis reset (when the machine is switched off)



When starting a press brake, the safety instructions and the operating instructions of the relevant press brake must be known to the operator.

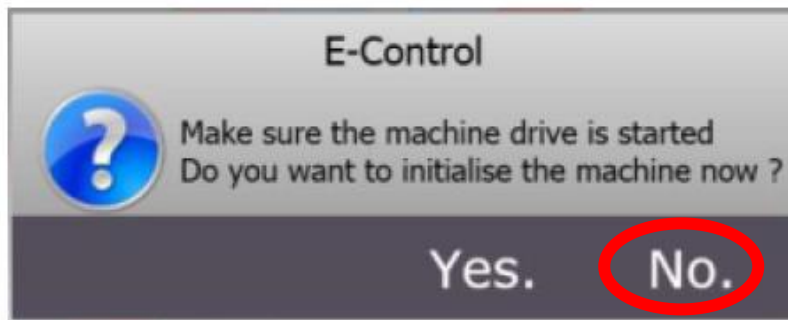
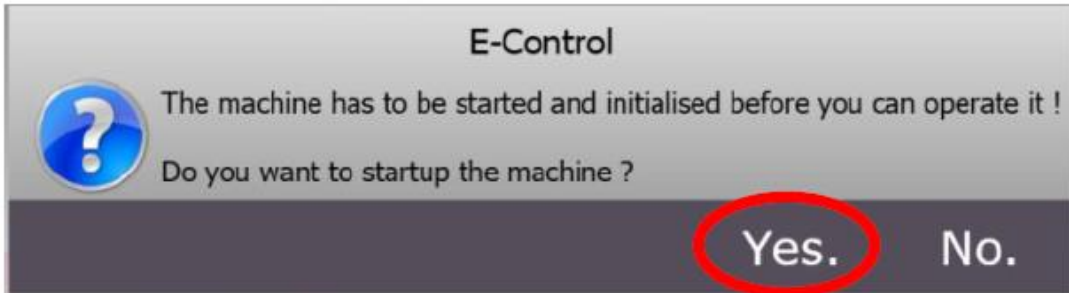
1. Set the selector switch on the machine to service mode 5



(right side of the E-cabinet)

2. Switch on the main voltage of the press with the main switch on the E-box.
3. E-Control is started. Every time E-Control is started, the program checks for updates and installs them if there is a network connection.
4. E-Control now shows the login screen. Enter your login function / name and enter your login code
5. E-Control starts with the last used project
6. To make a test bending or when bending is started, you will be asked to start the drive (first question) and to initialize it (second question)

Answer **yes** to the first question and **no** to the second question!



7. Press the RESET button on the the E-box and hold it.



Reset button Controller

The hydraulic drive starts and the press beam moves upwards.

Keep pressing until the press beam is at the top.

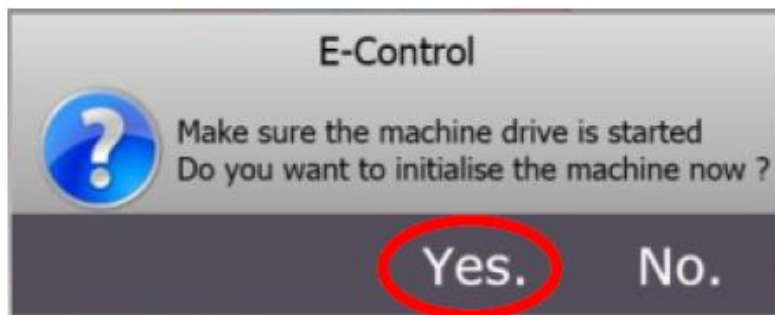
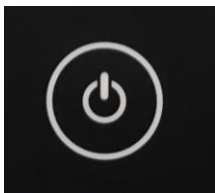
When the press beam is above:

1. Release the button. The hydraulic drive stops.
2. Set the selector switch back to the desired operating mode 1,2,3 or 4 (see machine sticker right side E-cabinet)

Press the RESET button on the controller



Press the DRIVE-ON button on the controller



Now answer "yes" to initialize the machine.


If the question does not appear on the screen, try a TESTBEND or go to RUNSCREEN.

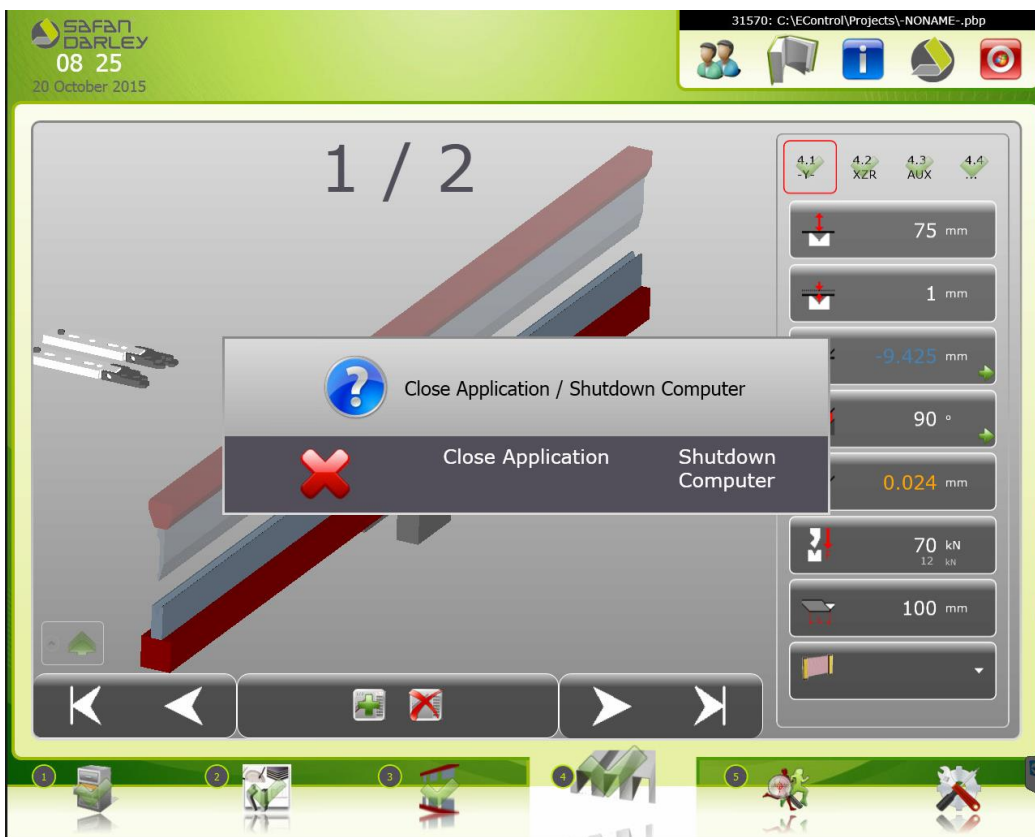
After a successful initialization, the machine is ready for use!

5.3.5 Stopping the press brake



When a hydraulic press brake is not used for some time, the upper beam must be placed in the lowest position. This is the responsibility of the operator.

1. After the last production activity, tap TAB 4.
2. Tap the  button in the upper right corner. The screen below will be displayed.



3. Tap "Shut down Computer".
4. Wait until Windows has been shut down.
5. Turn off the main power switch.
6. Clean the machine and the surroundings.

Note:

The emergency stop is located on the control panel and a panic switch is installed in the foot pedal. This switch will be activated by pushing through the foot pedal. The pressing beam now returns to the programmed starting point (PSP) and with a second time pushing through the pedal, the pressing beam returns to the upper point.

When the emergency stop on the control panel is actuated, the control current is switched off and the system stops. The emergency switches must always be unlocked before the drive and the control unit can be reset/restarted.



When the emergency stop is operated, the built-in safeguard for preventing excessive tilt will no longer be active. Action: after emergency stop operation, unlock the emergency stop as soon as possible, reset the emergency stop and then actuate the drive-on button so that you can place the press beam in its uppermost position again. This is again the responsibility of the operator!

5.3.6 Speed security press beam/back gauge

When one of side doors is opened, the press beam and back gauge will go to slow speed. When both side doors and/or the back side slide door are opened the main hydraulic unit will stop.

5.4 PC configuration

5.4.1 PC description

Chassis	Mini-ITX embedded chassis, black.
Power supply	ACE-A627A 270W power supply.
Main board	Mini-ITX, HDMI 2.0/HDMI+DP/VGA Dual Intel GbE SATA 6Gb/s, USB 3.0, PCIe Mini, HD audio and RoHS VGA port 2 DP-VGA-R10 DisplayPort to VGA converter
Processor	Intel Core i5-6500 (6M Cache, up to 3.60 GHz) 6th Generation
Memory	8GB DDR4 RAM (2 x 4GB)
Storage	64 GB industrial SSD 2.5" SATA MLC
I/O	3 x RS232 port, 1 x PS/2 port, 2 x LAN, 2 x USB 2.0, 4 x USB 3.0
Software	Windows 10 IoT Enterprise LTSC
USB Key	64Gb USB 3.2 key + image

The HDMI connections are not used
Version as at November 2021

Operating system

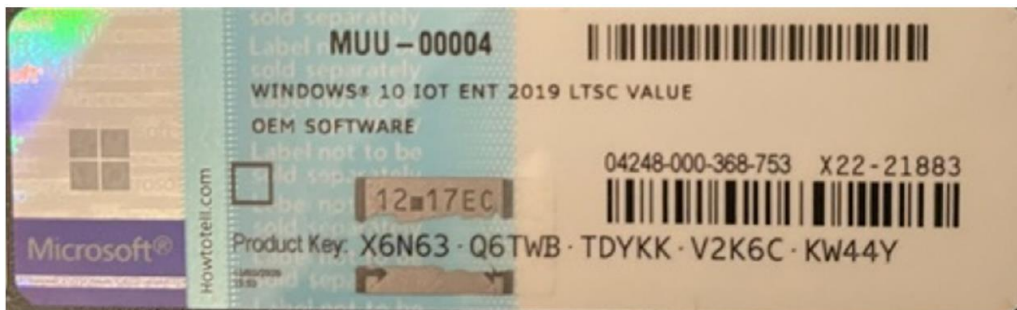
Windows 10 IoT Enterprise LTSC 64bit
Dongle hardware: USB dongle.

Software

The E-Control software supplied is E-Control version 1.2.1.2 or higher

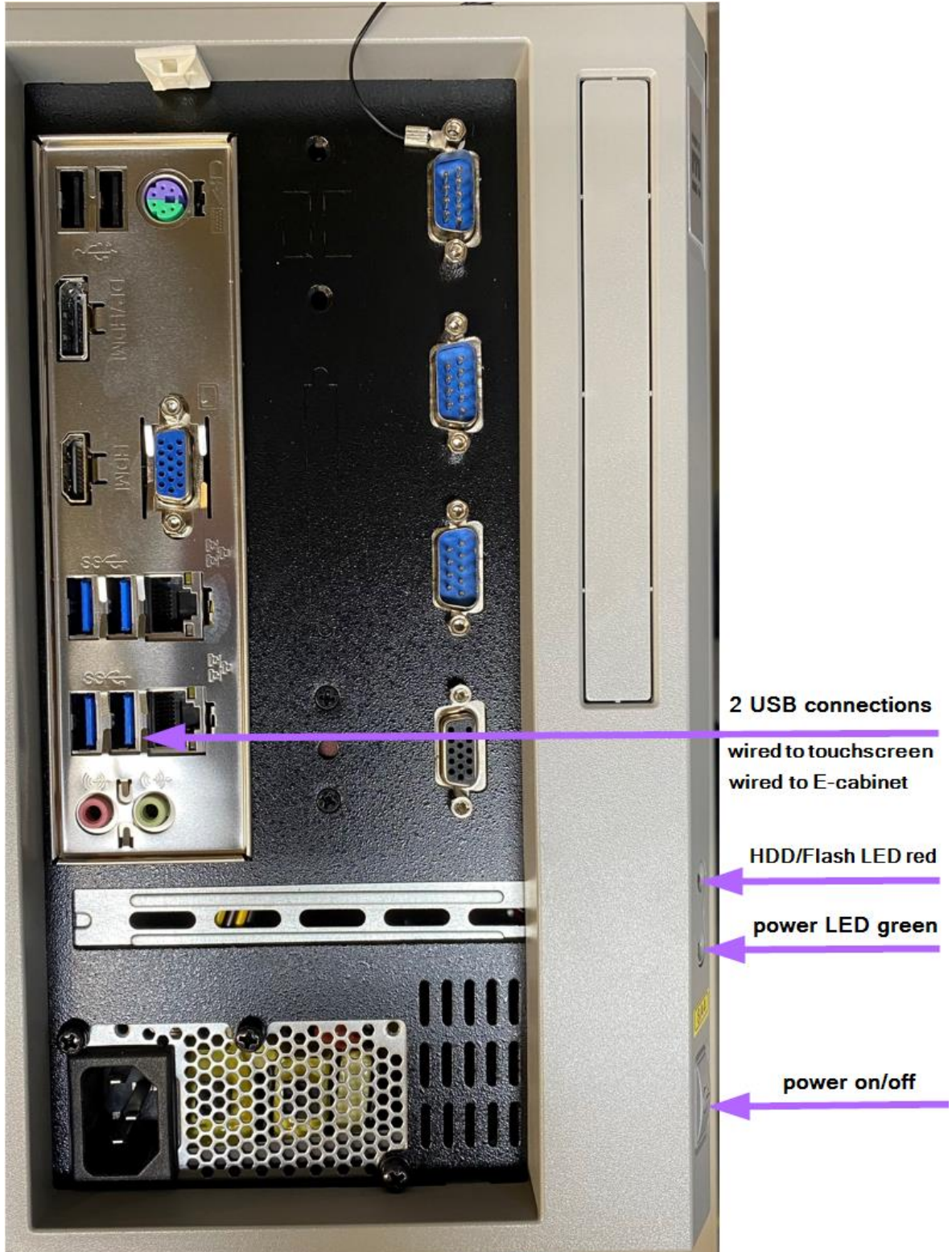
Windows software license

A unique license sticker is attached to each PC casing.



License sticker

Figure , Overview PC with wired Image Back-up USB



5.4.2 Working of the PC

The PC is based on a mobile processor, which is a CPU designed to save power.

The PC can be switched off directly from the application.

Because of its low energy use, the PC takes longer to become totally de-energized. Consequently, you should wait a bit longer before switching the power back on.

If you do not allow the PC enough time, it may not automatically start up again. Wait therefore at least 30 sec. before switching the power back on.

The PC will then automatically start up again; you do not need to push the start button on the PC. Under normal circumstances, this button does not need to be used.

Auxiliary equipment

To load the software and make back-ups, auxiliary equipment is required such as memory sticks and USB drives.



No memory sticks should be in the IPC while starting up the machine or the IPC.

5.4.3 Image back-up and restore system.

When using a PC system, situations can arise that damage the memory system (HDD or SSD). For that reason this PC is equipped with a wire fixed image back-up USB-stick. With this system the PC can be brought back to a previous good working situation. (at least the situation of commissioning of the machine)



All settings files, parameter files, application files and production files get lost while making an image restore.

Keep in mind that an image restore does not recover the application files and production files.
So backup you production files daily.

Files relating to the SafanDarley application can usually be repaired quickly, Parameter and setting files have been saved on the USB-stick that comes with the manual. (On the stick data and settings as per the time of commissioning of the machine).

Attention:

Ensure that the backup image remains with the PC, this is the only copy and cannot be backordered.

On this memory key there is a sticker with the unique number of the IPC and belongs to this IPC in connection with the licensing system of Windows. This also requires that the existing backup image should not be used in any other IPC.

Shut down

The IPC should be shut down in the proper way otherwise E-Control might not start up at a restart.

Use of virus scanner and updates

If the machine is part of a computer network, it is strongly advised to use a virus scanner and NOT to update MS Windows software.

Third party applications

It is permissible to expand the PC of this machine with software for virus checking and backup software.

Because there are so many programs in this area, SafanDarley cannot exclude that any of these programs have a negative impact on the operation of the machine.

The PC can be slow, the PC can respond less quickly to touch / key strokes and the speed of the refresh may decline.

Should there after installation of this software – also in the longer term - "foreign interference" occur, the SafanDarley service technician might remove this software to be able to separate the problem area.

5.4.4 Cybersecurity!

Consider linking the machine to a local and/or public network including the Internet. In addition to the opportunities created by these developments, new threats also arise. Consider, for example, malicious persons who can hack into computers and computer networks from distance and thereby disrupt or shut down processes..



It is therefore the customer's responsibility to secure the local and/or public network with cyber security!

With that, cybersecurity is also a big factor in terms of work safety. Implementing cybersecurity on the local and/or public network is therefore very important.

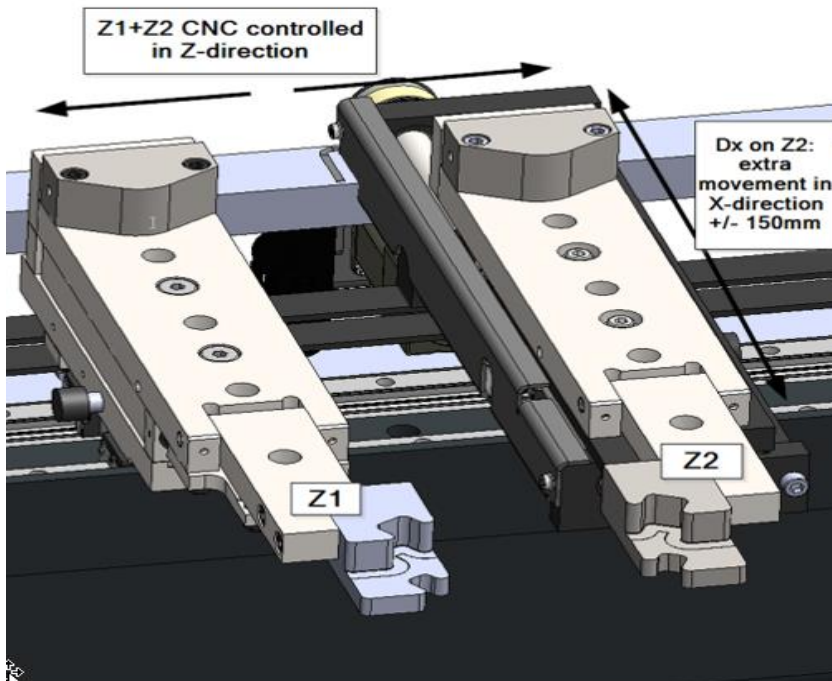
5.5 BACKGAUGE K XRZ DX

5.5.1 General

The HD (heavy duty) backgauge, type K XRZ DX consists of 5 independently controlled axis, driven by AC servo motors. The AC drives are located in the electrical cabinet on the righthand side of the machine. All axis are equipped with hardened precision guidings, while rack- spurs and precision ballscrews are used for the linear movements. By option, two 3D fingerstops type H are mounted. (Z1+Z2 CNC adjusted in Z-direction) The righthand fingerstop Z2 is equipped with an axis for extra movement in the X-direction (DX).

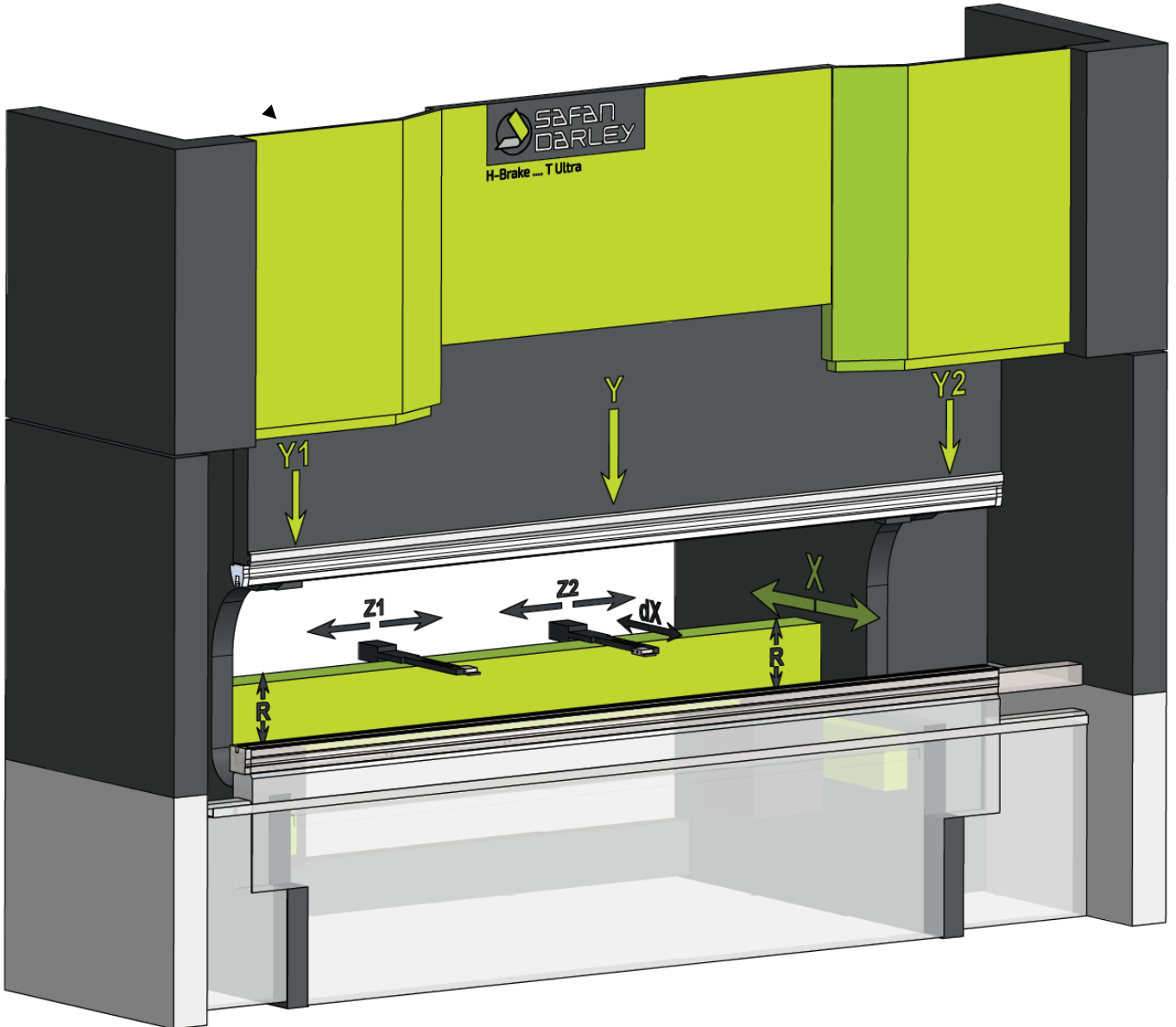
5.5.2 Technical specifications

X-axis range	:	800 mm(2nd support point 840, 3th support point 1300 mm)
DX-axis range	:	+150/-150mm
R-axis range	:	+120/-80mm
Z-axis range	:	Between the standards
Accuracy	:	$\pm 0,1$ mm
Fitted as option	:	2x 3D-fingerstops (Z1+Z2) CNC adjusted, Delta X (DX) on Z2



5.5.3 The programmable axes of the machine

The following figure shows clearly where all the programmable axes of the machine are located.

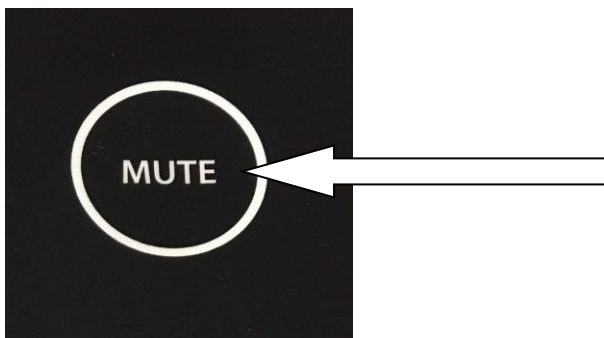


5.5.1 Back gauge operation

After the machine has been started, the back gauge will move to the rearmost position in order to find the reference value.

The back gauge axes (X, R and Z) can be moved rapidly or slowly in a positive or negative direction by means of the control. For more information concerning this subject, refer to the controller instruction manual.

If an R-, X-, or Z-axis value is programmed, the back gauge will move automatically to the desired position after the "start" push-button of the controller has been operated.



Attention!

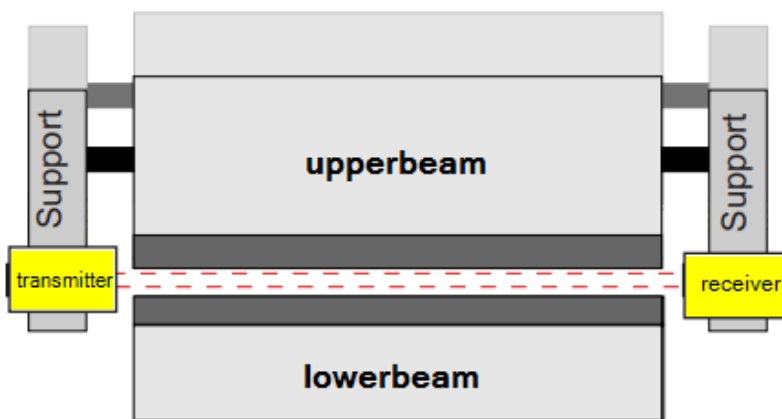
Ensure that the finger stops are always set at the correct height, so that they cannot come into contact with the die. The finger stops may not, under any circumstances, be moved manually from front of the machine between the press beam and the die. This should always be done from the back of the machine!

Open the sliding door at the back of the machine, move the finger stops, and close the door, press the "RESET" and the "DRIVE ON" button, the machine is now operational again.

5.6 Laser Guarding Safety Fiessler AKAS®LC-5 M

5.6.1 Introduction

The Press brake Laser Guarding System AKAS®LC-5 M is a special protective device. It consists of a transmitter and receiver which are mounted on the side of the upper beam. The transmitter and receiver form a Laser-optical safety light grid which is located in front and directly under the bending punch. Also see the illustration below.



Before a part of the body is squeezed between the upper and lower tool, the part of the body interrupts at least one light beam. By this means the movement of the upper beam is stopped, before it comes to an injury.

With the Laser-optical safety light guard AKAS®-, the hands remain free for handling the product close to the die during the whole bending process with still continuous protection.

Depending on the machine stopping distance, the upper beam can be operated at high speed until the punch meets the sheet metal to be bend.

5.6.2 AKAS 3PM Hardware

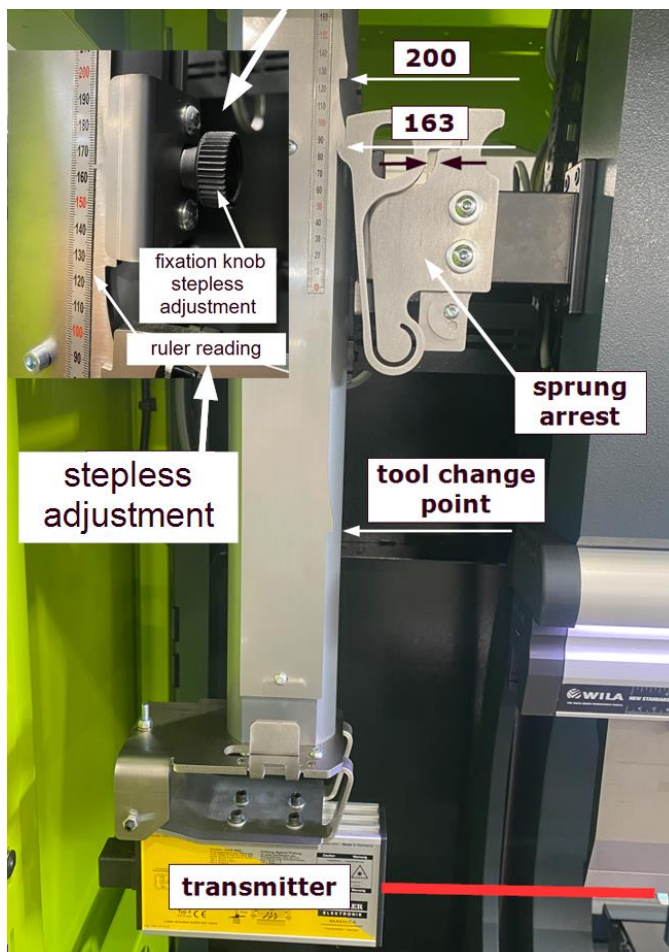
The Finessler AKAS®LC-5 M system on SafanDarley machines always consists of a laser beam transmitter on the left and a receiver on the right side of the upper beam. The transmitter and receiver are manually adjustable to change the working height when using punches with different heights. Before adjusting the punch height or place the transmitter/receiver at the tool change point always loosen the **guide fixation knob** and when finished lock the guide again using this knob.

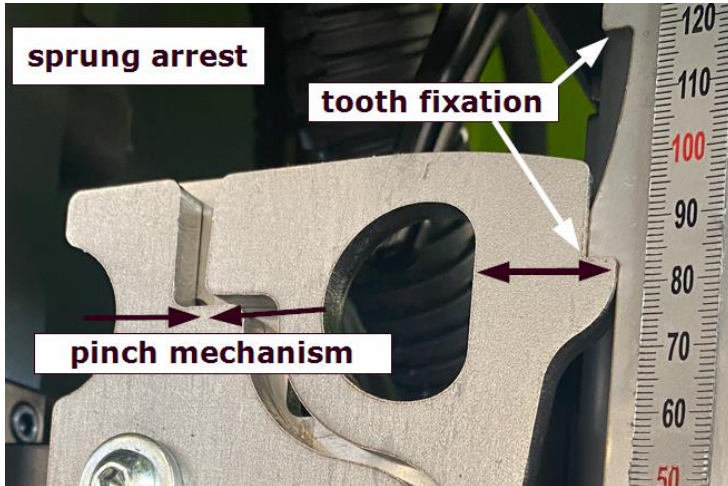
The punch height can be adjusted via a **sprung arrest** with **ruler reading** and **pinch mechanism**. (see illustration) The punch heights 163 and 200 are fixed by means of **tooth fixation**. Also you can adjust the tool height **stepless** with the **fixation knob** with ruler reading.

The transmitter and receiver are mounted on an aluminum construction and can be lifted and locked in place using the **handle bar** on the side of the aluminum tube.

Attention: When making height adjustments, use only the aid of the handle bar on the side of the aluminum tube and not by supporting your hand under the transmitter or receiver!

When placing the device in the **tool change point**, the long punches can be extend and retracted in the upper clamp. Then disconnect the sprung arrest and lower it to the correct punch height using the **handle bar** as support.





*** Note: Open the side door to adjust the transmitter or receiver!**

The transmitter projects 2 laser beams under and in front of the stamp on the receiver. The receiver has several sensors to detect interruptions.

The E-control of the SafanDarley machine processes the (safety) signals to the AKAS system.

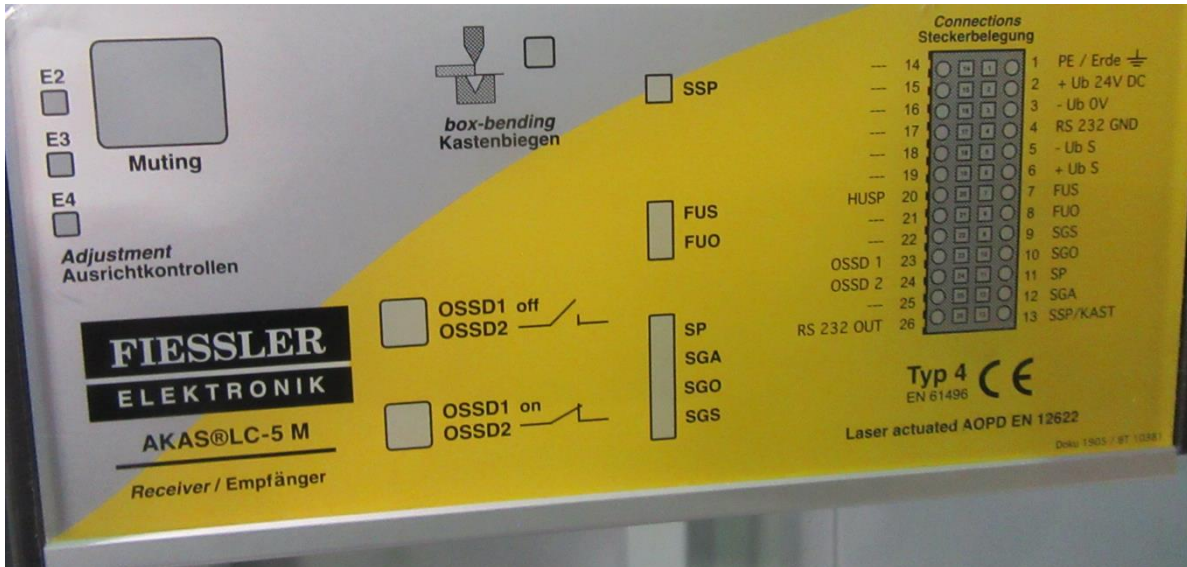


Transmitter



Receiver

5.6.3 AKAS®LC-5 M Signals on the Receiver



If the muting light flashes, the Akas system is ready for use.

If box bending is selected, the "Box bending" indicator light lights up.

5.6.4 Initial Stop test

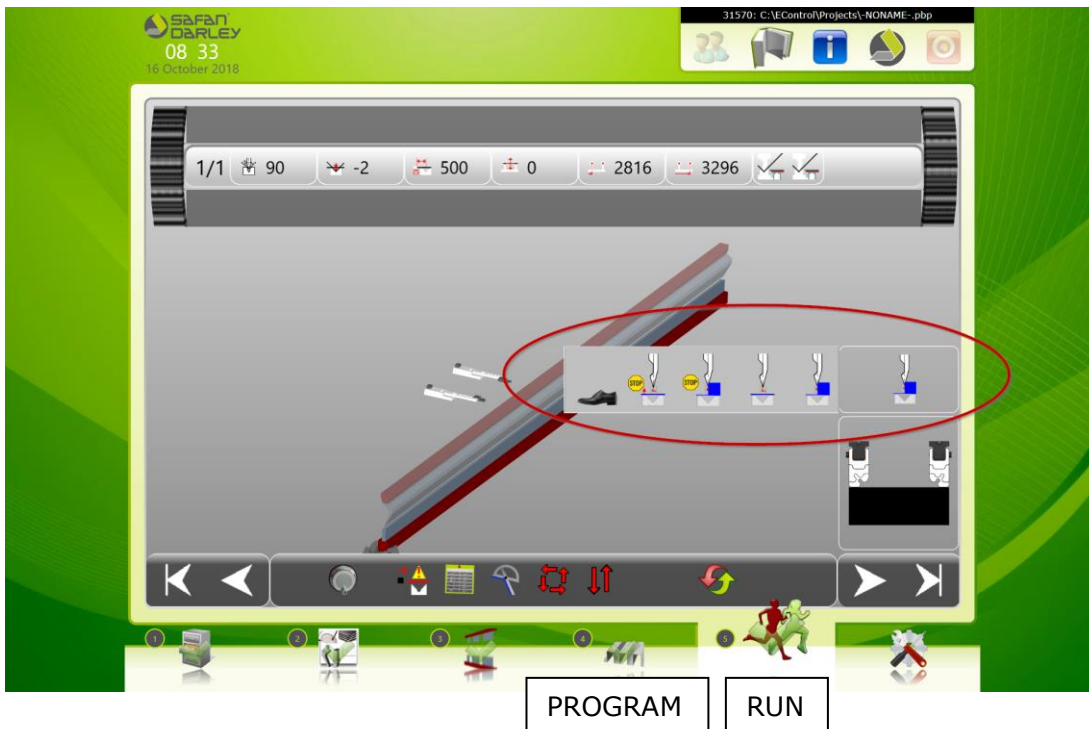
An initial stop test is required after starting up the press brake or after 30-hours have elapsed. During the first y-axis high speed down movement from MSP, the controller will automatically trigger the stop test by stopping the upper beam and measure the stop distance and time. A message similar to "Y-axis stoptest is active" will shortly be displayed in a message box in top of E-Control.

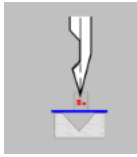


After the stop test is finished, the message will automatically disappear and the press brake is ready for operation. In the background, every single high speed upper beam stop will be checked for stop time and stop distance.

5.6.5 Programming Laser Guarding modes

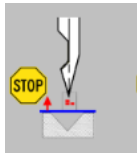
Laser Guarding can be programmed in E-Control in the PROGRAM (4) or RUN (5) tab. By pressing the machine guarding icon, E-Control will present all available (laser) guarding options. See images below for an explanation of all available laser guarding options in E-Control.





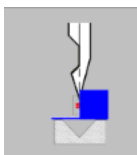
Laser Guarding

Press beam will move down in high speed to SCP and directly starts with bending the product.



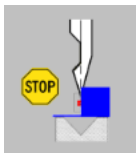
Laser Guarding Stop

Press beam will move down in high speed and stop at SCP. Release and press of foot pedal is required to start bending the product.



Laser Guarding Box Bending

Press beam will move down in high speed to an automatically higher set SCP and directly starts with bending the product. The first two laser beams of the AKAS 3PM are ignored to be able to use the box bending function.



Laser Guarding Box Bending Stop

Press beam will move down in high speed to an automatically higher set SCP and stop there. The first two laser beams of the AKAS 3PM are ignored to be able to use the box bending function. Release and press of foot pedal is required to start bending the product.



Foot pedal

The press beam will only move down in working. The AKAS 3PM will be muted the entire stroke.

Note!



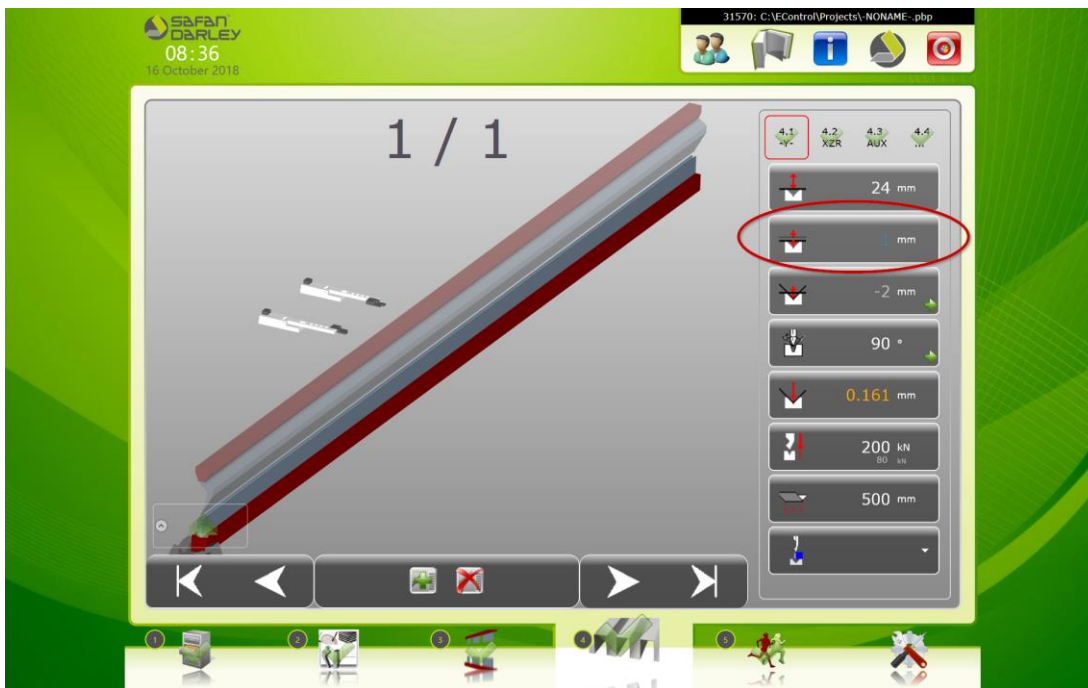
If a high-speed movement is programmed and one of the Laser beams is interrupted, the foot pedal needs to be released, and after a second depression, the upper beam will move down in working speed.



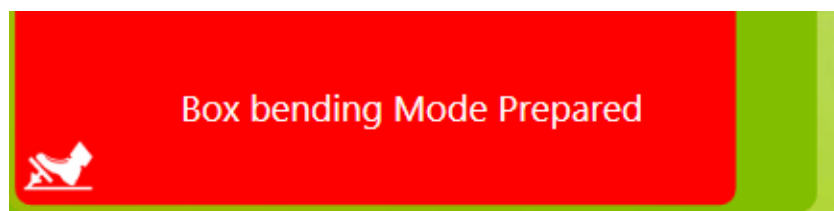
The AKAS can technically move safely to a SCP (mute point) as small as 0mm. The minimum programmable SCP (mute point) is dependent on the machine stopping distance and the corresponding settings in the Laser Guarding System. A SCP of 0mm is not desired because of the risk of touching the product at high speed. Therefore we use a minimum SCP of 1mm.

5.6.6 Activating Box Bending

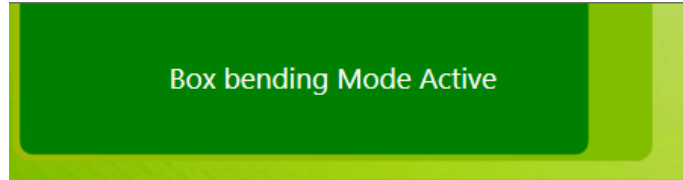
Because during Box Bending two of the three laser beams are ignored, the minimum SCP is higher than during normal Laser Guarding. If Box Bending is programmed, the SCP is automatically changed if it is lower than the minimum SCP for Box Bending Mode. If the SCP is changed by E-Control automatically, the value will be colored blue. The temporary blue SCP value will not be saved in the program. If the programmed SCP is higher or equal to the minimum Box Bending SCP the value will be colored white.



When using the option 'Laser Guarding Box Bending' or 'Laser Guarding Box Bending Stop', the operator always needs to confirm the programmed option by pressing the foot pedal. When Box Bending is programmed, there will be a message box to indicate that box bending is programmed and the foot pedal needs to be pressed. (see image below)



After pressing the foot pedal, there will be a new message box "Box bending Mode Active" in the top of E-Control to indicate that Box Bending is activated. (see image below)



When Box Bending is confirmed by pressing the foot pedal, box bending mode is active and the beam is ready to move down. If the foot pedal is pressed and the light beams are not interrupted, the upper beam will start moving downward in high speed.

5.6.7 Laser actuated AOPD system tests

Laser guard safety tests according to the standard NEN-EN12622:2009+A1:2013, listed in the standard as Laser actuated AOPD system tests where AOPD stands for **A**ctive **O**pto-electronic **P**rotective **D**evice, must be performed in the situations listed below:

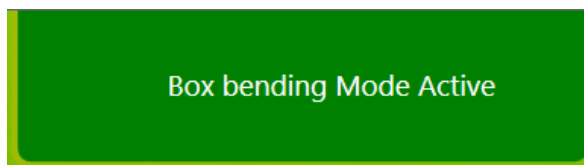
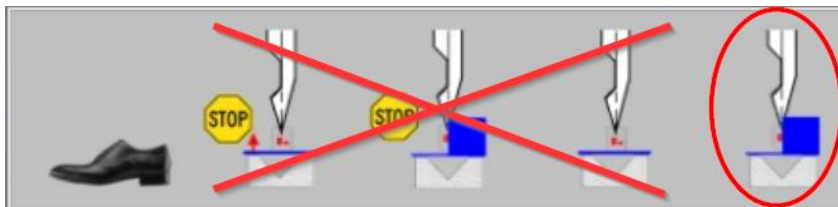
- At the beginning of each shift change
- At least once every 24 hours
- At every change of the uppertools/punch
- After every mechanical adjustment of the laser monitoring system

CAUTION:

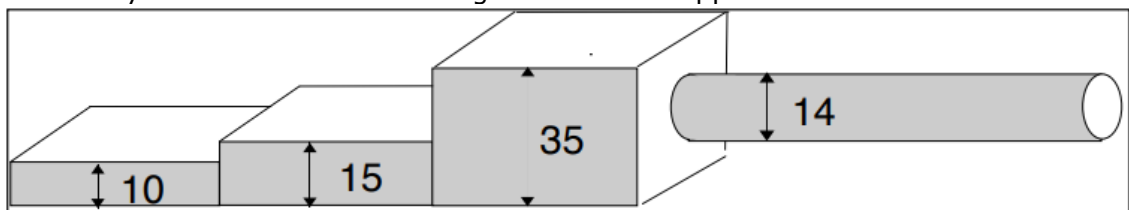
Even if two different tools have the same height, this is considered a tool change. The tests must be performed on both the left and right. (The instructions below comply with the applicable standard NEN-EN12622:2009+A1:2013).

Steps to be performed complete laser monitoring safety test::

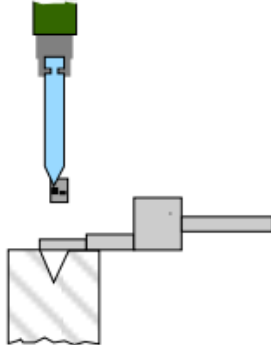
- 1) The test steps below should be performed on both the left and right sides of the machine.
- 2) Select, program, and place the desired tool configuration.
- 3) Send the press beam up to the maximum upper position (MSP).
- 4) Ensure that the AKAS transmitter and receiver are properly adjusted. (Setting the right laser guard height is explained in the following section 5.6.10.)
- 5) Enable Box-Bending mode without Stop at Mute/SCP to ensure that during the first safety test, the stop is not activated by the forward laser beam (SCP set to minimum value).



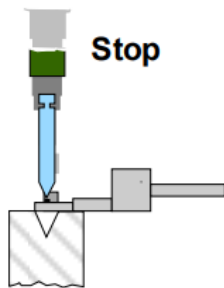
- 6) Place the tool on the left side of the machine first.
- 7) Then carry out the tests below using the test rod supplied with the machine.



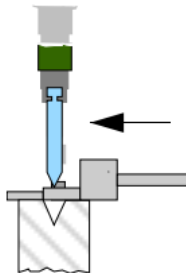
- a) The test rod must be placed on the lower tool in position "10". Then start the closing movement of the press (**Box-Bending active**).



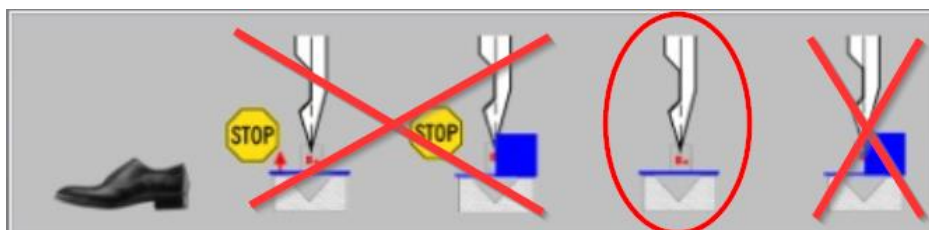
- b) The press beam comes to a stop. The machine should stop so that the upper tool/punch does not touch test rod position "10".



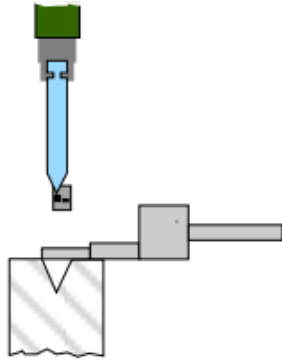
- c) Push the test rod with position "15" under the upper tool/punch. The test rod position "15" must not be touched by the upper tool/punch.



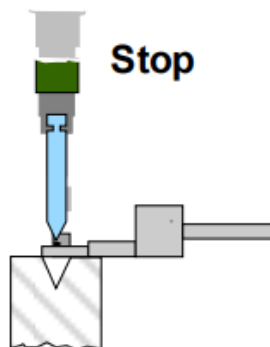
Then first **deactivate** Box-Bending mode before making the next press beam down movement. Select normal bending mode below without Stop at Mute/SCP:



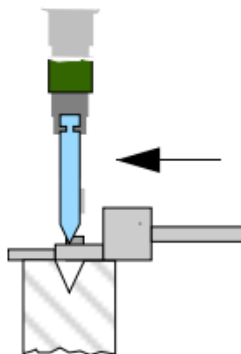
- d) The test rod must then be placed again on of the lower tool in position "10". Always return the press beam to its maximum upper position (MSP) first. Then start the closing movement of the press (**Box-Bending not active**).



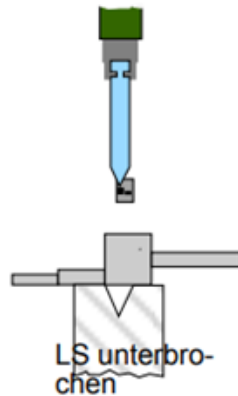
- e) The press beam comes to a stop. The machine should stop such that the upper tool/punch does not touch the test rod position "10" (**Box-Bending not active**).



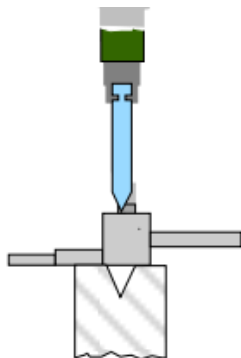
- f) Push the test rod with position "15" under the upper tool. The test rod position "15" must not be touched by the upper tool/die (**Box-Bending not active**).



- g) Move the press beam to the maximum upper position (MSP) and place the test rod in position "35" on the lower tool/die (**Box-Bending not active**). Then start the closing movement of the press.



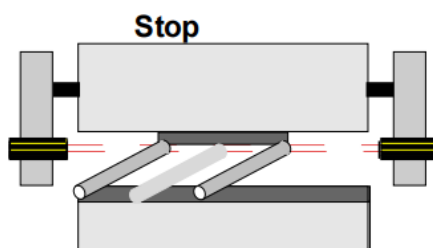
- h) The machine must stop so that the upper tool does not touch test rod position "35" (**Box-Bending not active**).



When the test steps have been successfully completed, the tests of steps 7a through 7h should be completed again also on the right side.



- i) The last step is only applicable for an AKAS security system with automatic height adjustment:
Switch on the transmitter (key switch for adjustment to position ON) Then move the test rod with position "14" along the top tool (from left to right and right to left). The LED E4 on the AKAS® receiver must always remain off.

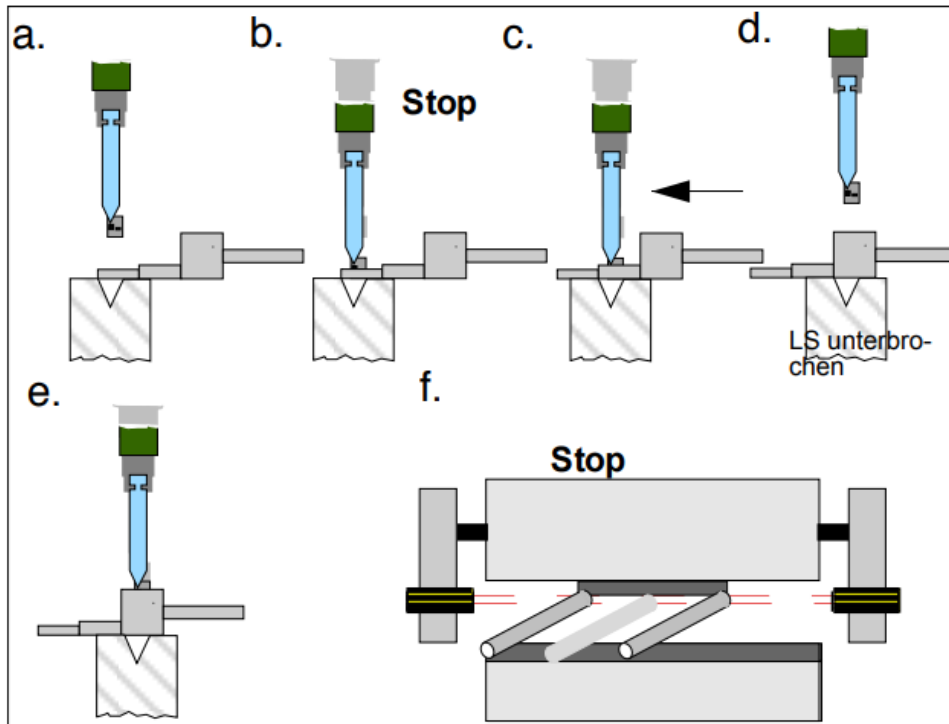


8) Insert the test rod back into the designated holder in the side door.

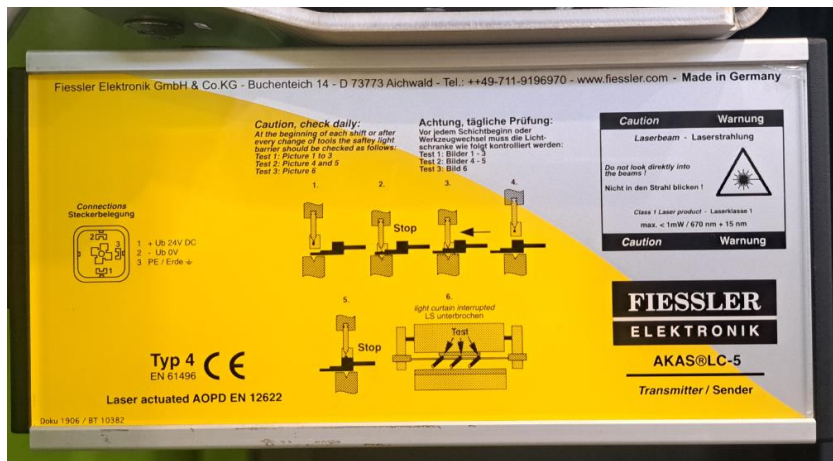
9) Only when all steps (left and right) can be successfully completed may the machine be put into operation. If this is not the case the machine will have to be stopped and taken out of service or may only be used in safe low press speed (Selector switch position 4). In this case always contact SafanDarley immediately for analysis of the problem and possible repair.



Overview steps laser monitoring safety test (left and right):



These steps are also listed on the Fieessler AKAS laser guarding transmitter as shown below.



5.6.8 Laser monitoring test E-Control control

(perform test procedure both left and right)

In order to ensure that the operator performs the safety tests at least once at a change of the upper tool/punch height, a procedure is included in the E-Control control for this purpose. The procedure below contains instructions for performing the tests on both the left and right side (i.e. 2 times) as prescribed according to the standard NEN-EN12622:2009+A1:2013.

CAUTION:

This therefore does not mean that in the other situations one is not obliged to perform the safety tests and it remains the final responsibility of the user(s)/operator(s) to perform these safety tests according to the instructions (and the standard NEN-EN12622:2009+A1:2013) in this manual in section 5.6.7 (The performance or non-performance of these tests is stored/logged in the control per operator depending on the login code used).




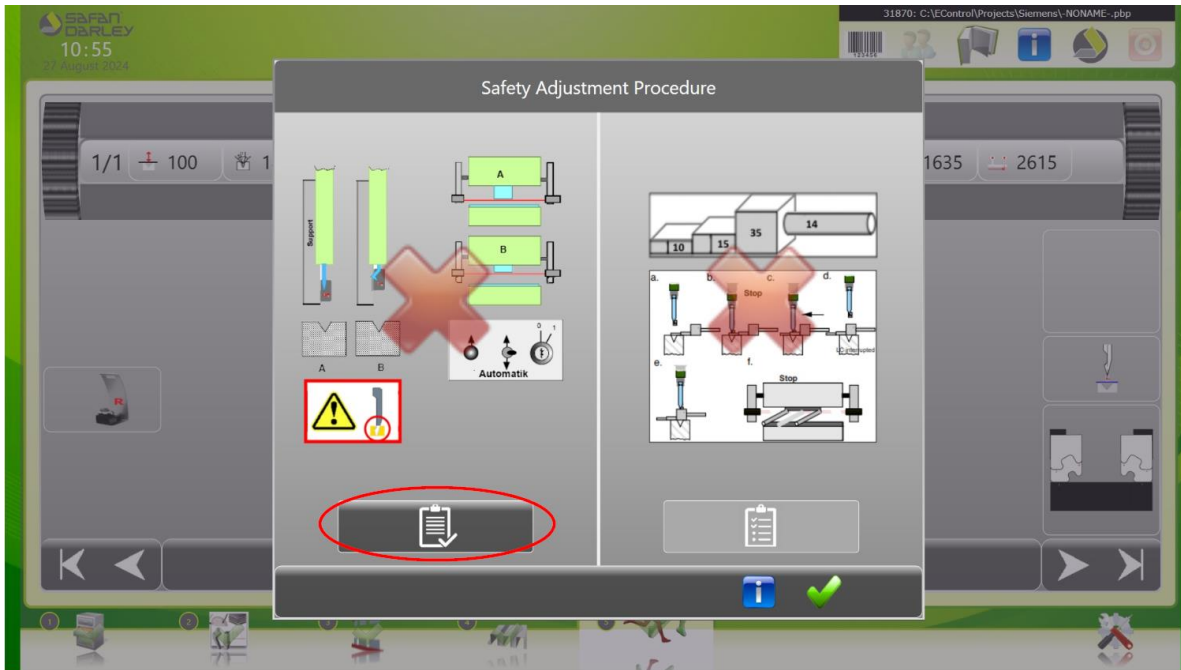
Explanation instructions laser guard safety test in control:

When the upper tool/punch height is changed by selecting a different punch and entering RUN mode, E-Control will display a help dialog to adjust the laser guard height and perform the mandatory safety tests.

(Please note that according to the standard, these safety tests must be performed as the procedure described in Section 5.6.7 that complies with the applicable standard).
Setting the right laser guard height is explained in the following section 5.6.10.





By pressing the left button  on the board, you confirm that you have adjusted the AKAS laser monitoring receiver and transmitter to the correct height in relation to the selected and mounted upper tool/punch. The icon is grayed out and the red cross becomes a green check mark.





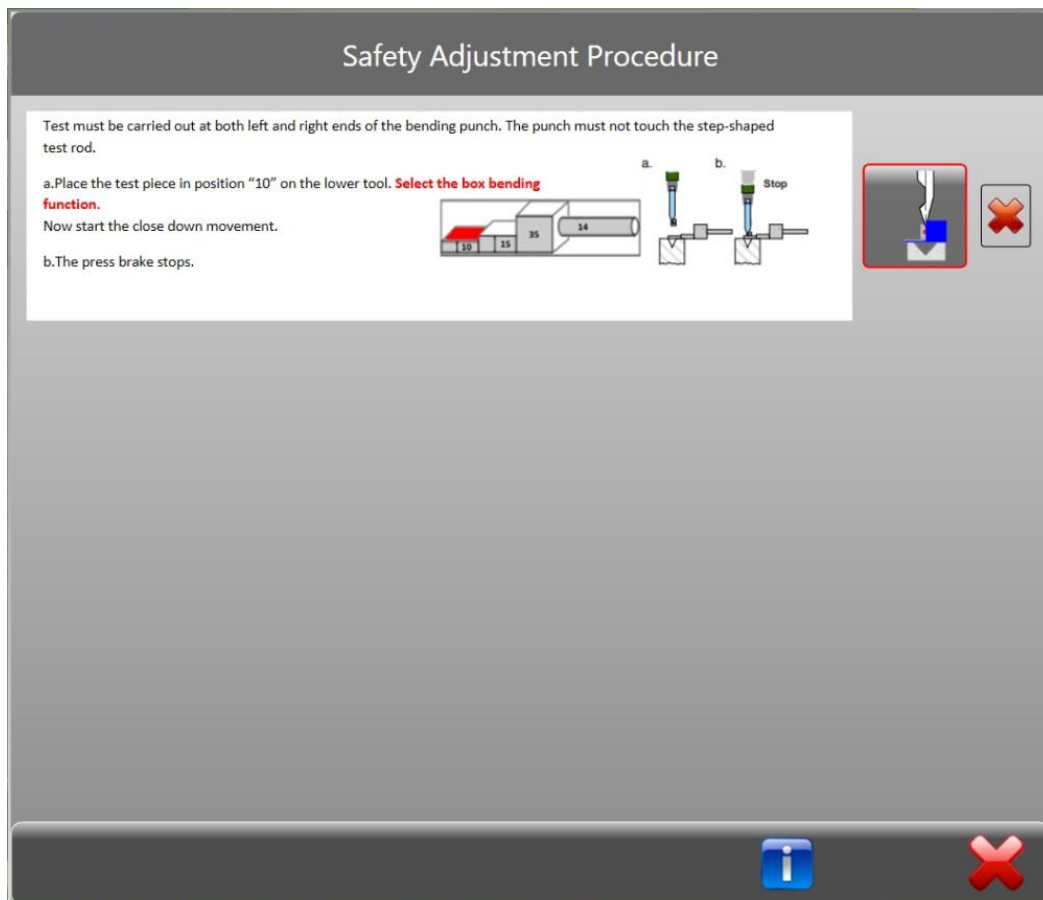
Now a checkboard button has also appeared on the right side. When you press the checkboard button, E-Control guides you **step by step through the test procedure:**

Pressing  or  will not display the test procedure. The user/operator of the press brake is still responsible for performing the safety tests. All these actions are saved/logged in the E-Control controller (Abortion and non-execution of this test is only allowed when the operator himself has already successfully carried out the complete testing procedure on the both the left and right side according to the instructions in section 5.6.7).

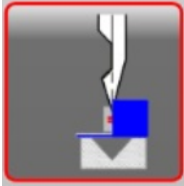
Step-by-step instructions guide the user through the safety test. If any part of the test is successfully completed, the user/operator must confirm this by pressing the check box with the red cross next to it and marking it with this with a green check mark for a positive test result.

Steps safety test procedure E-Control control:

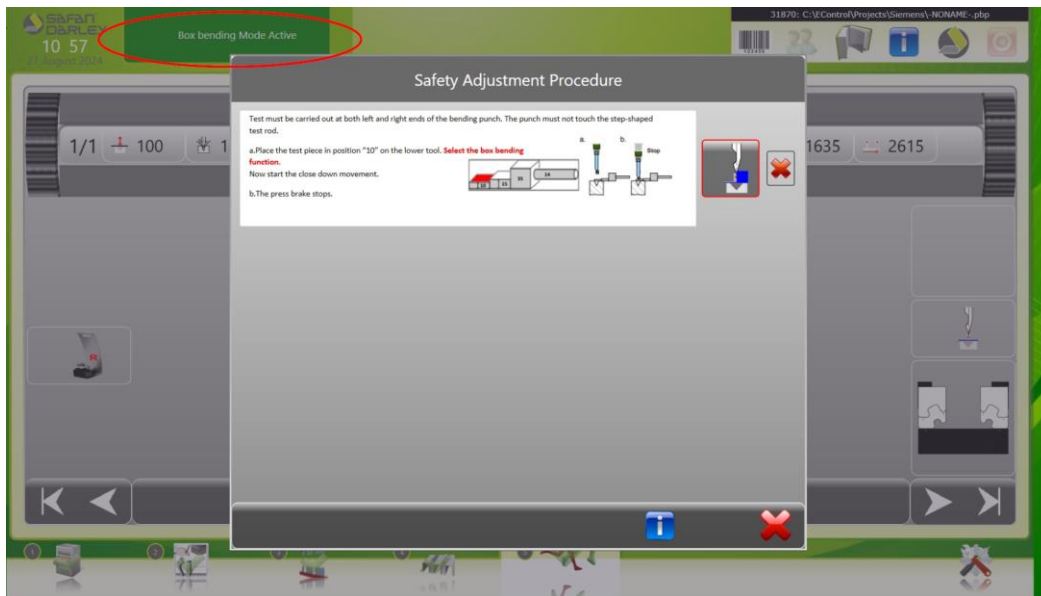
- 0) First place the tool on the **left side** of the machine.
- 1) At the first step of the test procedure, the following screen appears.



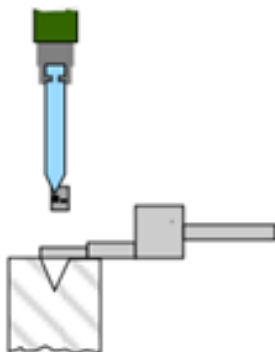
First activate Box-Bending mode by pressing the button below.



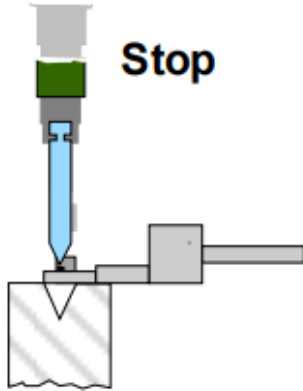
The top left of the screen should show that Box-Bending is activated.



The test rod should be placed on the lower tool/die on the **left side** of the machine in position "10".



Then start the closing movement of the press beam.
The press beam comes to a stop.



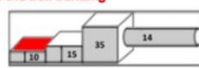
If the test rod position "10" has not been hit, confirm this step of the test on the **left side** by pressing the red cross to the right of the test description.


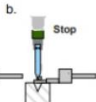
Safety Adjustment Procedure


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.**
Now start the close down movement.

b. The press brake stops.





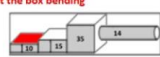
2) After this, the 2nd step of the safety test is displayed on the left.



Safety Adjustment Procedure


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.**
Now start the close down movement.

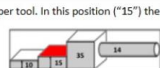
b. The press brake stops.












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.

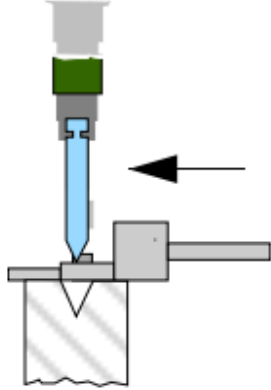






Push the test rod with position "15" under the upper tool on the left side of the machine. The test rod position "15" must not be touched by the upper tool/die.



If the test rod position "15" has not been hit, confirm this step of the test on the **left side** by pressing the red cross to the right of the test description.

3) After this, the 3rd step of the safety test on the **left side** is displayed.

Safety Adjustment Procedure

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.

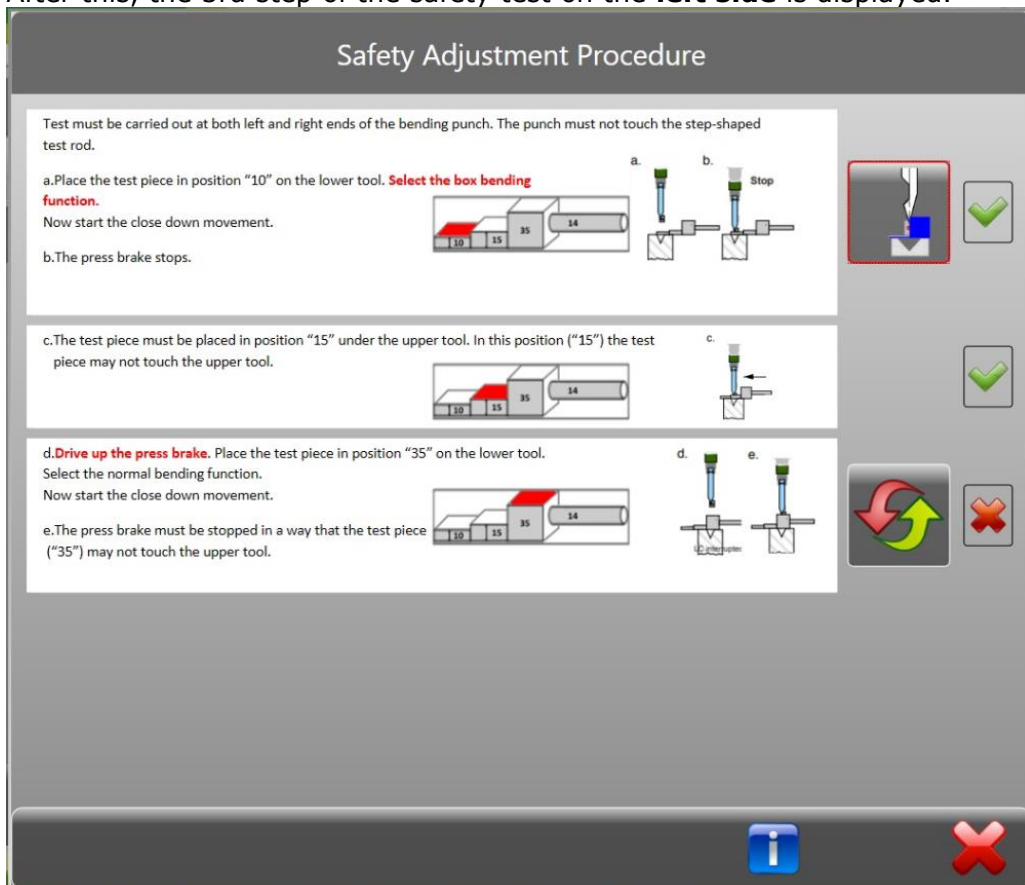
a. Place the test piece in position "10" on the lower tool. **Select the box bending function.** Now start the close down movement.




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 test piece in position "35" on the lower tool. Select the normal bending function. 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.



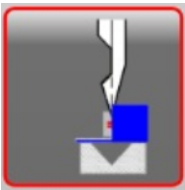






Then operate the return button below to first send the press beam up to its maximum upper position.

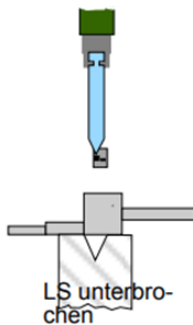


Then first deactivate Box-Bending mode before making the next press beam down movement. Press the button below.

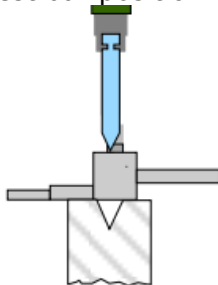


Verify that the green screen at the top left that Box-Bending activated has disappeared before continuing with the test on the **left side**.

Then start the press beam down movement.



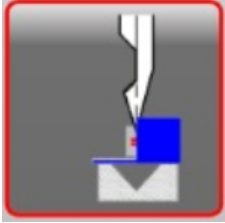
The press beam should stop without the upper tool/punch on the **left side** touching the test bar position "35".



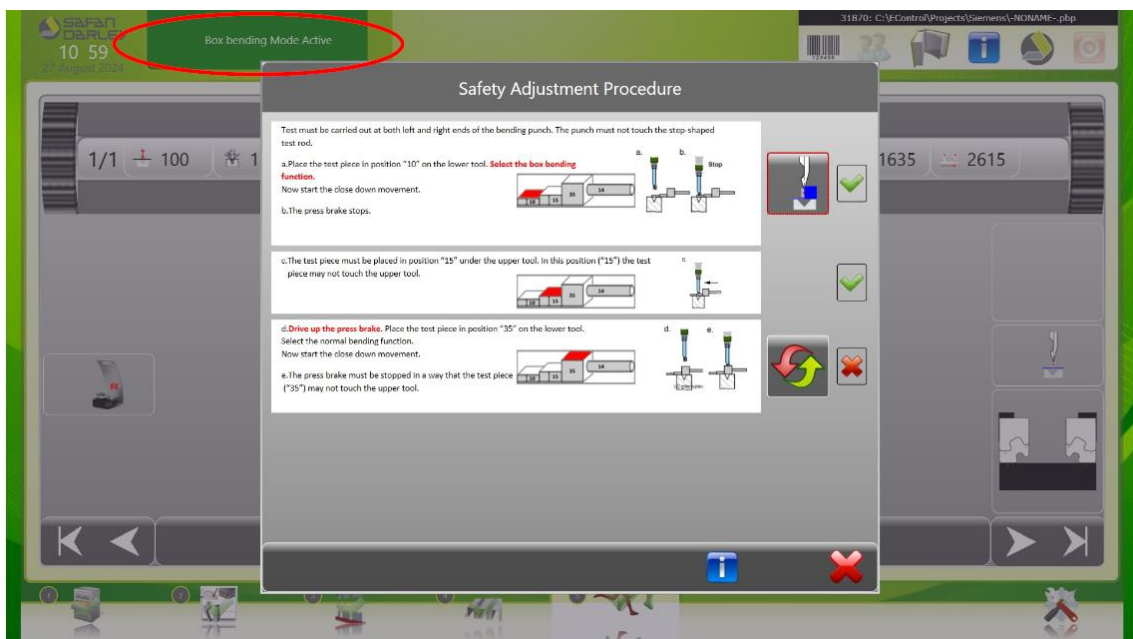
If the test rod position "35" has not been hit, this step must NOT yet be confirmed before the above tests (steps 1 to 3) have been performed again on the right side.



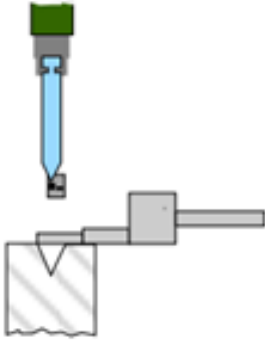
- 4) Place the programmed tool on the **right side** of the machine.
Activate Box-bending mode again by pressing the button below.



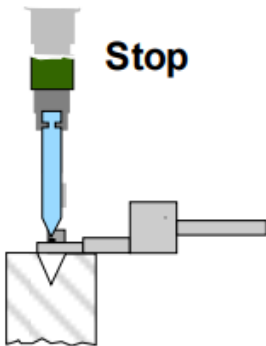
The top left of the screen should show that box-bending is activated.



The test rod must be placed on the lower tool/die on the **right side** of the machine in position "10".

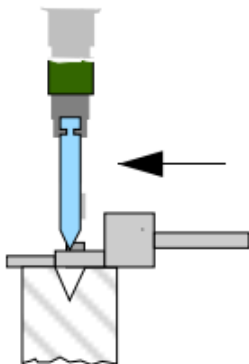


Then start the closing movement of the press beam. The press beam comes to a stop.



- 5) When the test rod position "10" is not hit, the 2nd step of the safety test on the **right side** must be performed.

Push the test rod position "15" under the upper tool on the **right side** of the machine. The test rod position "15" should not be touched by the upper tool/punch.




When the test rod position "15" is not hit, we proceed to the 3rd step of the safety test on the **right side**

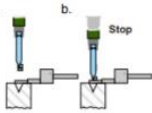
Safety Adjustment Procedure

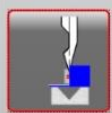

Test must be carried out at both left and right ends of the bending punch. The punch must not touch the step-shaped test rod.

a. Place the test piece in position "10" on the lower tool. **Select the box bending function.** Now start the close down movement.

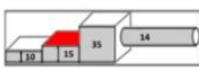




b. The press brake stops.







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.

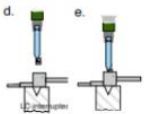









d. **Drive up the press brake.** Place the test piece in position "35" on the lower tool. Select the normal bending function. Now start the close down movement.



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



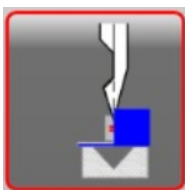



Then operate the return button below to first send the press beam up to its maximum upper position.

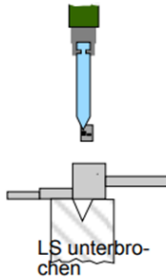


Then first deactivate Box-Bending mode before making the next press beam down movement. Press the button below.

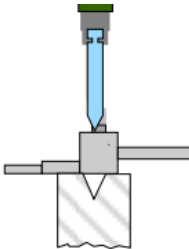


Verify that the green screen at the top left that Box-Bending activated has disappeared before continuing with the test on the **right side**.

Then start the press beam down movement.



The press beam should stop without the upper tool/punch on the **right side** touching the test bar position "35".



If the test rod position "35" is not hit, confirm this step of the test by pressing the red cross to the right of the test description.

Safety Adjustment Procedure

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.** 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 test piece in position "35" on the lower tool. Select the normal bending function. 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.

6) After this, the 4th and final step of the safety test is displayed.

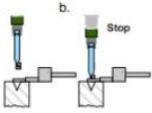
Safety Adjustment Procedure


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.** Now start the close down movement.

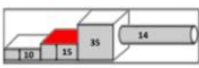




b. The press brake stops.



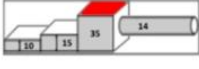


c. The test piece must be placed in position "15" under the upper tool. In this position ("15") the test piece may not touch the upper tool.

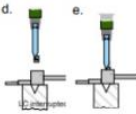






d. **Drive up the press brake.** Place the test piece in position "35" on the lower tool. Select the normal bending function. Now start the close down movement.


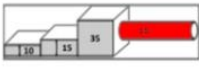


e. The press brake must be stopped in a way that the test piece ("35") may not touch the upper tool.

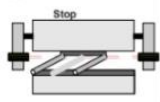







f. Turn on the sender (adjustment **keyswitch to ON position**) and move the test piece ("14") along the tip of the upper tool. The adjustment control LED P1 on the AKAS receiver has to remain ON during the test.

f. Stop

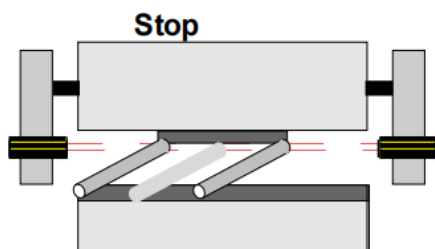




This next 4th step is only applicable for AKAS laser guarding with automatic height adjustment:

Switch on the transmitter (key switch for adjustment to position ON) Then move the test rod with position "14" along the top tool (From left to right and from right to left). The LED E4 on the AKAS® receiver must always remain off.



If the movement of the test rod position "14" has not hit (LED E4 remains off) or if automatic height adjustment is not applicable, confirm this step of the test by pressing the red cross to the right of the test description.

Safety Adjustment Procedure

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.**
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 test piece in position "35" on the lower tool. Select the normal bending function.
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. Turn on the sender (adjustment **keyswitch to ON position**) and move the test piece ("14") along the tip of the upper tool.
The adjustment control LED P1 on the AKAS receiver has to remain ON during the test.

Then press the button  at the bottom of the screen to complete the steps performed.

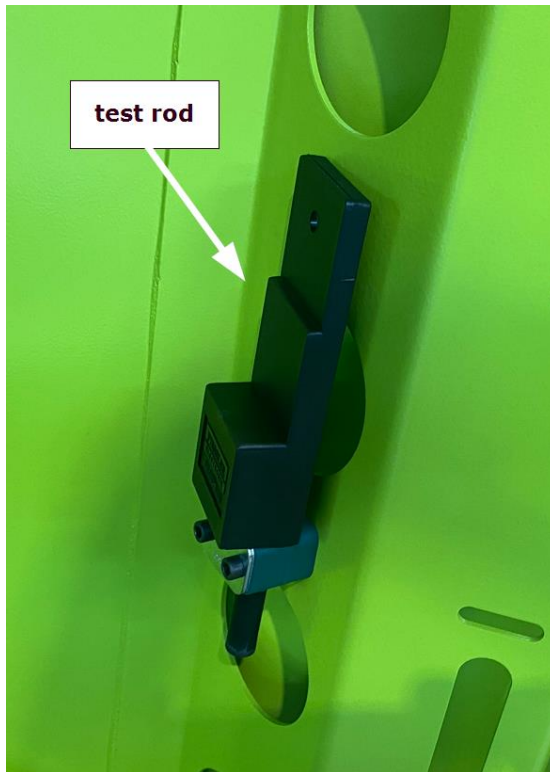
After this, the following screen is displayed:

Safety Adjustment Procedure

The screen displays diagrams for 'Support', 'Automatik', and test piece positions (10, 15, 35, 14). A large green checkmark is overlaid on the diagrams. At the bottom, there is an information icon and a green checkmark button.

If the complete test was performed, the procedure can be completed by pressing the button .

- 7) Insert the test rod back into the holder provided for this purpose in the side door.

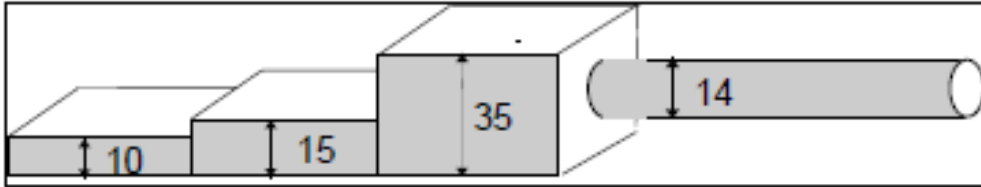


- 8) Only when all test steps (both left and right) can be successfully completed may the machine be put into operation. If this is not the case the machine will have to be stopped and taken out of service or may only be used in safe press speed (Selector switch position 4). In this case always contact SafanDarley immediately for analysis of the problem and possible repair.

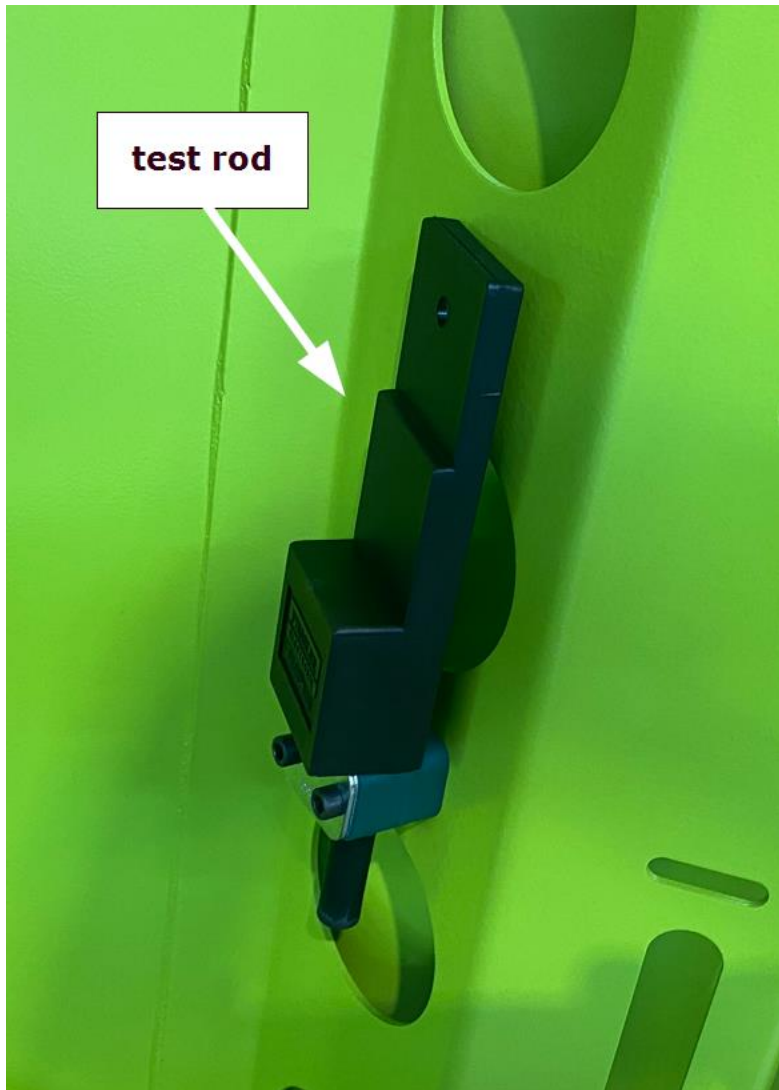


5.6.9 AKAS test rod

The necessary test rod:



The test rod is located in the side door of the machine should also always be placed back here after performing each laser guard safety test.

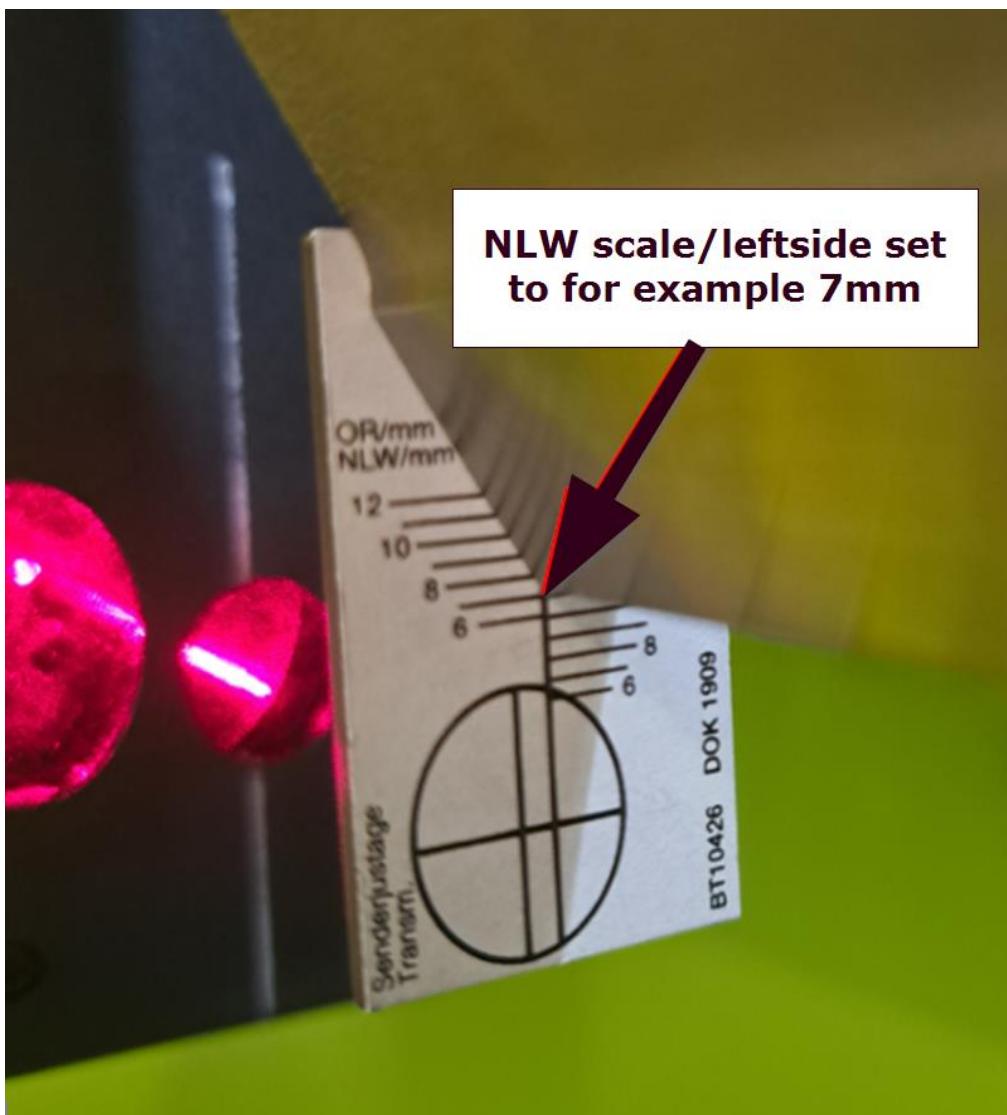


5.6.10 Checking the alignment of the laser beam

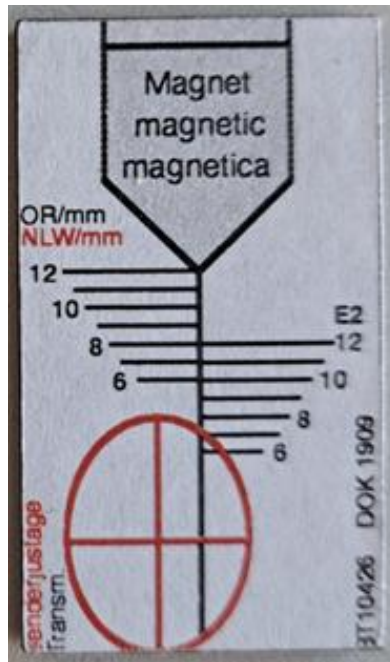
The AKAS 5 laser protection system must be selected and the main motor switched off. When the foot pedal (right) is pressed, the laser beam is switched on to align and check the AKAS 5 laser.

Place the magnetic alignment plate on the side of the transmitter and set the punch point to e.g. 7 mm. This value may vary from machine to machine, depending on the value of the laser guard overrun distance. The value is also equal to the value of the overrun distance. The overrun distance can be found in the technical data in chapter 3.1.2 or on the type plate of the machine.

(Note: Use the NLW scale on the left-hand side, as shown in the illustration below).



Then check the height at which the laser is projected, as shown below.

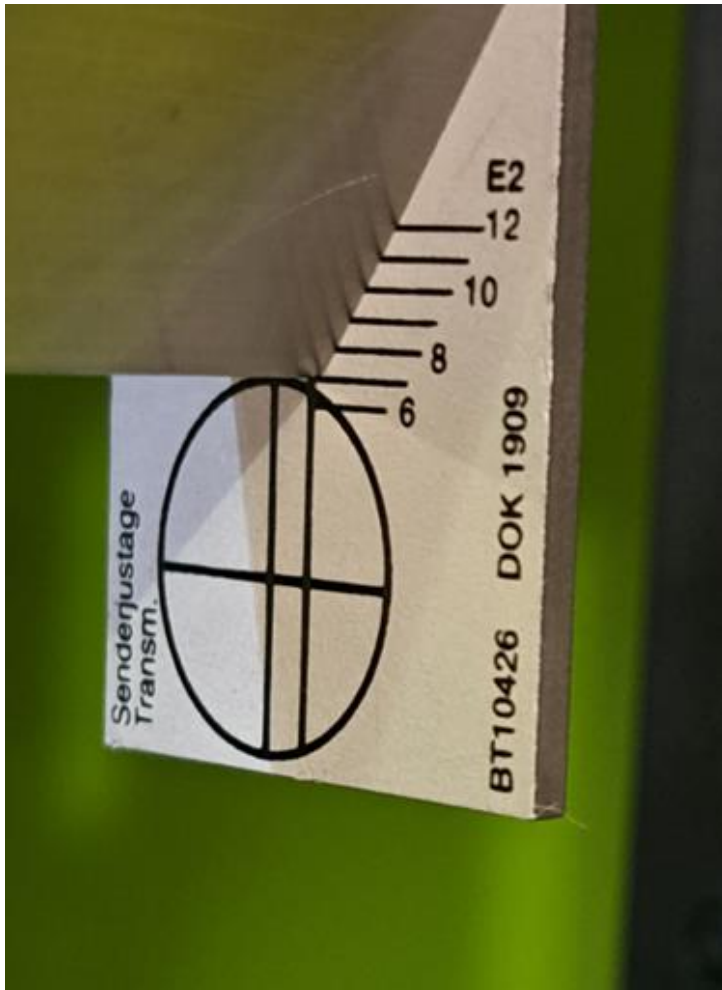


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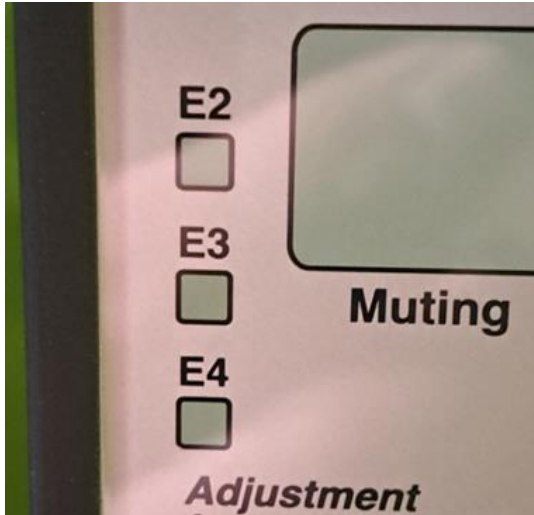
Next, place the magnetic alignment on the right side of the receiver, as shown below. Again, the punch point should be set to the value of the overrun distance using the NLW scaling. The laser should be displayed as shown below. If this is correct, the laser beam will run parallel to the punch from the left side of the machine to the right side.



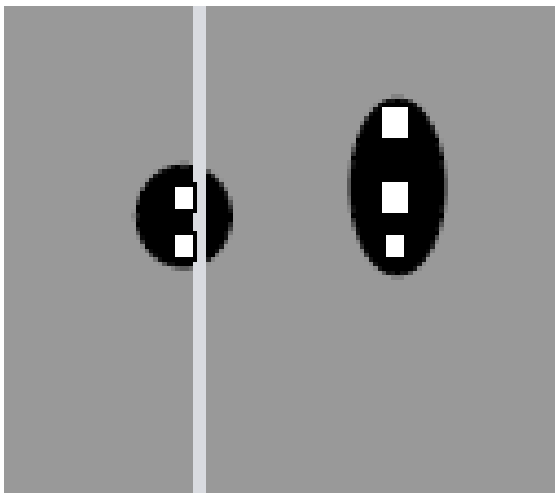
The parallelism of the laser beam to the punch has now been checked. Now check that the height of the AKAS 5 receiver is correct. To check the height of the receiver, use the E2 scale and set the magnetic alignment plate at the tip of the boom to the value of the overrun distance, as shown below.



The next step is to move the AKAS 5 receiver (in height as follows).



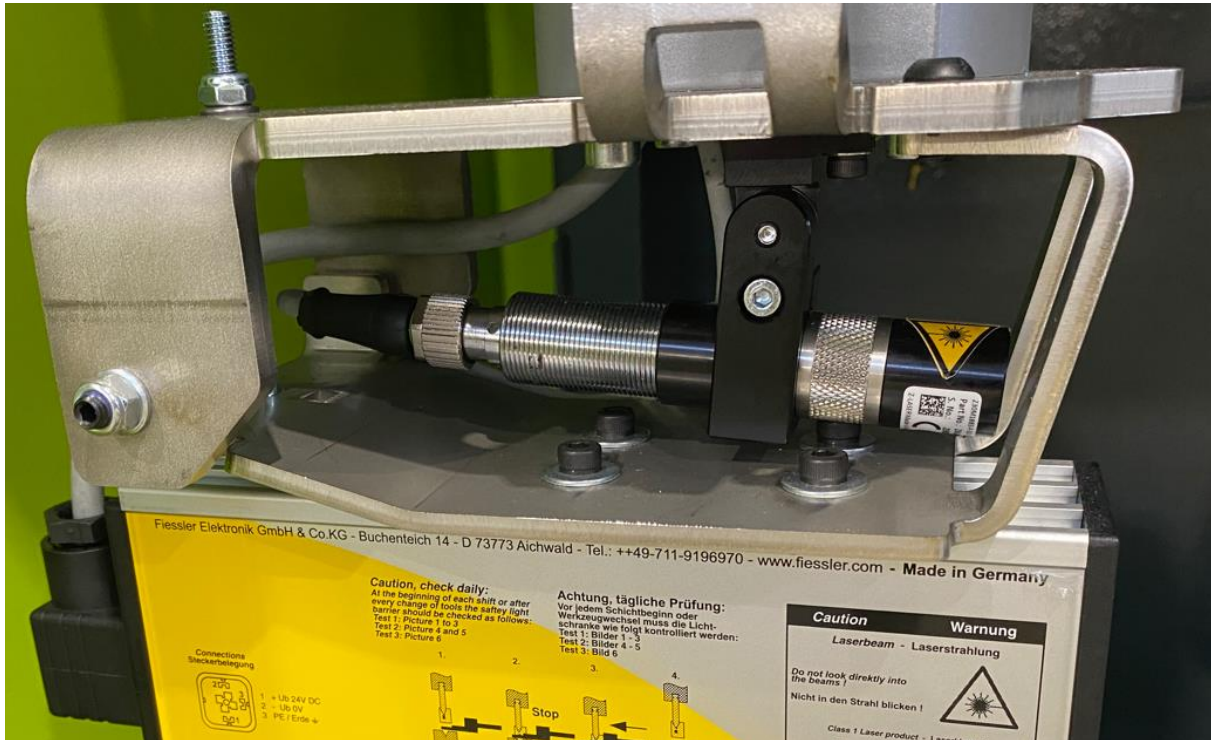
- First move the receiver upwards until the E2 LED lights up.
- Then slowly move the receiver upwards until the E2 LED goes out.
- Then slowly move the receiver down again until the E2 LED lights up again.
- Fix the height of the receiver in this position.
- The position of the laser beams must be displayed on the receiver as shown below.



After this test, the Fiessler AKAS®LC-5 M laser beam safety device is now ready for use!

5.7 Laser Line Projection

5.7.1 General



One of the distinguishing features of a SafanDarley press brake accessories is that they are easy and safe to operate.

This press brake is equipped with a Laser Line projection, in implementation with the E-Control.

The laser line will be projected onto the plate.

The operator then can position the sheet precisely under the laser line to bend the sheet to the correct position.

The Laser Line projection function is programmable on a step-by-step basis.



Never look into the laser beam. The laser light may result in permanent eye damage.

Never disassemble the laser yourself.

Have all repairs performed by competent SafanDarley personnel.

5.7.2 Operation of the laser line projection

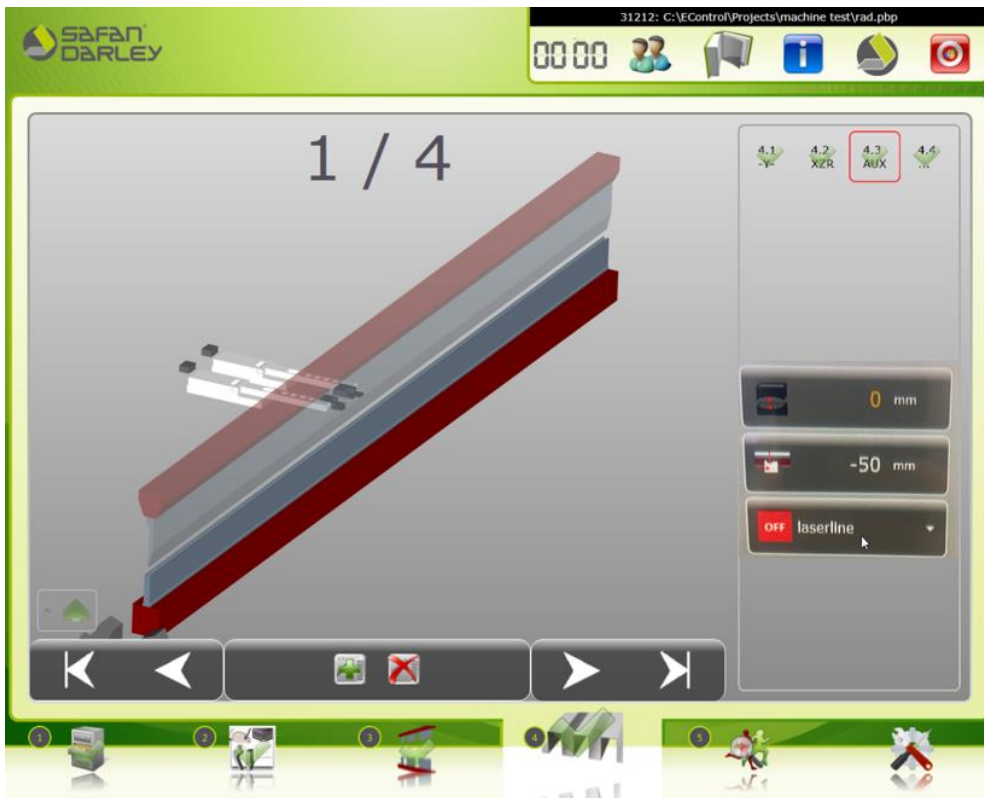


In E-Control press  to go to Tab 4.



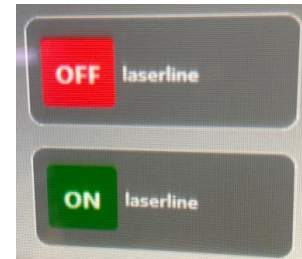
Then press  on .

The following screen will appear.



In this screen you will find the Laser Line Function On/OFF button.





This button shows that the Laser Line Function is OFF or ON.
(Color red = OFF, color green = ON)

Per program step, the Laser Line can be set to "ON" or "OFF" by selecting the "ON" or "OFF" option function in the selection menu.

After selection press "run mode" 5  and the flashing "mute" button.

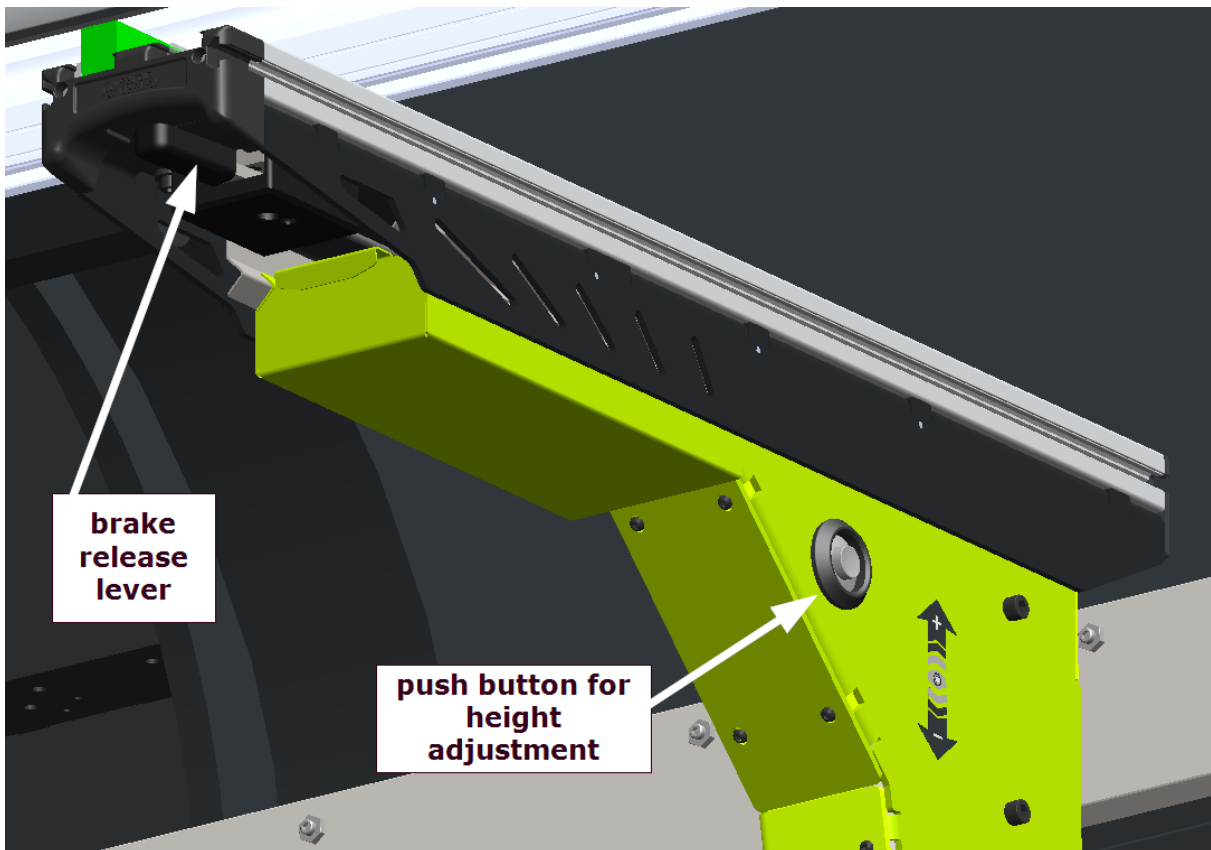
"mute" button



Now after pressing the foot pedal the laser line will turn off or on.

5.8 Modular support arms

This machine is equipped with 2 modular support arms where you can choose which type of support the customer wants. The choice includes: ball rollers, brushes and wear strips. The modular arms are adjustable in two directions, from left to right with the brake release lever on the front of the aluminum arm and stepless in height with the push button for height adjustment, whereby the standard die heights of 55 and 100 mm are already preset.



5.9 MAINTENANCE

5.9.1 General

Maintenance may only be carried out by expert personnel or by a SafanDarley engineer. During maintenance no operation is allowed. The main switch must be locked with a padlock.

During maintenance, observe the safety precautions (chapter 2.2).

An overview of the lubrication maintenance is given in the attachments.

This manual is for use only for machine lubrication. Other maintenance must be performed by a SafanDarley engineer.

5.9.2 Lubrication

The appendix shows what and when to lubricate.

5.9.3 Maintain air filters E-cabinet

The appendix shows the explanation of the maintenance of the air filters in the E-cabinet.

5.9.4 Warning for cleaning Wila NSCR crowning

The Wila Crowning/Table Clamping may never be cleaned with solvent or compressed air. This can cause damage to the clamping! On the enclosed USB stick you can find the complete instruction manual of the Wila Clamping/Crowning devices!

5.9.5 Yearly Preventive replacement of PLC CPU battery !!!

The SafanDarley H-iBrakes are equipped with a Sigmatek S-Dias PLC CPU type CP 112 or CP 313. These CPU's (or the attached PS101 power supply modules) have an exchangeable lithium battery to power a real-time clock and zero-voltage proof RAM in the CPU.

The exchangeable buffer battery ensures that programs and data in the expanded memory (SRAM) as well the clock time (RTC) of the CPU module are preserved in the absence of a supply voltage. A lithium battery is installed at the manufacturer. The battery normally has enough capacity to preserve data in the absence of a supply voltage for up to 3 years.

SafanDarley recommends however, that the battery should be replaced annually to ensure optimal performance (This is also the recommendation of Sigmatek).

The battery can only be exchanged when power is supplied to the Terminal, otherwise data loss will occur.

WARNING:



Fire and explosion hazard! Minor to severe injuries may occur due to incorrect use of the battery. Do not recharge, disassemble or dispose of battery in fire.

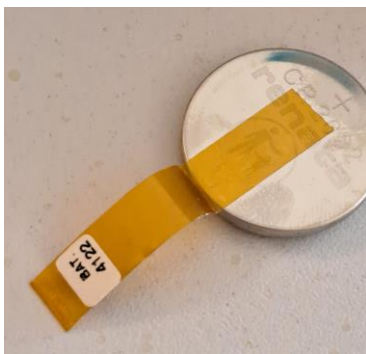
A weak battery is first detected by the supervisor circuit on the CPU module and displayed by the control software. When the battery voltage continues to fall, the red LED "Battery Low" lights. The battery must be replaced soon to avoid data loss in case of power failure. When the battery voltage is in between the supervisor circuit thresholds, it may happen that the battery is detected "good" during operation, but "low" after a power cycle. If this happens, it is recommended to replace the battery. If the battery is low, the CPU startup test will fail, and the CPU doesn't start!

Specifications Lithium battery

Manufacturer : **RENATA**
Battery order no. Sigmatek : **01-690-028**
Battery art.no SafanDarley : **30.2291.6900.28**

Note:

Only this type of Lithium batteries from the manufacturer RENATA are allowed being used in order not to compromise the warranty conditions from Sigmatek (and SafanDarley). Only the original Sigmatek batteries delivered by SafanDarley (Art.no. 30.2291.6900.28) are to be used because these have a pull strap to remove the backup battery from the CPU. Without this strap it will be very difficult to remove/replace the battery without damaging the CPU or power supply module. (also depending on the position of the CPU in the electrical cabinet).

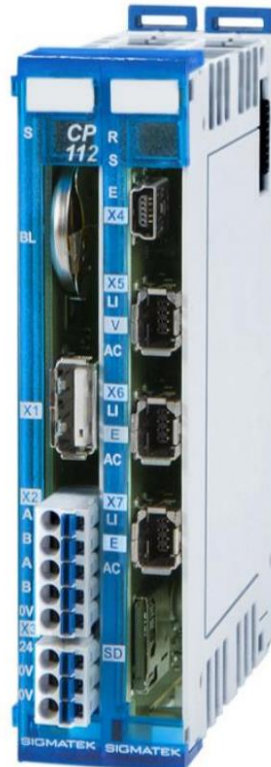


The following CP-112 and CP- 313 versions are used:

CP 112-1 with PS101
Power supply module



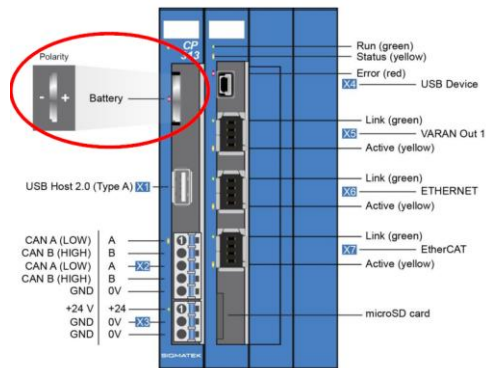
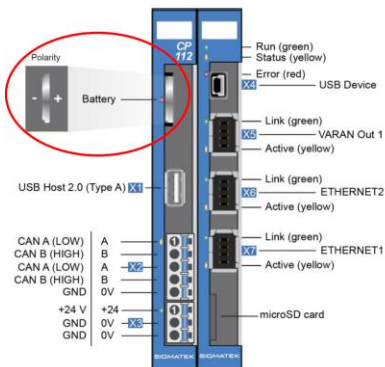
CP 112-2 with integrated
power supply module



CP 313 with integrated power supply Module

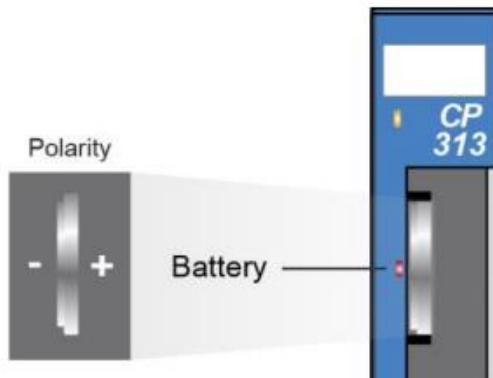


Position of buffer battery



IMPORTANT:

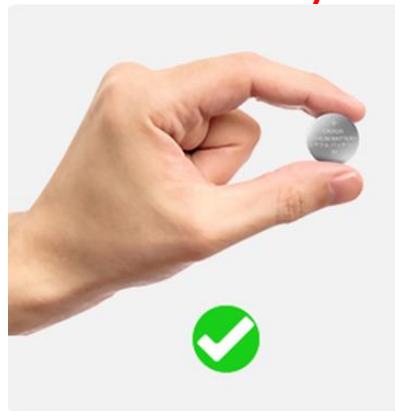
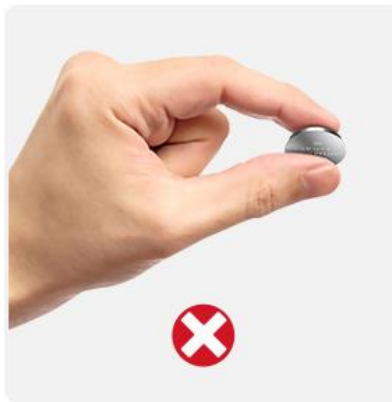
- The battery can only be exchanged when power is supplied to the Machine/CPU otherwise data loss will occur. Make sure the battery polarity is as shown on the picture below before pushing a new battery into the slot.



- Removing old and placing new battery:
 Pul the plastic strap to remove the battery from the slot and make sure the plastic strap from the new battery is sticking outside while moving the new battery into the slot (Plastic strap is normally mounted on the + pole of the battery but always double check first).



- Handling the batteries:
Caution
Because the human body is conductive, the battery can be discharged if one touches both the plus and minus terminals of the battery at the same time. Avoid this so as not to affect the life of the battery.



- Also stick the SafanDarley sticker like displayed below on the **inside of the electrical cabinet door at eye-level** (first remove the old sticker if present). Mark the month and year when the battery is changed and also when the battery needs to be replaced again (1 year after date of changing). The sticker below will also be included in the delivery of new batteries delivered by SafanDarley.

PLC battery changed											
1	2	3	4	5	6	7	8	9	10	11	12
2024	2025	2026	2027								
Next battery change											
1	2	3	4	5	6	7	8	9	10	11	12
2024	2025	2026	2027								

- PLC CPU Battery needs to be replaced annually.

6. Appendices

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**** All information, documentation and diagrams are to be found on the enclosed USB stick.**

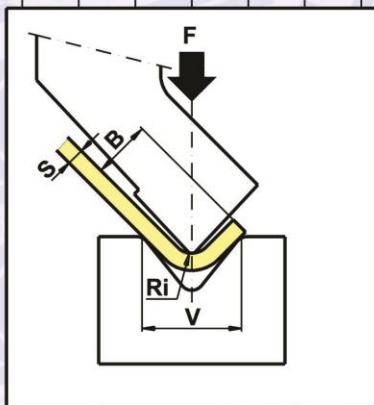
6.1.1 Appendix 1: Press table

BENODIGDE PERSKRACHT BIJ 90° VRIJBUIGEN
 ERFORDERLICHE PRESSKRAFT FÜR 90° FREIBIEGEN
 REQUIRED PRESS-FORCE AT 90° AIR-BENDING

F = kN / m¹



Ri [mm]	B [mm]	V [mm]	Bs = ± 420 N/mm ²																		
			s [mm]																		
			1	1.5	2	2.5	3	4	5	6	8	10	12	14	15	16	18	20	25	30	
1.0	4	6.5	100																		
1.2	5	8	80	200																	
1.5	6	10	55	140	290																
1.8	7	12	45	110	220																
1.9	7.5	13	15	100	200	340															
2.1	8.5	14	40	95	180	300															
2.2	9	15	30	80	160	275	430														
2.4	9.5	16	30	80	150	250	400														
2.8	11	19	25	65	120	200	300														
3.0	12	20	25	60	110	190	280	580													
3.1	13	21	20	55	105	175	270	550													
3.6	15	24	20	50	95	150	220	440													
3.7	16	25	20	50	90	145	215	420	730												
3.9	17	26		45	80	130	200	400	680												
4.2	18	28		45	75	120	190	360	600												
4.5	19	30		40	70	110	170	330	550	870											
4.8	20	32		40	65	105	160	300	500	790											
5.2	22	35		30	60	95	145	265	440	690											
5.7	24	38		30	55	90	125	240	400	600											
6.0	25	40		25	50	80	120	225	370	580	1170										
6.3	27	42			50	80	115	215	350	550	1090										
7.2	31	48			45	65	100	180	300	440	880										
7.5	32	50			40	60	95	170	290	420	830	1450									
7.8	33	52			40	60	90	165	260	410	790	1370									
8.2	35	55				55	80	155	250	380	730	1250									
8.7	37	58				55	75	140	240	350	680	1150									
9.0	38	60				50	75	135	220	340	650	1100	1740								
9.8	41	65				50	70	125	200	310	590	990	1540								
10.5	44	70					65	120	190	280	530	890	1380	2030							
11.0	48	75					60	110	180	250	480	810	1230	1800	2160						
12.0	51	80					55	100	165	240	450	750	1160	1660	1930	2310					
12.7	53	85					50	95	150	220	420	690	1080	1500	1790	2090					
13.5	56	90						90	140	210	390	640	1050	1370	1630	1920	2560				
14.2	59	95						80	140	200	360	600	920	1310	1550	1810	2420				
15.0	62	100						75	125	190	350	570	850	1210	1430	1680	2220	2900			
16.0	64	105						75	120	175	330	530	800	1130	1330	1550	2060	2680			
16.8	68	112							110	165	300	500	740	1050	1220	1430	1890	2440			
18.0	73	120							105	150	280	450	680	910	1120	1310	1720	2220	3870		
19.2	78	128							100	140	260	420	630	880	1040	1210	1570	2040	3500		
21.0	85	140							95	130	240	380	570	790	920	1060	1500	1790	3050		
22.5	92	150								120	220	350	520	730	850	980	1270	1630	2780	4400	
24.0	98	160								110	210	330	480	680	790	900	1190	1500	2540	3940	
25.5	105	170								105	190	310	450	630	730	850	1090	1400	2300	3630	
27.0	112	180									180	290	420	580	680	780	1010	1290	2140	3320	
28.5	119	190									165	260	400	550	640	720	950	1200	1980	3060	
30.0	126	200									155	250	370	510	600	690	890	1120	1870	2860	
31.5	133	210									150	240	350	480	570	650	850	1070	1760	2690	
34.0	143	225										220	330	450	530	600	770	980	1600	2420	
36.0	154	240										210	310	420	480	560	730	910	1470	2240	
37.5	161	250										200	280	400	450	530	690	870	1400	2120	
40.0	174	270										190	260	370	420	480	630	790	1280	1940	
42.0	181	280											250	350	410	470	600	760	1210	1840	
45.0	195	300												240	330	380	440	560	700	1130	1700





H-iBrake 320-3200



6.1.2 Appendix 2: Setup machine



H-iBrake 320-3200



6.1.3 Appendix 3: Main cylinders 320T S350

Rev.	CC nr.	Description	Date	Name
B		CHANGE POS. 01	17-1-2024	JJV
C		CHANGE POS. 01	22-4-2024	JJV

Pos.	Qty.	Description	Number	Rev.	Article
14	1	GELUIDDEMPER 1/8"			304530000301
13	1	O-RING 27X7 ORIE27200			
12	1	AFSTRIJKER 17WE3202500-T46N			
11	1	RIMSEAL 17RR1302500-Z52N			
10	1	STEPSEAL 17RSK402500-T46N			
9	2	GUIDING ORKOT C380-25150-2500-A			
8	2	GUIDING 10E/GTP1-25150-2600-A			
7	1	MANCHET 17PT0402600-Z80N			
6	16	SCREW M12x50 12.9 DIN912			210112144
5	1	COVER CYLINDER 320T	250483	A	722032250483
4	1	PLUNGER 320 S350	250482	A	722032250482
3	1	CYLINDER PIVOT BEARING	200235	A	723043202004
2	1	VHR 90-3 4 ED			303047031003
1	1	HOUSING LE 320T S350 NG10	250481	C	722032250481

Surface : DIN ISO 1302		Projection Method					
Geometric Tolerancing : DIN ISO 1101							
Edges of undefined shape : DIN ISO 13715		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Name</th> <th>Date</th> </tr> <tr> <td>JJV</td> <td>13-6-2023</td> </tr> </table>		Name	Date	JJV	13-6-2023
Name	Date						
JJV	13-6-2023						
General tolerances : ISO 2768-m-H		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Drawn</th> <th>Checked</th> </tr> <tr> <td></td> <td></td> </tr> </table>		Drawn	Checked		
Drawn	Checked						
Scale: 1:5	Mass: 586.75 kg	Description: ASM CYL. 320T S350 NG10 LEFT CYLINDERS					
Material:		Article Number: 622032250480					

Website: www.safan-darley.com
 Email: info@safan-darley.com
 P.O. Box 98, NL-2200 ZG, The Netherlands | Tel: +31 (0)45268 54 00 | Fax: +31 (0)45268 54 01
 P.O. Box 100, NL-2200 ZG, The Netherlands | Tel: +31 (0)45268 54 00 | Fax: +31 (0)45268 54 01

Project:	250480
Revision:	C
Format:	A3

Rev.	CC nr.	Description	Date	Name
B		CHANGE POS. 01	17-1-2024	JIV
C		CHANGE POS. 01	22-4-2024	JIV

SECTION A-A

**DETAIL B
SCALE 1 : 2**

**DETAIL C
SCALE 1 : 2**

Total surface area = 2,93 m²

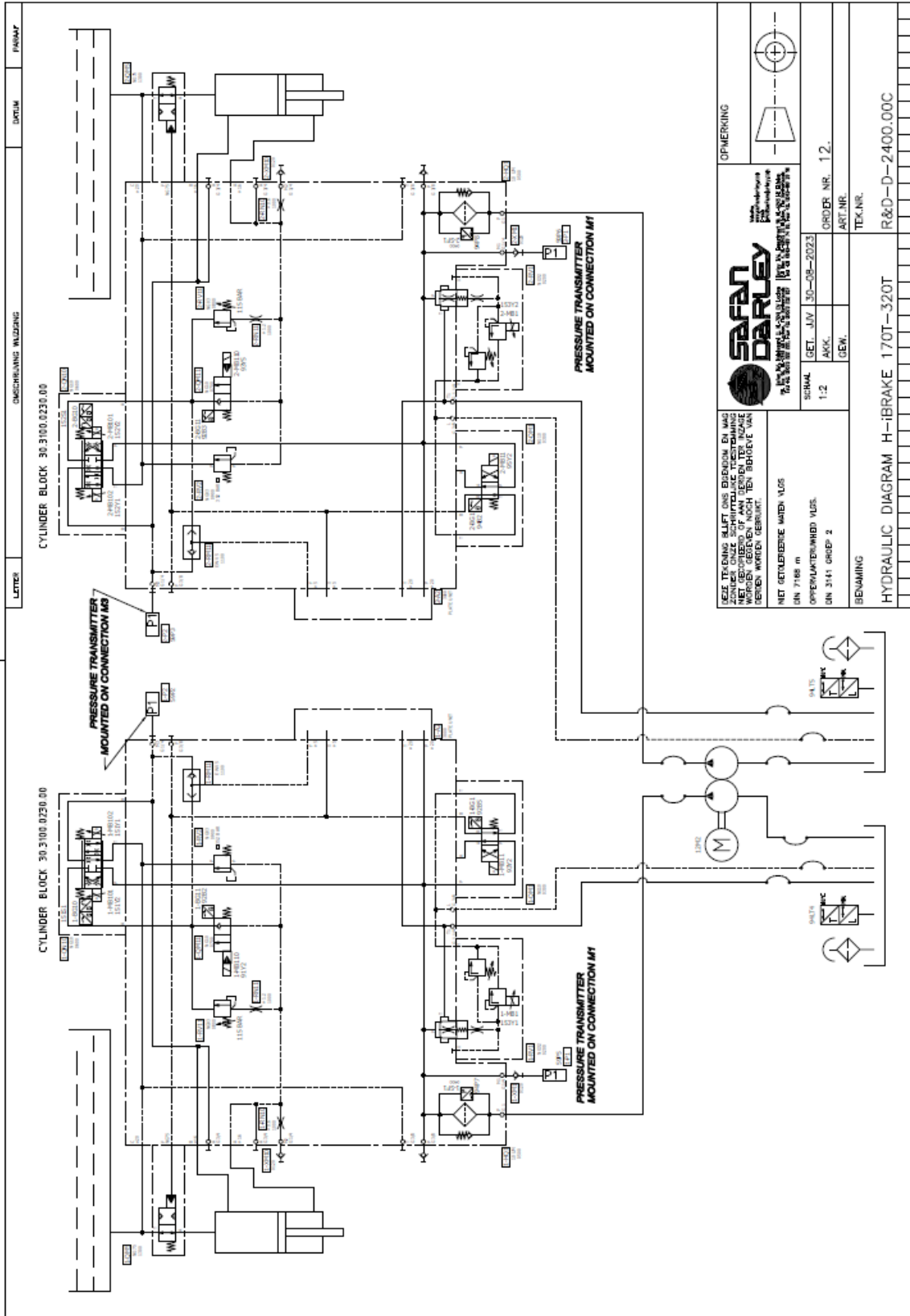
304530000301

Pos.	QTY.	Description	Number	Rev.	Article#
14	1	GELUIDDEMPER 1/8"			
13	1	O-RING 27X7 ORIE27200			
12	1	AFSTRIJKER 17WE3202500-T46N			
11	1	RIMSEAL 17RI1302500-Z52N			
10	2	GUIDING ORKOT C380-25150-2500-A			
9	2	GUIDING 10E/GTP1-25150-2600-A			
8	1	MANCHET 17PT0402600-Z80N			
7	16	SCREW M12x50 12,9 DIN912			210112144
6	1	COVER CYLINDER 320T	250483	A	722032250483
5	1	PLUNGER 320 S350	250482	A	722032250482
4	1	STEPSEAL 17RSK402500-T46N			
3	1	CYLINDER PIVOT BEARING	200235	A	723043202004
2	1	VHR 90-3_4 ED			303047031003
1	1	HOUSING RI 320T S350 NG10	250484	C	722032250484

Surface : DIN ISO 1302		Projection Method	
Geometric Tolerancing : DIN ISO 1101		The reproduction, distribution and utilization of this document as	
Edges of undefined shape : DIN ISO 13715		is prohibited without the express written consent of SAFAN DARLEY. In the event of a	
General tolerances : ISO 2768-mH		payment of damages, all rights reserved in the event of the grant of	
Scale: 1:5	Mass: 586,81 Kg	Material:	Copyright reserved by ISO 16016
Drawn: JIV	Checked:	The reproduction, distribution and utilization of this document as	
Date: 13-6-2023		is prohibited without the express written consent of SAFAN DARLEY. In the event of a	

Description: ASM CYL. 320T S350 NG10 RIGHT CYLINDERS		Revision: C	Format: A3
Article Number: 622032250485		Project: 250485	Rev. Number: 250485
Website: www.safan-darley.com		ID Number: 250485	
Email: info@safan-darley.com			
Kuninkeweg 11, NL-7244 CW Lochem			
Tel: +31 (0)575 222 222			
Fax: +31 (0)575 222 299			
Tel: +31 (0)575 222 222			
Fax: +31 (0)575 222 299			

6.1.4 Appendix 4: Hydraulic plan and spare parts



<p>LET DE TEKENING NIET ALS BESCHRIJVING EN NIET GEDEPONEERD OF AAN VERBODEN TER INZAKE VAN RECHTEN VAN DER DREVEN. ALLE RECHTEN VOORBEHOUDEN. NIET AANVAARDIG VOOR ANDERE TOEWANINGEN.</p>		<p>OPMERKING</p>	
<p>NET GETYPERDE MATERIE ALS DIN 7168 m</p>		<p>SAFAN DARLEY TOEWANINGEN VOORBEHOUDEN</p>	
<p>OPERATIONEN/INHOUD VULS DIN 3141 OEPF 2</p>		<p>SCHAL. 1:2 GET. JUV 30-08-2023</p>	
<p>BENAMING</p>		<p>ORDER NR. 12. ART.NR. TEK.NR.</p>	
<p>HYDRAULIC DIAGRAM H-IBRAKE 170T-320T R&D-D-2400.00C</p>			



HYDRAULIC COMPONENTS

Description	Code	Article number	Number
Cylinder block	EPRAXBASIC54861LSH10B050XXS	30.3100.0230.00	2
Pressure cartridge	Pressure transmitter	30.1200.0087.00	4
Pump	PUMP DOUBLE EIPH3-16CC	30.3063.0361.16	1
Motor 15kW	M55-P160/L4 i550-M22/400-3	30.1311.0070.00	1

-Info Aggregate Hydac Wila Clamping, see PDFs on included USB stick

6.1.5 Appendix 5: Machine Lubrication

Machine lubrication-interval

Interval	Per duration	Opmerking
1x	Month / 200 hours	Which ever comes first
3x	Quarter / 600 hours	Which ever comes first
10x	1 Year / 2000 hours	Which ever comes first
20x	2 Year / 5000 hours	Which ever comes first
30x	3 Year / 7000 hours	Which ever comes first

Lubrication points (interval see upper table)	Amount strokes grease pump	Grease type
Press beam guiding	3 to 4	Gleitmo 805
Spindle nut guiding X-and R-axis	3 to 4	SKF Igmt 2/0.4
Linear guiding support arms	2 to 3	SKF Igmt 2/0.4
*Spindle Wila crowning (crowning in the lower beam)	1 to 2	Molykote DX Paste from dow corning
Linear guiding X-,R- and Z-axis	2 to 3	SKF Igmt 2/0.4

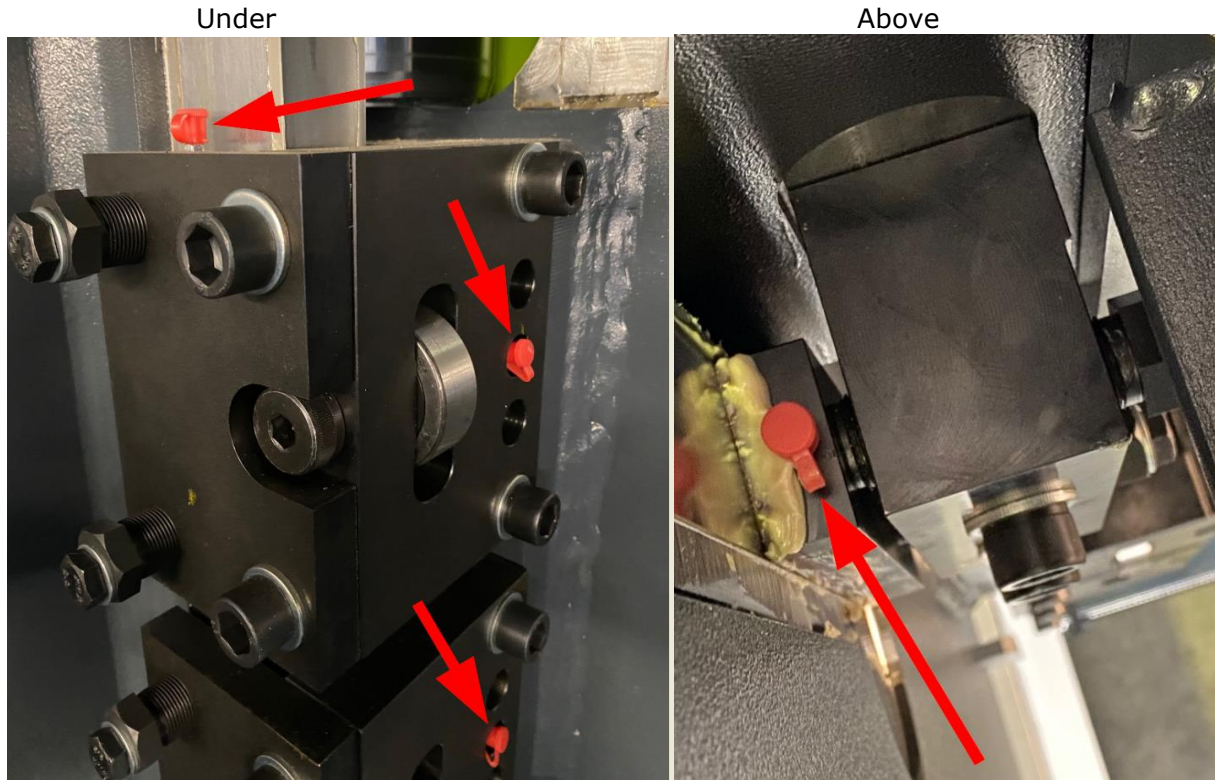
Oil hydraulic system after 2000 hours

Description	Volume
Main hydraulic tank	180 (2x90) liter (Tellus 46)
Hydraulic tank Hydac aggregate tool clamping	3 liter (Tellus 22)

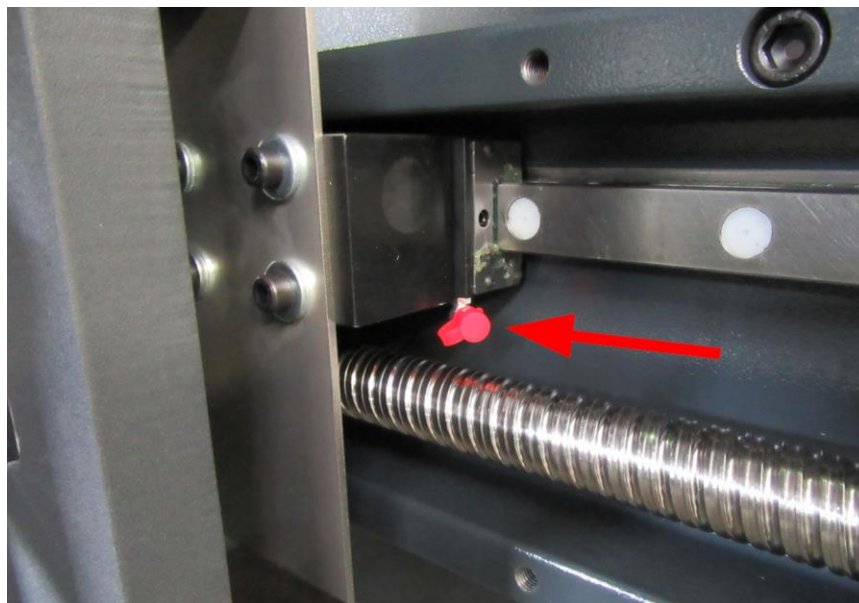
Grease types	Hydraulic oil	Hydr oil Hydac aggregate
<i>Normal Grease points</i>	BP Energol HLP 46	
Gleitmo 585 M	Esso Nuto H 46	
Gleitmo 805	Fina Hydran 46	Shell Tellus 22
SKF Igmt 2/0.4	Mobil VAC HLP 46	
Molykote DX Paste from dow corning	Shell Tellus 46	

Pictures of lubrication points and oil refill and drain points:

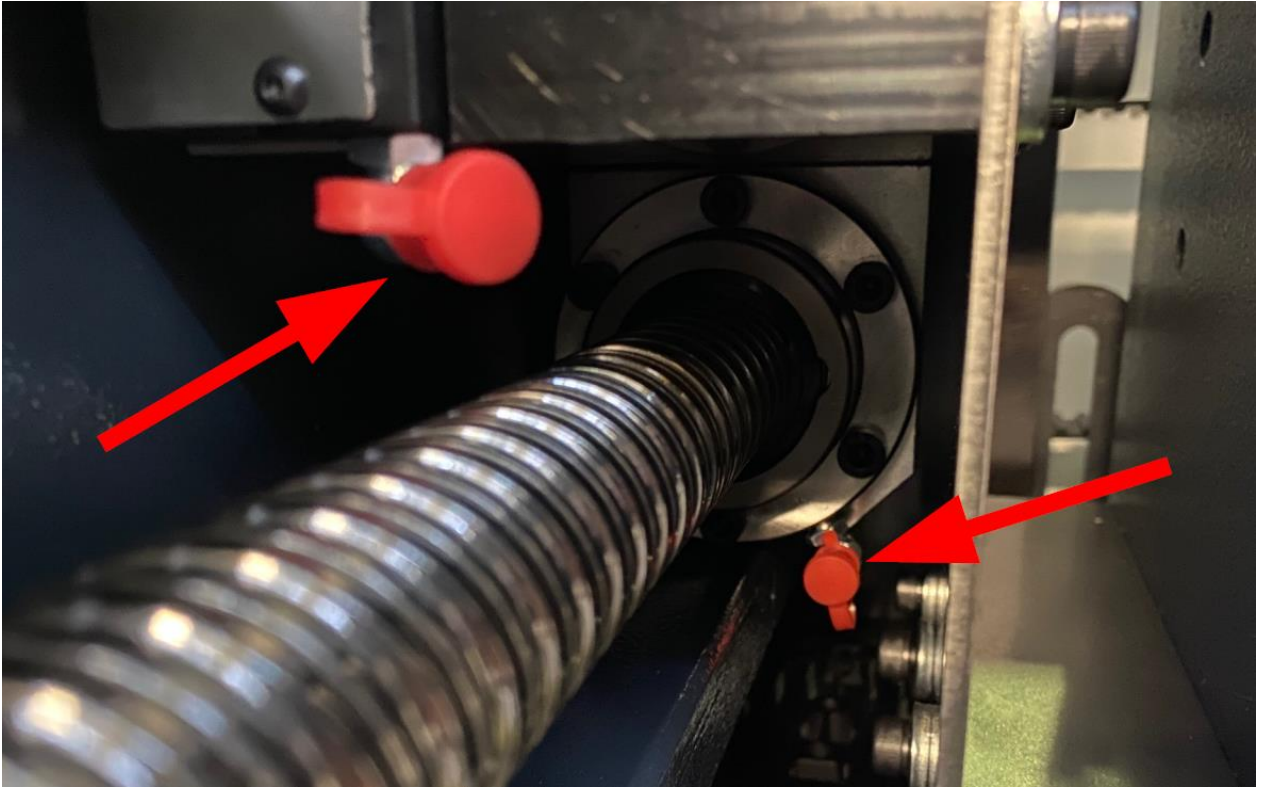
1: Press beam guiding



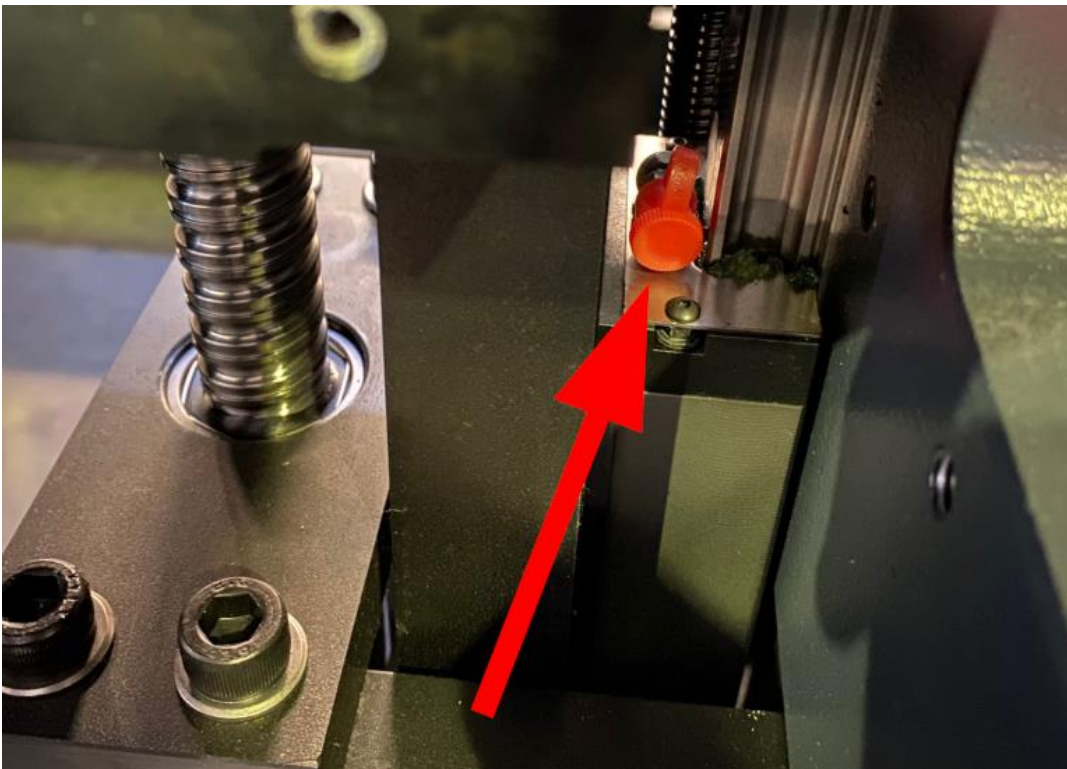
2: Linear guiding X-axis



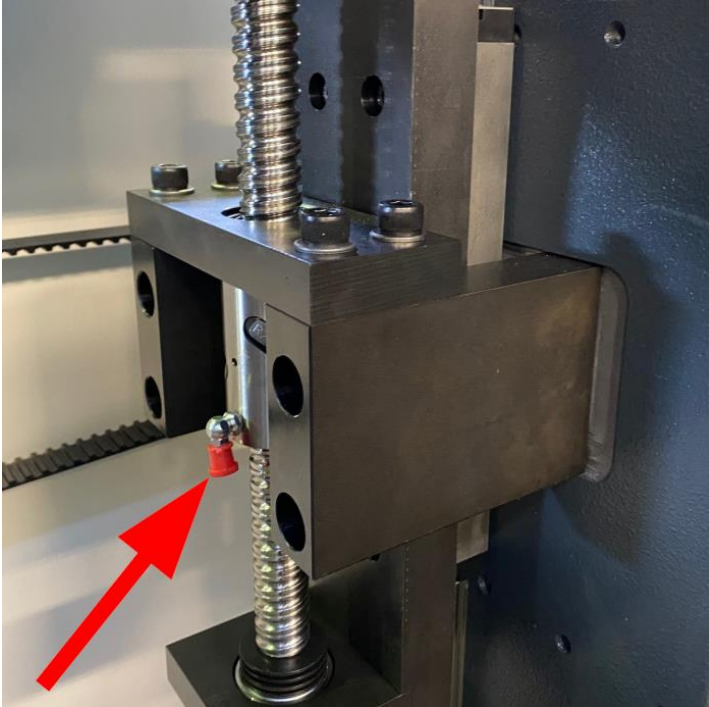
3: Spindl guiding X-axis



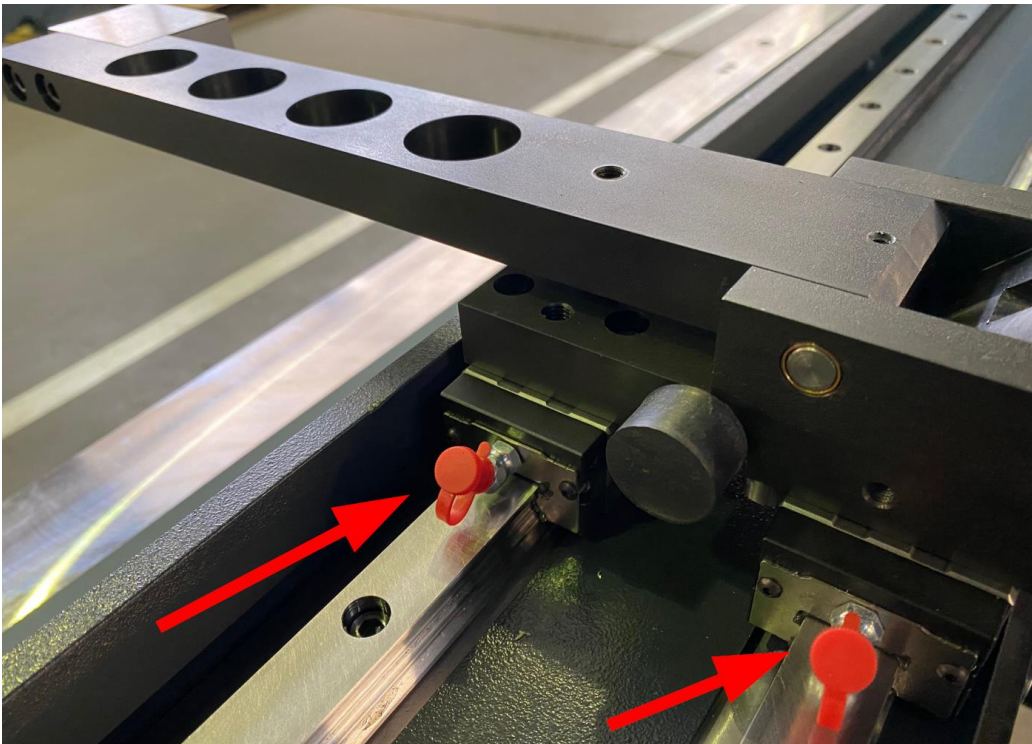
4: Linear guiding R-axis



5: Spindl guiding R-axis



6: Linear guiding Z-axis (backgauge fingers)



7: Oil drain point both hydraulic tanks (back side on machine platform)**8: Oil refill point main both hydraulic tanks**

9: Oil refill and drain point hydraulic tank aggregate tool clamping





H-iBrake 320-3200



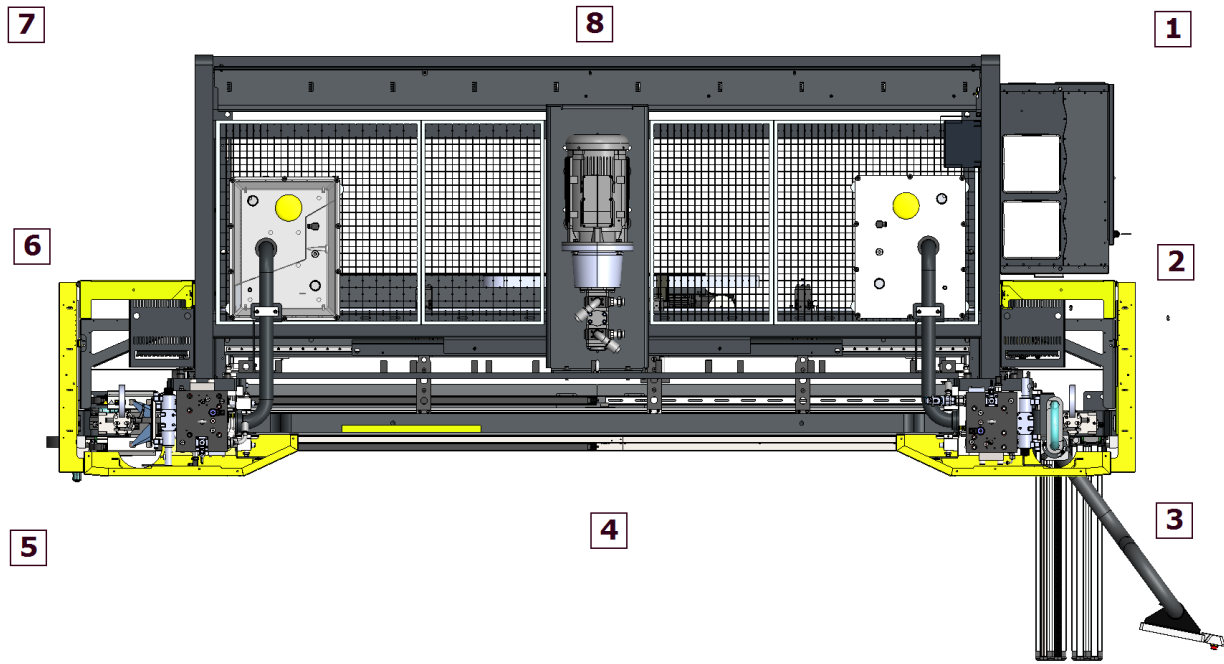
6.1.6 Appendix 6: Electrical diagram

See ring binder in electrical cabinet or on the enclosed USB-stick.

6.1.7 Appendix 7: Noise emission table

Noise emission check

Distance to machine: 1500mm
 Height of measurement: 1600mm
 Sound dimension background: 50.2dB(a)

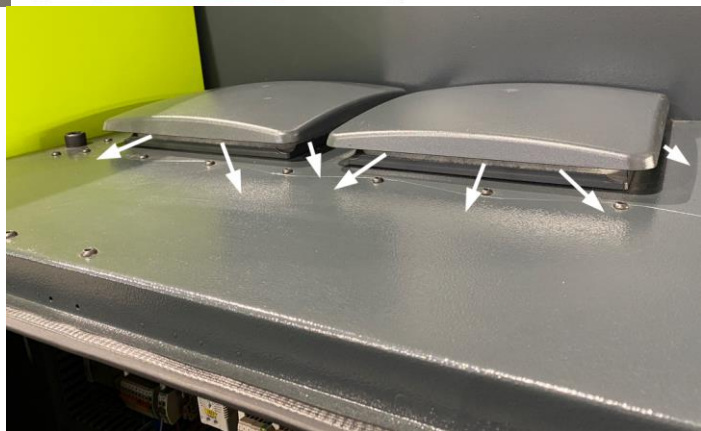


Spot	[dB(a)]
1	71
2	66
3	66
4	67
5	66
6	64
7	70
8	72

6.1.8 Appendix 8: Maintenance of electrical cabinet fan filters

For cooling the electrical cabinets are equipped with a fan and a filter grille which both have a filter membrane inside to avoid dust reaching the inside of the electrical cabinet. Two different sizes of fans are used: 150x150 mm and 250x250 mm and for these the following filters are available as wear part (The main cabinet is always equipped with a 250x250 mm fan).

Description	SafanDarley Art.no.
Filter membrane for fan 250x250 mm (set of 6 pieces)	30.1555.0000.02
Filter membrane for fan 150x150 mm (set of 6 pieces)	30.1555.0000.07



Notes:

- 1) The filter membrane can be replaced from the outside and without the need for tools.
- 2) These filters must be checked, cleaned and if necessary exchanged on a regular base depending on the amount of dust in the surrounding area of the machine. When the filters get polluted too much, the dust will be blown into the electrical cabinet and cause a layer of dust on the out- and inside of the electronic parts. Because the dust mostly also contains metal particles this can cause a shortcircuit inside the electronic parts. When the filters are not cleaned properly and dust gets inside the electrical cabinet this also will influence warranty claims (if applicable) of broken parts covered with dust.

- 3) As this dust usually contains tiny metal particles, it can cause short circuits in electronic components. If the filter mats are not regularly and carefully cleaned or replaced and dust reaches the inside of the enclosure, this will also affect any warranty claims (if applicable) for damaged dust-covered parts.



- 4) Two filter mats from a set of 6 are required for an electrical enclosure. One filter mat for the filter fan (bottom side of the electrical enclosure) and one for the ventilation grille (top side of the electrical enclosure).

- 5) The filter mats can be washed 8-10 times, depending on the amount of dirt.

- 6) It is also important that the temperature switch in the control cabinet for switching the fan on and off is set to the correct temperature. As standard, the temperature switch must be set to 35°C. If this switch is set so that the fan runs continuously, the filter mats will become dirty even faster (too fast).



6.1.9 Appendix 9: Explanatory wordlist

Press beam

This is the moving part of the press brake to which punches can be fitted. The punches can be fixed into position in the press beam by means of clamping screws. The two main cylinders ensure that the press beam makes a vertical movement.

Back gauge

The gauge against which the plate which is to be bent is positioned when bending operations are to be carried out. This back gauge can be adjusted electrically (CNC).

Main cylinder

The main cylinders are to be found on both of the machine's side standards. The main cylinders push the press beam downwards for the bending movement and then lift the beam again into the starting position.

Console

Protruding supporting arms onto which the plate is to be laid.

Speed Changeover Point (SCP)

Position of the punch point relative to top of plate where the movement of rapid lowering changes to the safe pressing speed of 10mm/sec.

CNC

Computer Numerical Control: the manner of control by means of a computer with feedback of the present position.

Throat depth

A recess in the side standards of the frame. The size of this recess makes it possible to handle products over the entire width of the machine.