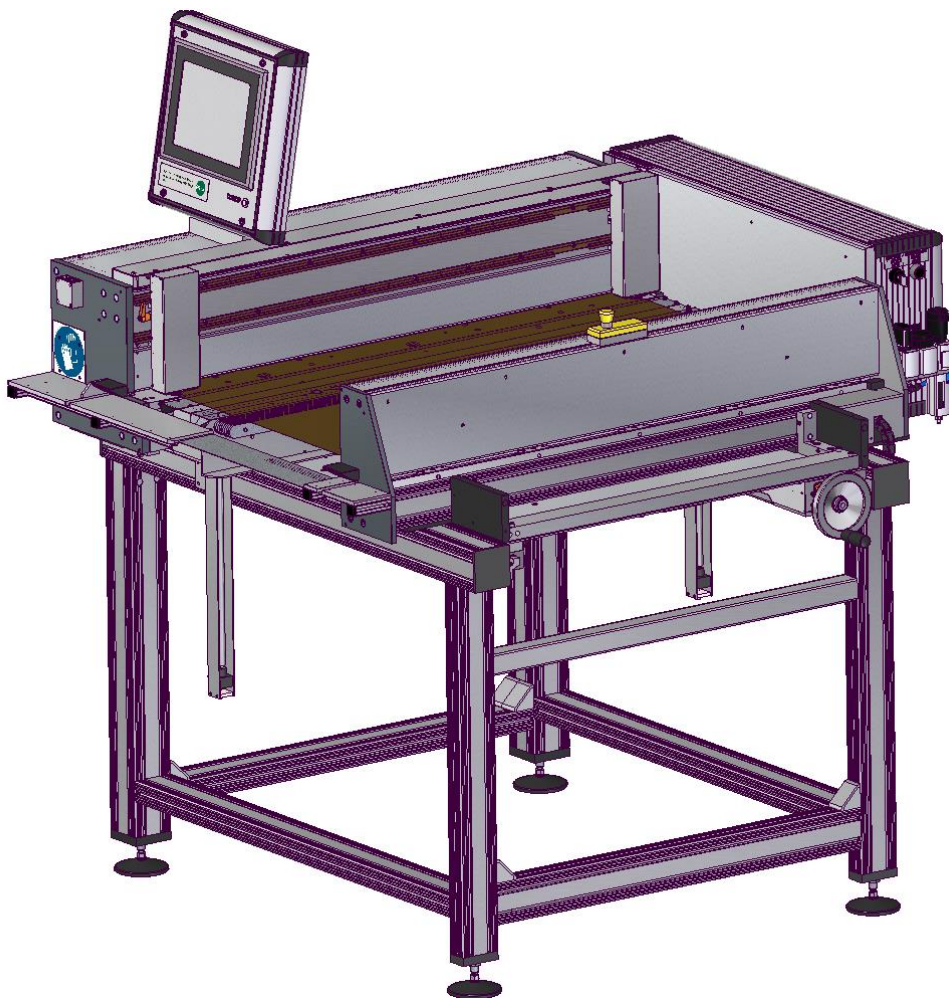




Operating Manual

ORIGINAL INSTRUCTIONS IN ENGLISH LANGUAGE

AUTOMATIC PRINTING PLATE BENDER APB



PITSID Polygraphische innovative Technik Leipzig GmbH

Mommsenstrasse 2

04329 Leipzig

Germany

Telephone +49 341 259 42 - 0

Telefax +49 341 259 42 - 99

Subject to technical modifications



CONTENTS

1	GENERAL INFORMATION	4
2	SAFETY INSTRUCTIONS	5
3	TECHNICAL DATA.....	6
3.1	Range of Functions	6
3.2	Dimensions	7
3.3	Transport und Installation of the APB	8
3.4	Operating Conditions.....	10
3.5	Copyrights / Protective Rights	11
3.6	EC Conformity	11
4	CONNECTION TO THE SUPPLY NETWORKS / INTERFACES	12
4.1	Electrical Connection.....	12
4.2	Pneumatic Connection	12
4.3	Network Connection (optional)	13
5	AUTOMATIC PRINTING PLATE BENDER COMPONENTS	13
5.1	Bending Module A (120°)	13
5.2	Bending Module B (60°) with Format Adjustment Unit	14
5.3	Positioning Module	15
5.4	Operating and Display Module	16
5.5	Control Unit	16
5.6	Software	17
5.7	Documentation	17
5.8	Measuring Elements.....	17
6	INSPECTING THE DEFAULT MECHANICAL SETTINGS.....	18
7	OPERATING THE PRINTING PLATE POSITIONING SYSTEM.....	18
7.1	Operating Modes.....	18
7.1.1	Automatic Mode	18
7.1.2	Emergency Mode.....	18
7.2	Powering On and Powering Off (Automatic Mode)	20
7.2.1	Powering On	20
7.2.2	Powering Off	21
7.2.3	Automatic Power Off	21
7.3	Setting the Printing Plate Width	22
7.4	Setting the Format Length	24
7.5	Automatically Bending Printing Plates	25
7.5.1	Inserting a Printing Plate	25
7.5.2	Positioning and Bending	27
7.5.3	Removing a Printing Plate.....	29
7.6	Software Settings	29
7.6.1	In General.....	29
7.6.2	“Basics” Menu.....	29



7.6.3	“Adjustment” Menu.....	30
7.7	User Prompts	33
7.7.1	In General.....	33
7.7.2	Overview of the Display Prompts	33
7.8	Warranty	35
8	MAINTENANCE AND SERVICE INFORMATION.....	36
8.1	Maintenance and Maintenance Intervals	36
8.2	Replacement Parts.....	37
9	TECHNICAL DATA.....	38
10	APPENDIX	39
10.1	Appendix 1: Placement of the Measuring Elements.....	39
10.2	Appendix 2: Declaration of Conformity	40
10.3	Appendix 3: Plate Bender Transport Packaging	41
10.4	Appendix 4: Removing the Transport Securing Devices	42
10.5	Appendix 5: Realignment of the Printing Plate Bender	43
10.6	Appendix 6: Readjusting the Bending Parameters.....	44



1 GENERAL INFORMATION

The intended use of the Automatic Printing Plate Bender is described in this documentation. **The Operating Manual is to be placed in a central place so that it is easily accessible at any time to the operating personnel.**

Disclaimer

Any deviating use or use beyond that which is stated in the operating manual is considered not being in compliance with its intended use. This also applies to any changes, bypasses or any disabling of devices on the machine which provide for the proper functionality, unrestricted use as well as the active or passive safety mechanisms on the machine.

The manufacturer is free from any liabilities due to improper use of the bender and the liability will then be transferred to the operator.




Additionally:

The country-specific safety regulations must be observed.

The use of the device may only be made by trained, authorised, and qualified personnel. Responsibilities and distribution of tasks need to be clearly defined and controlled.

Important!

Information that deals with your own safety and guarantees a proper use of your system are identified by symbols. The symbols have the following meanings:








	ATTENTION! Potential shock hazard due to high voltage.
	ATTENTION! Indication of a danger for the positioning device and a possible consequential hazard to human health.
	Important information about using the device.








2 SAFETY INSTRUCTIONS

The Automatic Printing Plate Bender contains electrical components that belong to Protection Class I. This concerns the control unit and a number of components which are included therein. This means: All operating metallic parts that are not under voltage are connected to a ground conductor in case they are accidentally placed under voltage.

All sensors and actuators that are connected to the control unit are supplied with a Safety Extra-Low Voltage of 24 VDC from the PC power supply.

	Only open the covers and panels where special tools are not necessary and can be done by hand. Behind these covers could be shear and crushing points as well as parts which are under voltage.
	The control unit does not support any relevant safety functional processes. The safety of the operating personnel during operation of the device is assured through constructed mechanical measures (covers) for all dangerous pneumatic and electromotive movements. Only in this way is it possible to assure the possibility of an emergency stop, which completely shuts down all electronic controls.
	The control unit contains pneumatic components. Components that are under pressure can cause personal or material damage. Therefore, turn off the compressed air supply before installation or maintenance and vent the air from the system preferably from the service unit.
	When opening the covers or removing components in the electrical control unit, components under voltage can be exposed. Connection points can also be under voltage.
	Opening the control unit can only be carried out by qualified specialists. It needs to be ensured that when doing so, the safety of the device is not compromised. This applies particularly to the ground conductors, the covers or anything similar.
	Before opening the control unit and when handling system components, it is absolutely necessary to remove the power cable from the electrical supply so that the system is not under voltage.
	When it is assumed that a safe operation of the Automatic Printing Plate Bender is not possible, the device must be shut down and not put into operation. Make sure that the system cannot be accidentally powered on (e.g. lock on the main switch). It can be assumed that a safe operation is not possible when: <ul style="list-style-type: none"> • The device has visible damages • A repeating fuse fault occurs • The device does not work for unrecognisable reasons • After a long storage time period under unfavourable conditions • After rough handling during transport • After liquids have entered the system



	Only connect the Automatic Printing Plate Bender to a properly grounded power outlet. Otherwise, there is a danger of fire or electrical shock in case of device errors.
	Operate the Automatic Printing Plate Bender only in explosion-free environments. Please observe the operating conditions (see Section 3.4).
	If the Automatic Printing Plate Bender is operated in a way that does not comply with this operating manual, the hazard protections which are provided by the device may be compromised.
	Please wear safety gloves when operating the Printing Plate Bender due to the potential risk of injury caused by the sharp edges of the printing plate when inserting and removing the plate from the device.
	On the PC motherboard in the control unit is a CR2032-JS2 lithium battery which supports the system clock. This battery is not to be replaced by the operator.

3 TECHNICAL DATA

3.1 RANGE OF FUNCTIONS

The Automatic Printing Plate Bender APB is a device for bending printing plates on two opposite sides. The bending length and angle are non-adjustable and cannot be changed by the customer. The values are shown in the following table:

	Bending length	Bending angle	Bending radius
Leading edge	7 (+0/-0.5) mm	60°	0.15 mm up to max. 0.2 mm
Trailing edge	7 (+0/-0.5) mm	120°	0.15 mm up to max. 0.2 mm

The Printing Plate Bender is equipped with a video-based positioning system. After manually inserting the printing plate and starting automatic mode, the position of the printing image is calculated by using two video cameras. For this, specially developed measuring elements are analysed with a high precision. These elements are placed outside of the printing area on both sides of the printing plate in the printing direction at a defined position relative to the printing image. Using complex software, positional commands are calculated and are given to three positional driving motors. This makes it possible to make adjustments in X and Y direction as well making angle adjustments. Using a cyclical succession of measurements and adjustments, an iterative convergence to the optimal bending position is carried out.

Positioning range in X1, X2 and Y direction	± 1.5 mm
Resulting maximum angle adjustment	< ± 0.5°
Positioning accuracy	± 2 µm

During the complete measurement and adjustment process, the printing plate is fixed in position with suction cups. Before each measurement, the printing plate is pressed onto the supporting table on both sides by pneumatically-operated pressing bars. After a successful positioning process, the plate remains fastened and the automatic bending process takes place. The removal of the bent printing plate is then carried out manually.



Aluminium printing plates with thicknesses of maximum 0.3 mm may be used. It should be noted that only conventional printing plates are to be used. So-called process-free printing plates, where the exposed measuring elements are barely, if at all, visible, cannot be detected and cannot be automatically positioned.

Besides the automatic mode, a manual emergency mode is also possible. To use this, the electrical connection to the control unit must be disconnected. After a mechanical conversion of the end stops, bending is made possible by pneumatic switches which press and then bend the printing plate.

3.2 DIMENSIONS

The Automatic Printing Plate Bender is intended to bend three different printing plate widths:

Plate width	Distance between measuring elements		Printing width
	Centre to centre alignment	Distance from leading edge	Maximum
520 (530 *) mm	510 (520 ") mm	83.25 mm	500 (510 *) mm
860 mm	850 mm	83.25 mm	840 mm
1060 (1090 **) mm	1050 (1080 **) mm	83.25 mm	1040 (1070 **) mm

* Optional

** Large size format

Plate length		Print length	
Minimum	Maximum	Minimum	Maximum
420 mm	777 mm	406.4 mm (16")	762 mm (30")
Large size format:			
420 mm	929.4 mm	406.4 mm (16")	914.4 mm (36")

The following precision can be achieved:

Parallelism from the printing marks to the bending edge	0.010 mm
Inner length between the bent edges (421 to 763 (large size format to 930) mm)	±0.05mm

Depending on the plate width, the linearly adjustable video system is fixed in the intended position above the relevant reference measuring element. This completes the set-up of the plate width. The plate length can be chosen from the entry menu and the positional movement is carried out by means of a motor driven by the control unit.

The supporting table for the printing plate is at a height of about 976 mm. The top edge of the display is 1531 mm above the floor. In this way, ergonomic working conditions are achieved (see

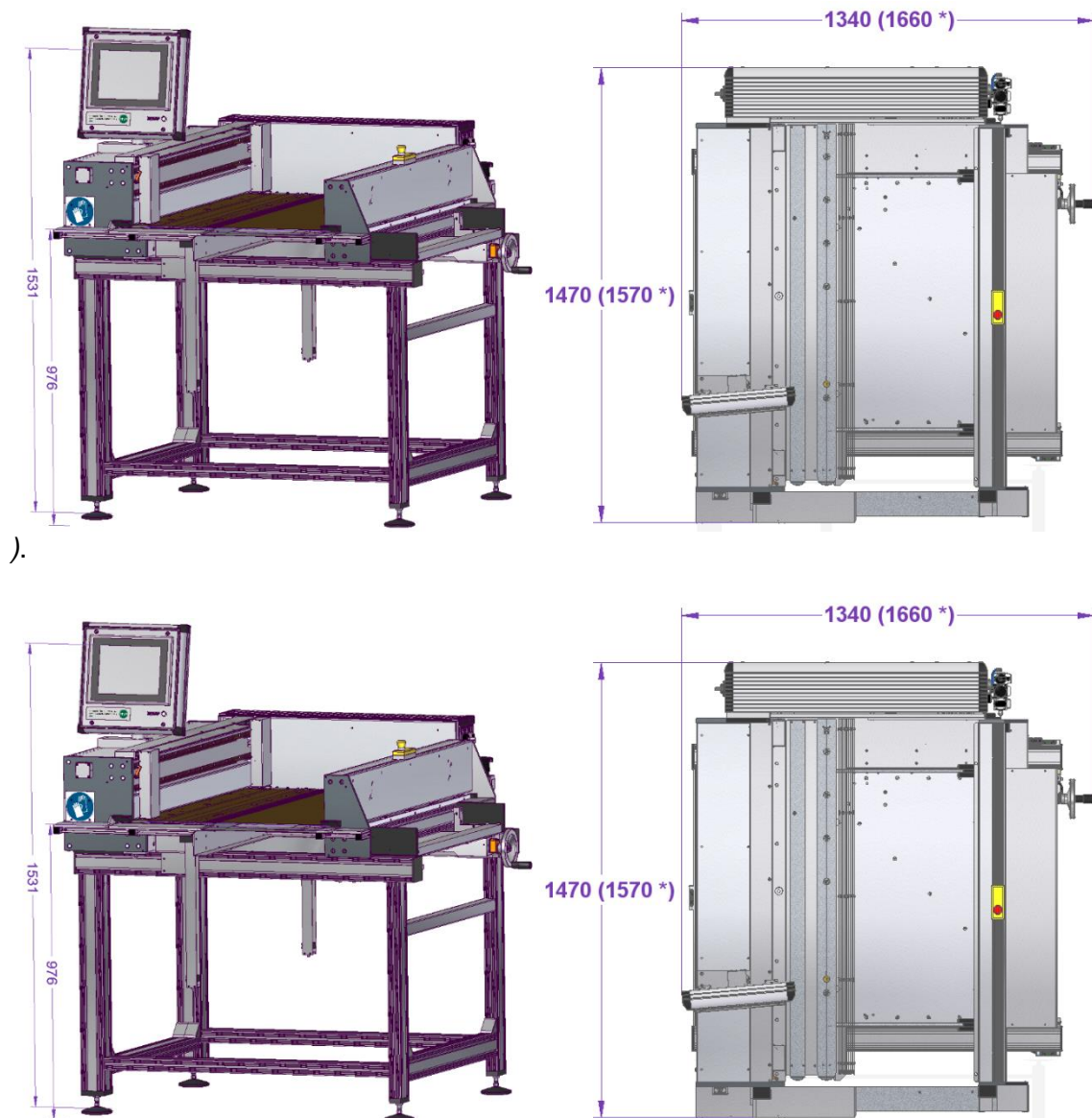


Figure 1 – Main dimensions (* dimensions for large size format)

3.3 TRANSPORT UND INSTALLATION OF THE APB


The Printing Plate Bender is only allowed to be transported and installed by instructed personnel. Forklifts and pallet jacks can be used as means of transport.

Gross mass (incl. transport crate)	400 (large size format 480) kg
Net mass	200 (large size format 230) kg
Gross dimensions	1800 mm (D) x 1600 mm (W) x 1700 mm (H) (large size format 2000 mm (D) x 1900 mm (W) x 1700 mm (H))
Net dimensions	1470 mm (D) x 1340 mm (W) x 1600 mm (H) (large size format 1570 mm (D) x 1660 mm (W) x 1600 mm (H))

The device is delivered in a transport crate (export variant IPPC-Standard ISPM 15). The wood has been heat-treated and the crate is non-stackable.


Packing information about the bender in the transport crate is documented in Appendix 3.



	<p>Lifting the bender is only permissible underneath the reinforced cross struts (see <i>Figure 2</i>).</p>
---	---

When lifting the Printing Plate Bender out of the transport crate, the contact area of the forks used should have an anti-slip surface.

The plate length is set to the maximum format during transport in order to create an optimum centre of gravity.

	<p>Attention! The centre of gravity of the Automatic Printing Plate Bender is not in the middle (see <i>Figure 2</i>). Always position the centre of gravity of the device closest to the front wheels of the forklift. Additionally, set to the maximum format.</p>
---	--

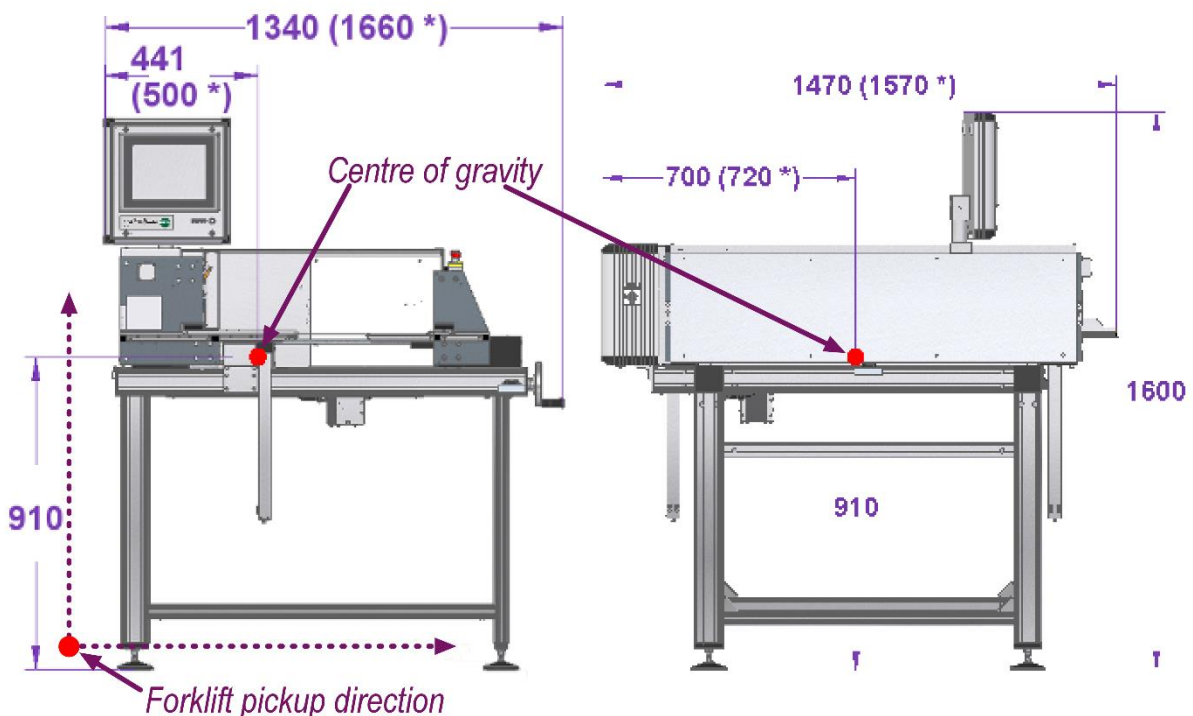


Figure 2 – Pickup point for transport, centre of gravity indication (* dimensions for large size format)

The Automatic Printing Plate Bender has been intended to be installed on a level surface. The device mass of approx. 200 kg (large size format 230 kg) as well as the necessary base area of approx. 1500mm (D) x 1400mm (W) (large size format 1600mm (D) x 1700mm (W)) are to be taken into account when placing, as well as keeping a corridor free in order to be able to operate the bender on three sides.

The operating panel is lowered during transport in the crate. During installation, the optimum placement setting can be made using the two screws on the back of the operating panel (see *Figure 9*).

Please note that special transport securing devices have been fixed inside the unit. These protect the movable components of the device from damage during transport.



	<p>Remove the transport securing devices inside of the unit after the final position of the unit is reached based on the instructions in Appendix 4 of this operating manual. These securing devices need to be installed again before any renewed transportation.</p>
--	--

Choose an installation position of the Plate Bender so that it can be accessed from three sides at all times. For any service work, the control unit side also needs to be accessible without having to move the bender.

	<p>The device is to be placed in such a way so that the operation of the electrical isolating device (main switch) is accessible at all times without any obstruction.</p>
	<p>The device is to be placed in such a way so that access to the compressed air connection unit is always ensured.</p>

In order to control the general alignment of the device, three bubble levels have been placed on different areas of the device. Their position is shown in Figure 3. These levels are to be brought to their level position using the adjustable feet. The levels are not necessarily setup to reach their absolute horizontal position but rather they are set to the reference level position in which the bending device has been measured. After this, the feet need to be checked to make sure that they all have secure floor contact. If this is not the case, the device needs to be repositioned according to Appendix 5.

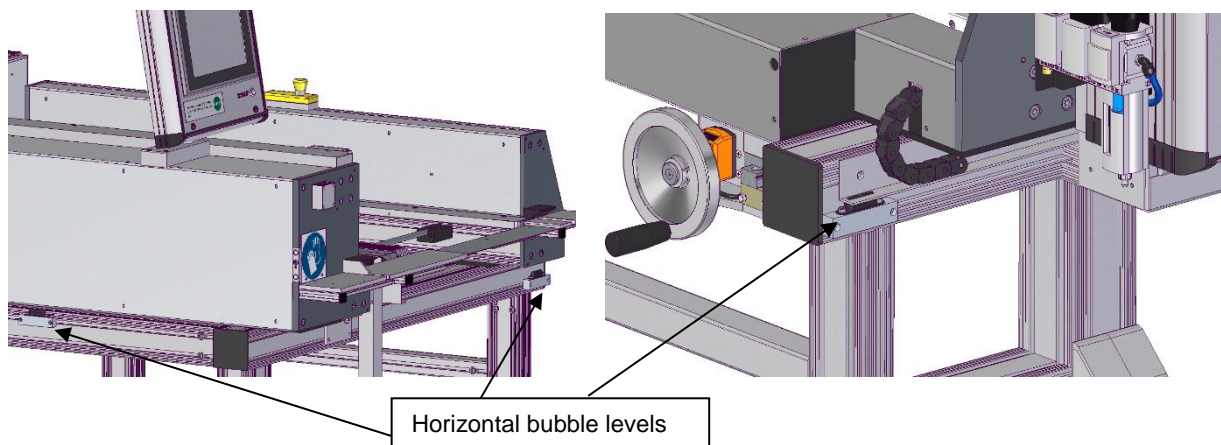


Figure 3 – Position of the bubble levels

After completing the height adjustment, the feet positions need to be secured using the locking nut. The final control of the Plate Bender precision will be determined after installation using a controlled bending process or controlled by using a level over the whole format area.

3.4 OPERATING CONDITIONS

The Automatic Printing Plate Bender is constructed for continuous operation.



	<p>The Automatic Printing Plate Bender operates at a temperature range of +5 to +30 °C. In the interest of stable and reproducible precise measurements, a constant environmental temperature of 20 to 25 °C should be kept. This also means avoiding temperature changes, for example by air drafts. For the same reason, the relative air humidity should lie in a range of 40 to 70 % (the limit for the device is < 85 % rel. humidity). The operation in explosion-prone areas is not permitted (flammable gases, steam or solvents). During operation, impacts ≥ 5 G are not permitted.</p>
--	--

For transport and storage, the following operating conditions apply:

Ambient temperature: -10 °C to +50 °C

Rel. humidity: 30 % to 85 %

Impact stress: ≤ 25 G

	<p>Please do not operate the bending device after it has undergone drastic temperature changes (e.g. after transport). Only begin operation until the temperature of the device has adapted to the environmental temperature. This allows time for any condensation to be evaporated and ensures an exact measurement and printing plate positioning since this is only possible under stable temperature conditions.</p>
--	---

3.5 COPYRIGHTS / PROTECTIVE RIGHTS

Patent applications for the European area and Germany have been applied for by SID GmbH. These apply to the protective rights of the positioning system and of the design of the measuring elements as an integral component of the Automatic Printing Plate Bender.

The positioning system software is protected by copyright.

The copyright protections of the integrated components in the positioning system, including the standard software, lie with their respective manufacturer.

The names of the integrated components in the positioning system, including the standard software, are as a rule registered trademarks of the related manufacturers.

3.6 EC CONFORMITY

The printing plate positioning system conforms to the appropriate directives. The declaration of conformity is attached in Appendix 2.



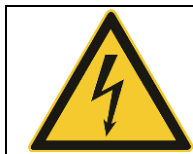
4 CONNECTION TO THE SUPPLY NETWORKS / INTERFACES

4.1 ELECTRICAL CONNECTION

The Automatic Printing Plate Bender is designed to be operated with an AC voltage supply. The following input voltage is permitted:

AC Supply: 100-240V / 50/60Hz

The power connection is made by connecting the power cable, which is securely connected inside the control unit, to a shockproof power outlet protected with a 10A fuse.



Before inserting the power cable of the Printing Plate Bender into a power outlet, the rated voltage and the fuses of the respective power supplies should be checked to be sure that the listed data of the power outlet are correct. Only use a properly grounded power outlet.

The Automatic Printing Plate Bender has a lockable main switch. The device can be shut down during long operation breaks and can be locked-out with a padlock to protect it from being powered on. The device is voltage-free only when the power cable has been disconnected from the socket.



Shutting down the integrated PC does not disconnect the Printing Plate Bender from the power supply. Use the main switch.

During AC voltage supply, a maximum voltage interruption of 20 ms is permissible. A time of more than 1 sec needs to lie between two successive interruptions. Voltage drops are not allowed to exceed 20 % of the peak voltage of the power supply for more than one cycle. A time of more than 1 sec needs to be between successive voltage drops.

4.2 PNEUMATIC CONNECTION

The Automatic Printing Plate bender needs compressed air for operation. The following compressed air supply values are needed:

Oil-free compressed air 6 bar with max. 100 NI/min

The Automatic Printing Plate Bender is integrated with a pneumatic service unit with a closable main shut-off valve, a pressure build-up valve and a closable pressure control valve including a pressure gauge, a moisture separator as well as an air filter. The maximum supply pressure at the inlet of the service unit is not allowed to exceed 10 bar. With the help of the pressure control valve (pull up to unlock the control knob), **6 bar** is set as the **operating pressure** (press down to lock the control knob). The external compressed air connection is prepared for a polyurethane compressed air tube with a diameter of 6 mm. Alternatively, a compressed air tube connection piece plus a clamp is provided. The compressed air connector is labelled as follows (see Figure 11):

Druckluft / COMPRESSED AIR / 6bar - 10bar



4.3 NETWORK CONNECTION (OPTIONAL)

It is possible to connect the Plate Bender either to the internet or to an internal company network by means of a network connection jack (RJ45) found underneath the control unit.

RJ45 connection jack for network connectivity

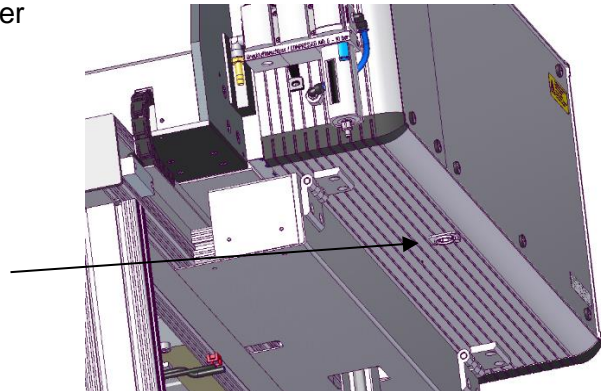


Figure 4 - RJ45 connection

5 AUTOMATIC PRINTING PLATE BENDER COMPONENTS

5.1 BENDING MODULE A (120°)

The bending module A is a fixed bending module with a bending angle of 120°. Reference measuring elements are integrated into the supporting table of the bending module and are needed to calibrate the system.

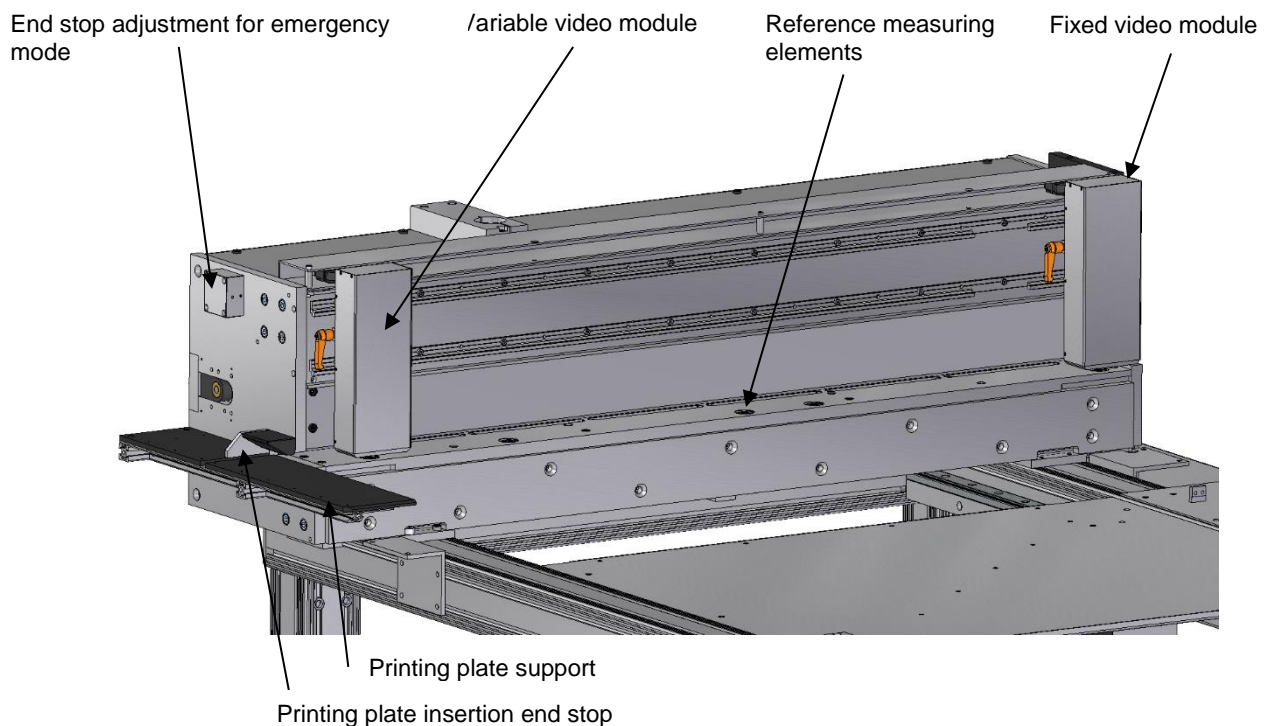


Figure 5 – Bending module A

They also determine the video module positions for the different printing plate widths. The video modules consist of a video camera with a lens, measuring field illumination and a plate pressure peg. They are positioned on a movable crossbeam, where one video module is fixed and the other can be variably adjusted according to the plate widths.

End stops for the printing plates are integrated into bending module A and can be set to a distance of 7 mm or 8 mm from the bending edge. By default, the distance is set to 8 mm for automatic mode in order to have enough space for printing plate positioning process. The end stops are shifted only when using emergency mode (see Section 7.1.2).



The pressing and the bending of the printing plate take place pneumatically. One of the four pneumatic cylinders used for lowering the pressing bars is equipped with a pneumatic positional limit switch which only allows the bending process to take place when the fixation of the printing plate is verified.

The bending module A is completely enclosed with the exception of a small insertion slot for the printing plate. This ensures that no parts of the body can be crushed or pinched.

5.2 BENDING MODULE B (60°) WITH FORMAT ADJUSTMENT UNIT

The bending module B is positioned directly opposite that of bending module A and its position is adjustable depending on the format length. This parallel movement is made possible by using motors which are activated by entries made on the display module. In order to avoid any dangers during the motorised movement, the movement is limited to a maximum speed of 20 mm/s. Pinching and shearing points have been safely prevented by constructive measures. Furthermore, it is not necessary to carry out any operational actions in the movement area. The maximum feeding force is also not larger than 100 N. The moving module can be safely stopped by using the emergency stop button.

Manually moving bending module B is possible by using the hand wheel (e.g. during emergency mode). Use of the hand wheel should only be made when the control unit is turned off. To engage the wheel for movement, pull the hand wheel while simultaneously turning it. Even when the control unit is powered on, using the hand wheel by mistake will not cause any danger. The hand wheel usage is registered by the control unit and no competing movements will be initiated. Using the hand wheel while the automatic movement is running is not dangerous because the motor will be stopped by the spindle on the hand wheel (limited torque of the motor). In addition, the hand wheel sensor blocks the motor drive electronically.

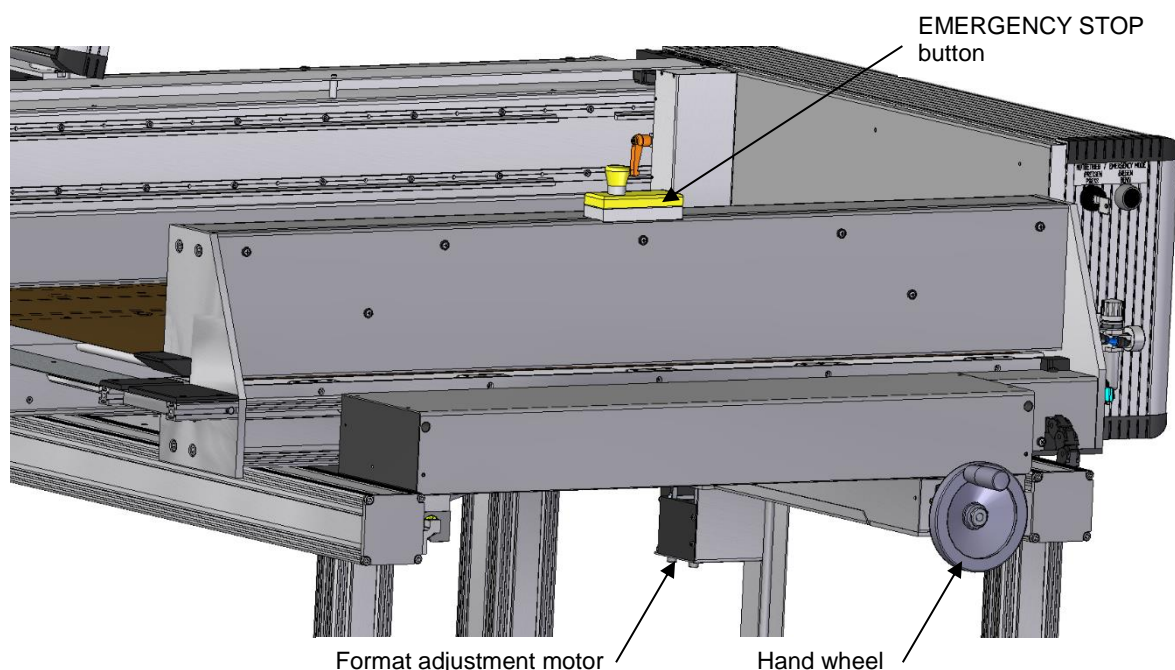


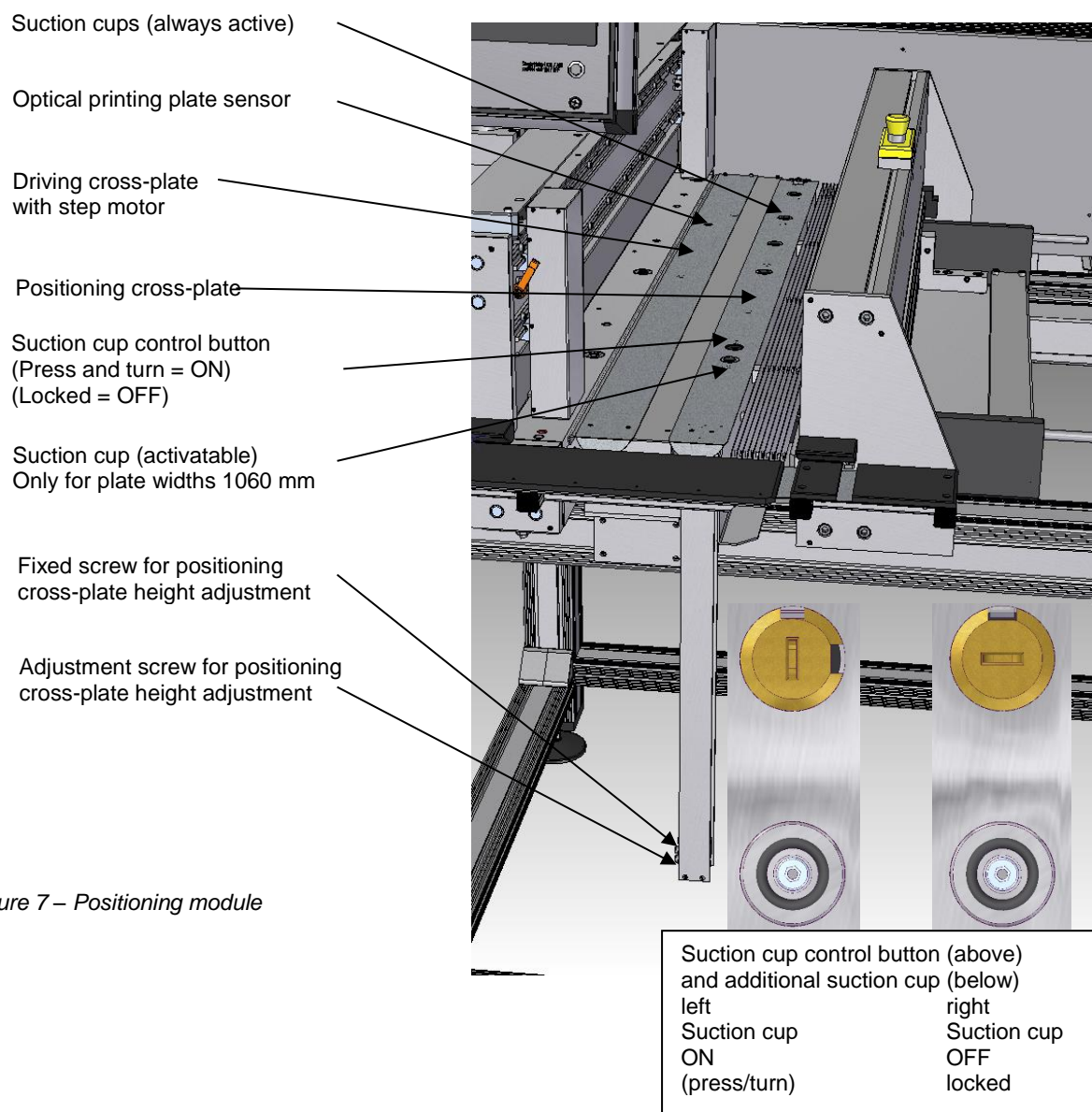
Figure 6 – Bending module B



5.3 POSITIONING MODULE

The printing plate is adjusted to an optimal bending position with the positioning module by using a measurement and adjustment algorithm. The module consists of a movable positioning cross-plate which is connected to a fixed driving cross-plate via a coupling rod. The adjustment requirements are realised using three step motors. The positioning cross-plate is outfitted with several suction cups which hold the printing plate in place during the positioning process. One of the suction cups can be manually activated for plate widths of 860 mm or more. To do this, the control button next to the suction cup needs to be pressed into the cross-plate and turned (with a screwdriver if needed). The vacuum pump is also located in the driving unit and a vacuum switch monitors the suction process. A printing plate sensor recognises when a printing plate is present.

The positioning cross-plate floats on rods which make it possible to create movement in all directions. At the bottom of these support rods, it may be necessary to adjust the height of the positioning cross-plate in order to allow for the printing plate surface to be flat and even.





5.4 OPERATING AND DISPLAY MODULE

The operating and display module is fixed on bending module A. It consists of:

- Touchscreen operating panel
- "control unit ON/OFF" button

The electrical control unit (industrial PC) is powered on and off with a button. Any further operations are carried out on the 10.4" touchscreen.

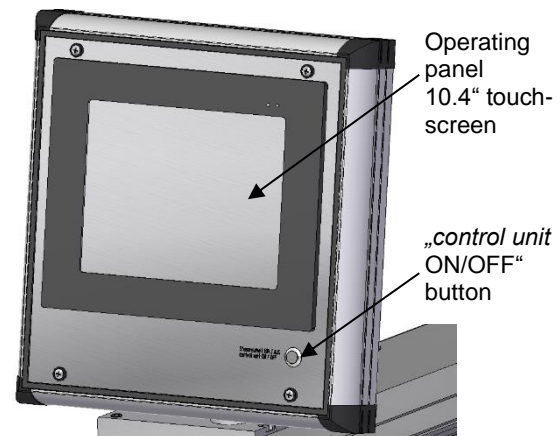


Figure 8 – Operating and display module; display side

The tilt and rotation of the operating and display module can be adjusted to a certain point by fixed screws located on the back side of the module.

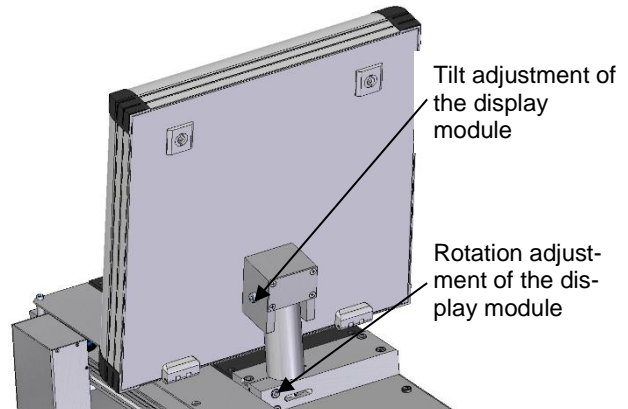


Figure 9 – Operating and display module; back side

5.5 CONTROL UNIT

The control unit consists of the electric/electronic and pneumatic parts which are separated from each other by a partition.

The complete control unit can be pivoted forwards. After removing the protective covering on the backside of the unit, all electrical connections running from the control box to the device are accessible. The fixed screw for the control box is not readily accessible and is integrated inside the control box (top right corner). The following main components are integrated into the control unit:

- Electronic control; complete with:
 - Industrial PC made from single components (motherboard; hard drive; power supply)
 - Electrical input with main switch
 - Signal processing circuit board
 - Step motor drive circuit board
 - Safety relays

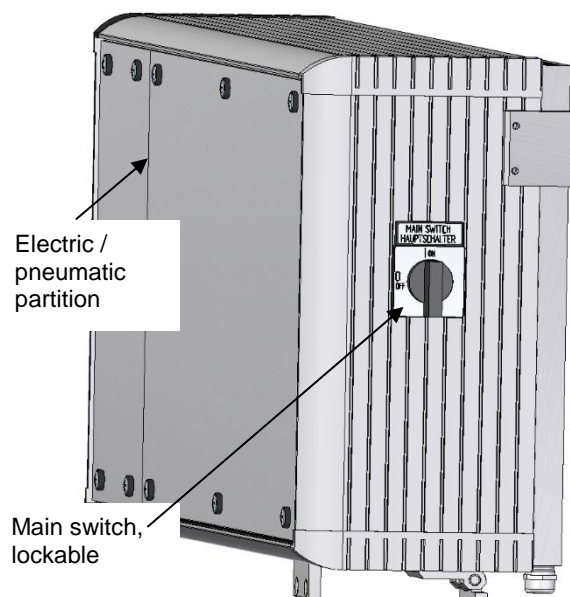


Figure 10 – Control unit; main switch side



- Pneumatic module complete with:
 - Service unit with a closable pressure control valve, a pressure gauge, a moisture separator as well as an air filter
 - Air shut-off valve with air bleeder
 - Solenoid valve for controlling the pneumatic actuators
 - Signal relay for the electronic control signals
 - Key switch for pressing during emergency mode
 - Bending button during emergency mode

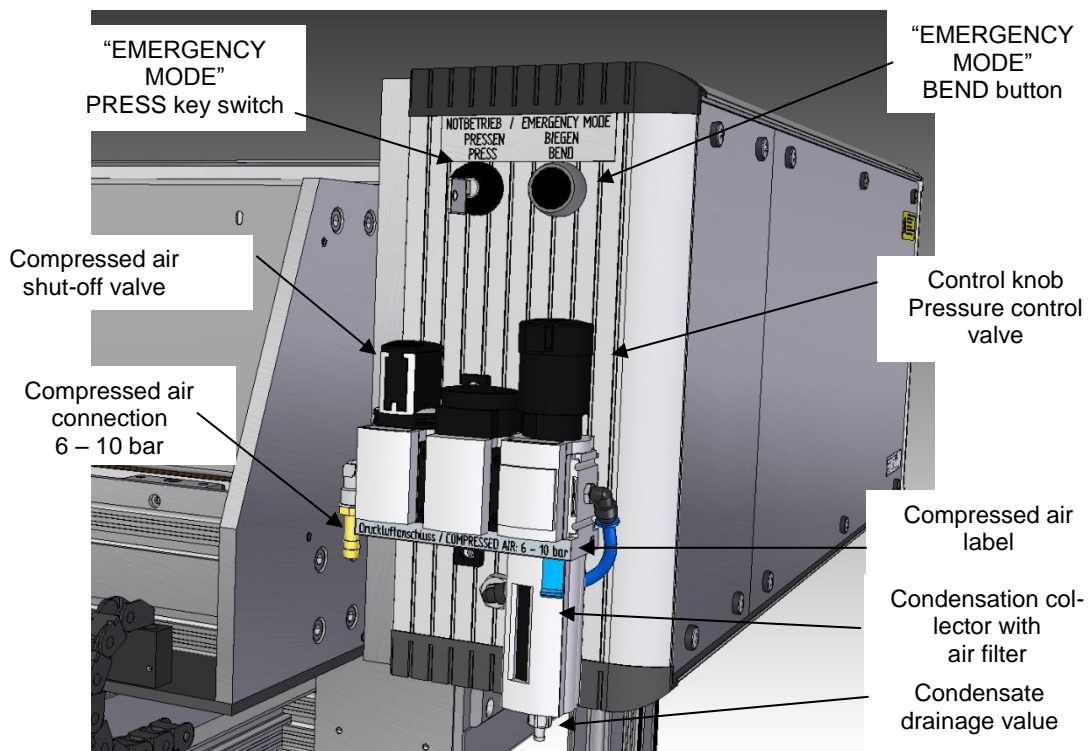


Figure 11 – Control unit; pneumatic side

5.6 SOFTWARE

- MS-WINDOWS 10 Professional operating system
 - Bending device operation and control software
- installed on an industrial PC
installed on an industrial PC

5.7 DOCUMENTATION

- Technical documentation (this operating manual)
- CD with attachments (measuring elements, documentation)

5.8 MEASURING ELEMENTS

With the purchase of the positioning system, a license for using the measuring elements is also additionally acquired. These can be found in digital form as PDF files on the delivered CD.

The elements are designed so that they are practically indistinguishable.

Instructions for positioning the measuring elements can be found in Appendix 1.



The correct position of the measuring elements on the printing plate is crucial for ensuring the functionality and precision of the automatic positioning process. Please image your plates carefully.

6 INSPECTING THE DEFAULT MECHANICAL SETTINGS

Before the initial operation of the device, the default mechanical settings should be inspected and, if necessary, corrected. The first thing to do is to set the correct horizontal alignment. This is checked by using three precision horizontal bubble levels. The correct setting is described in Section 3.3.

The first setting inspection should be done on the horizontal bubble level located on the fixed bending table which should be positioned as close to the middle as possible (at least 6 arc seconds per 2 mm bubble movement). The measured value should correspond to about the average of the bubble level on the movable bending table. Following this, the movable bending table should be moved through all the possible format widths by using the format settings in the control software. During this movement, the horizontal bubble level value should not change.

Finally, the bending process for the minimum and maximum format should be controlled by using plate segments. By making a direct visual comparison between each plate strip, an assessment of the precision can take place.

If there are differences during the bending control or the bubble level movement, a readjustment needs to take place according to Appendix 6.

7 OPERATING THE PRINTING PLATE POSITIONING SYSTEM

7.1 OPERATING MODES

The printing plate bending process can take place in the following operating modes:

- “Automatic mode”
- “Emergency mode”

7.1.1 AUTOMATIC MODE



A requirement for using the advantages of the positioning system in automatic mode is the presence of two special measuring elements on the printing plate.
After the PC has been powered on, automatic mode is the default setting for the positioning system.

In “automatic mode”, the positioning process is carried out based on the position of the printing image, meaning that the printing plate will be aligned based on the position of the measuring elements.

7.1.2 EMERGENCY MODE

During “emergency mode”, the bending process takes place like any normal mechanical bending process, which is only performed using the precision of the mechanical end stops.



This operating mode is intended in cases where the measuring elements are not available or when the electronic control unit is inoperable.

Requirements:

- Power off control unit, main switch “OFF”, (Recommended: Pull out power plug!)
- Compressed air must be attached and ready

	<p>In order to begin the bending process in emergency mode, it is mandatory that the electrical control is powered off.</p> <p>The printing plate end stops must be changed.</p>
--	--

Since the printing plate end stops on the bending edge are set to 8 mm to allow free space for the plate positioning in automatic mode, the end stops need to be set to 7 mm for manual operation. For this, the cover of the adjustable crossbeam for the printing plate end stops needs to be removed (see Figure 12).

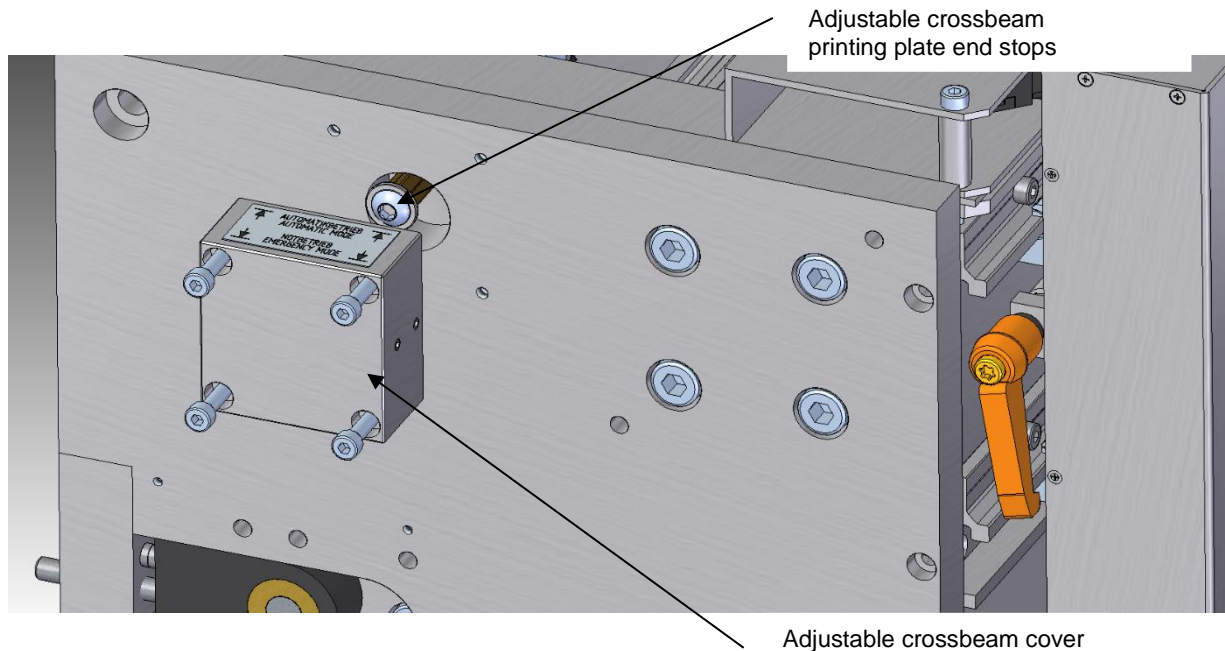


Figure 12 – Adjustable crossbeam printing plate end stops

Together with a second person, the key switch “PRESS” can be turned on. After this, press the “BEND” button (Figure 13) and hold. While the button is held, the adjustable crossbeam for the printing plate end stops must be pulled out from the machine panel as far as it can go. Release the button and turn off the “PRESS” switch. The adjustable crossbeam cover can be screwed back in place.

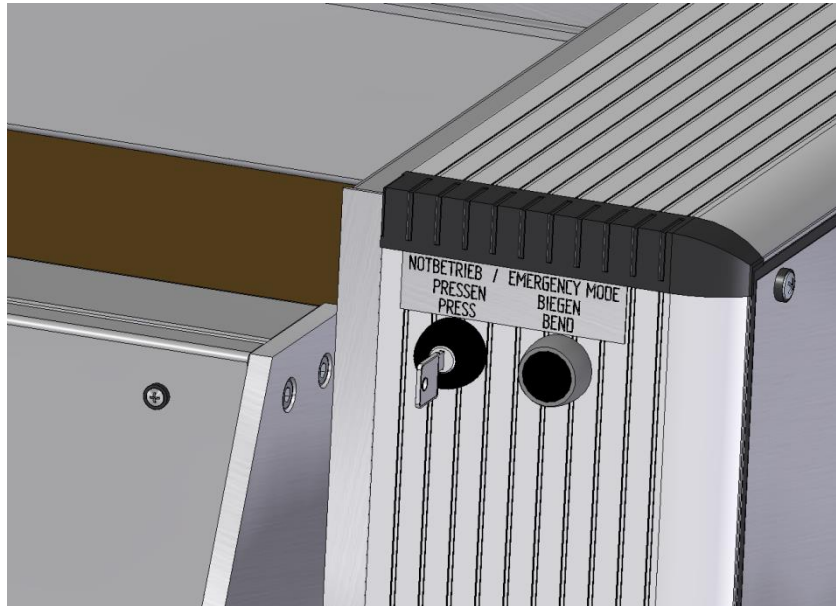
In order to return the device to automatic mode, the process is done in a similar manner; only after pressing the “BEND” button, the adjustable crossbeam will be pushed back into place.

During the manual bending process, the printing plate needs to be positioned carefully into place against the end stop positions just like in automatic mode.



Next, the press bars are lowered by turning on the key switch “PRESS” on the pneumatic module (Figure 13). The actual bending takes place by pressing the “BEND” button. The bending function is only active when the pressing step has preceded it. After the bending process has ended, the key switch must be turned off. The printing plate can now be removed.

Figure 13 – Control devices for emergency mode



7.2 POWERING ON AND POWERING OFF (AUTOMATIC MODE)

7.2.1 POWERING ON

Connect the compressed air and the electrical supply to the device and turn on the main switch (Figure 10).

To power on the automatic bending device, press the “control unit ON/OFF” button below the display panel (Figure 8). The system start takes about one minute and the display panel shows the starting progress. The operating system and the operation and control software of the bending device are started. (Figure 14)

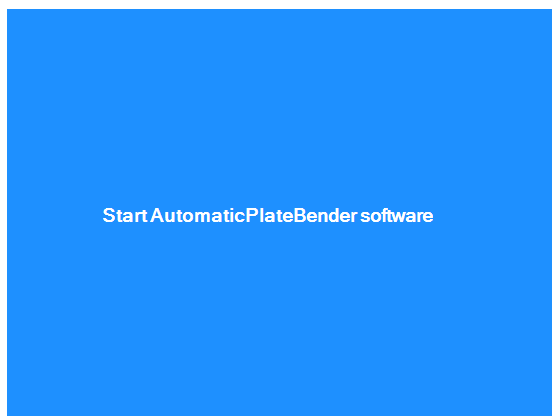


Figure 14 – Starting screen

After the system has been started, several initializations and verifications of the system components take place. The current printing plate width and format length are detected (cf. Section 7.3. and 7.4.). The system is ready for operation when the lower part of the screen displays “Insert printing plate...” (Figure 15)

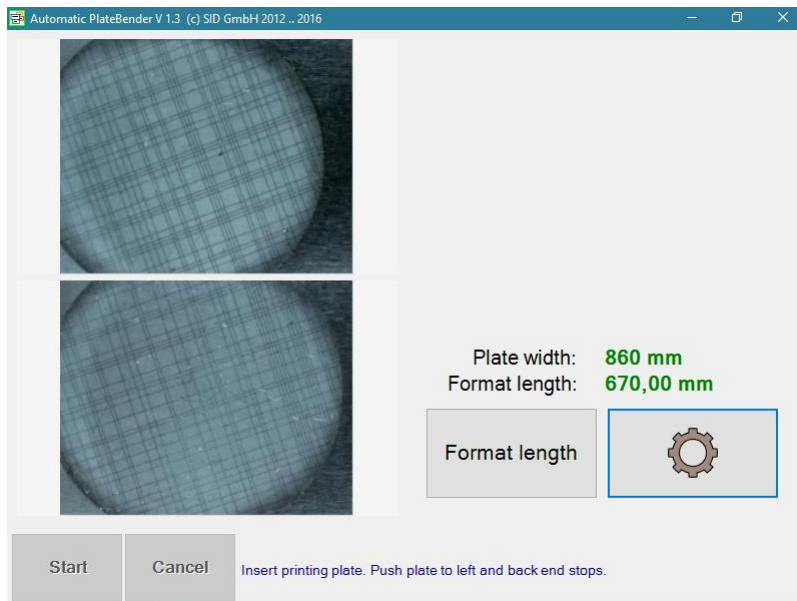


Figure 15 – Software displaying operational readiness



All further operation actions take place using the user interface on the display panel. The “control unit ON/OFF” button is only used to power the system on and off.

7.2.2 POWERING OFF

To power off the bending device, shortly press the “control unit ON/OFF” button underneath the display panel. When the display is off, the device can be completely deactivated by using the main switch after a short waiting period, if desired.

7.2.3 AUTOMATIC POWER OFF

Optionally, the software has a setting to power off the bending device automatically every day at a desired time (see Section 7.3.2)

In case the bending device overheats, it will automatically power off. This will be shown shortly on the display (Figure 16).

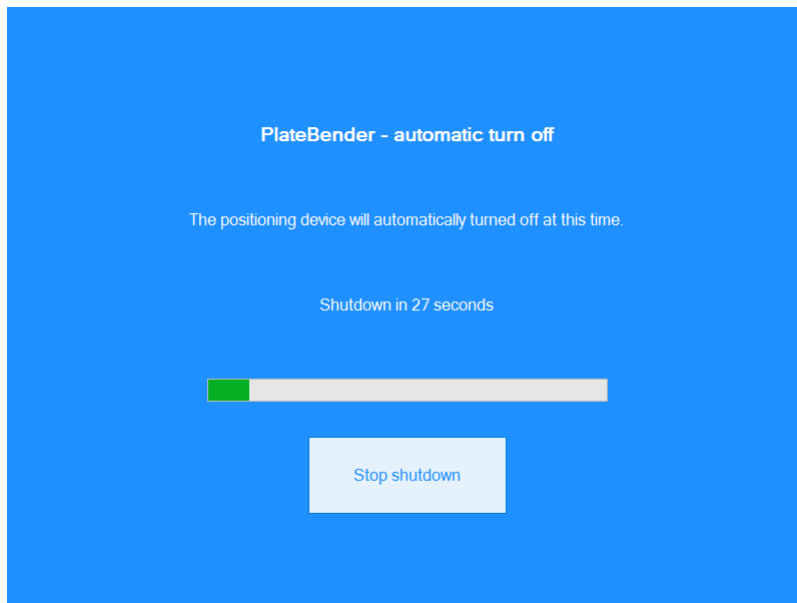


Figure 16 – Display screen, automatic power off

7.3 SETTING THE PRINTING PLATE WIDTH

The bending device is designed for printing plate widths of 520 (optional 530), 860 and 1060 (1090 large size format) mm. Based on these widths, there are four reference measuring elements positioned on bending module A (Figure 5) corresponding to these distances.

In order to switch between the different widths, simply loosen the locking lever on the front video module (Figure 17), push it above the desired reference element and lock it in place. When moving the video module, a dialogue window will open on the display (Figure 17), which will show you a live view of both cameras. If a reference element is recognised by the measurement system, it will be signalled by a cross-shaped figure made up of multiple red circles. When the lever is locked, a new reference position is read and simultaneously the new printing plate width is determined.

After the new reference position has been successfully read, the dialogue window closes and the user interface displays the new plate width (Figure 15).

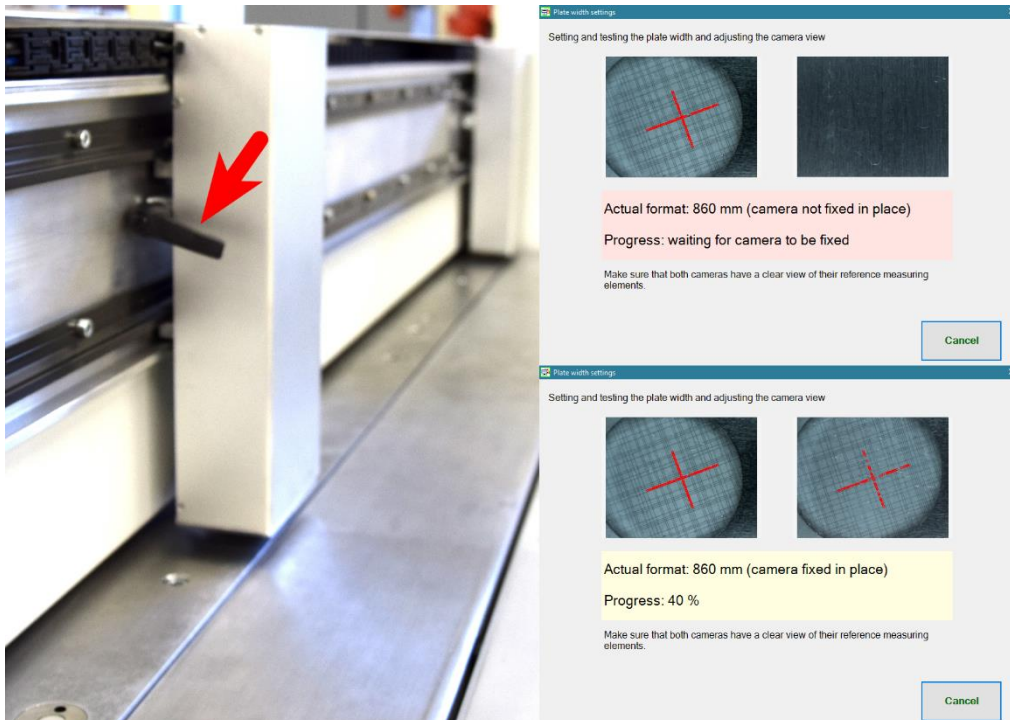


Figure 17 – Front video module with locking lever (left), dialogue window for setting the printing plate width (right)

If the video module does not have a reference element in view or if you leave the dialogue window before a reference position has been read, the bending device cannot position any printing plates (Figure 18).

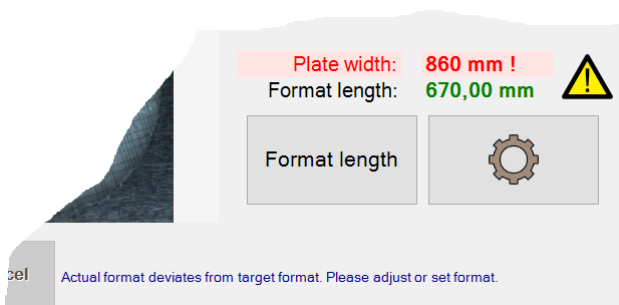



Figure 18 – Printing plate width has not been correctly read

If you would now try and automatically position and bend a printing plate or try and set another format length, the display will continue to display the dialogue window for setting the plate width. The window will keep showing until a reference element is visible to the video module and the reference measurement has been successfully performed. In this case, slide the video module to the reference element of the desired plate width, lock the lever and let the new reference position be read.



7.4 SETTING THE FORMAT LENGTH

The bending device can process printing plates with format lengths between 406.4 and 762.0 (large size format up to 929.4) mm (for sleeves with circumferences between 16 and 30 inches (large size format 36 inches)).

	<p>The actual distance between the leading bending edge and the trailing bending edge of the printing plate is not identical to the entered format length value. For user-friendliness reasons, the user interface indicates only the common sleeve circumferences for the format length dimension target value and the actual value. The true distance is converted internally.</p>
---	--

The bending device software is continuously checking the format length differences between the target value and the actual value. If the target value and the actual value differ more than 0.02 mm from each other, the automatic positioning and bending process is stopped. While idling, the bending device will automatically correct differences of less than 1 mm and greater than 0.02 mm between the target and actual values. In case the difference is too large, the dialogue window for setting the format length (Figure 19) will keep showing when trying to start the positioning process.

In order to change the format length or to readjust the target and actual values, press the “Format length” button (Figure 15) which will open the dialogue window for setting the format length (Figure 19).

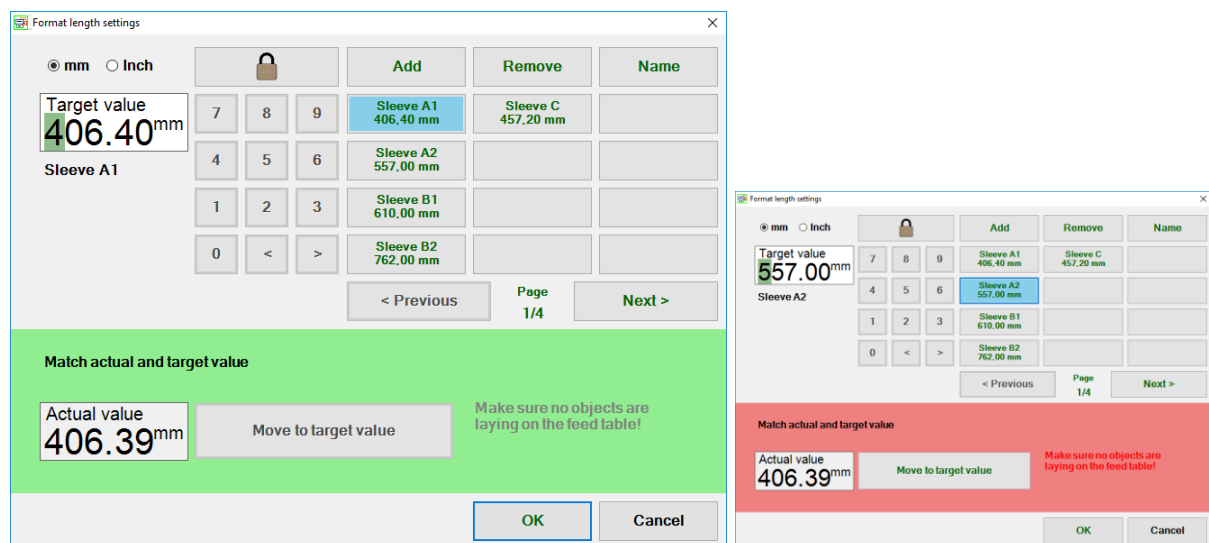


Figure 19 – Dialogue window for setting the format length

To enter a new target value, either choose a value from the quick selection list or enter a value using the number pad.

A total of 48 target values are able to be saved as a quick selection. 12 of these entries are always shown in the quick selection list. Using the “Next” and “Previous” buttons, you can navigate through all 48 entries.

When opening the dialogue window, the number pad is always locked in order to avoid unintentional entries. This can be unlocked by pressing the button with the padlock symbol.

If you have set a new target value that differs more than 0.02 mm from the actual value, the area at the bottom of the dialogue window turns red and the “Move to target value” button becomes active. (Figure 19, right)

After pressing this button, the bending module B is moved to the correct corresponding position. Before starting the moving process, please make sure that there are no objects between



bending modules A and B. If there is a printing plate in the bending device, the moving process will not take place.

You can leave this dialogue window by pressing the “OK” button, thereby accepting all changes which have been made (target values, new or edited entries in the quick selection list and changing the displayed unit of measurement). If you leave the window by pressing “Cancel”, all of the settings remain unchanged and stay as they were before the dialogue window was opened. A set actual value which may have possibly been changed during this time will not be reset.

Describing the Procedure for Adding, Removing or Renaming Entries in the Quick Selection List:

Add entry:

1. *Press the “Add entry” button. This changes the colours of the quick selection fields which can have entries added to them.*
2. *Now press the quick selection field where the current set value should be stored.*
3. *If the quick selection field which you have chosen does not have a value, the set value will be stored there.*
4. *If you have chosen a field that already has an assigned set value, a confirmation window will open where you will be asked to confirm overwriting the old value.*

Remove entry:

1. *Press the “Remove entry” button. This changes the colours of the quick selection fields.*
2. *Now press the quick selection field with the value which you would like to remove.*
3. *When you confirm that you actually would like to remove the value in the following confirmation window, the value will be removed.*

Name and rename entry:


1. *Press the “Name” button. This changes the colours of the quick selection fields.*
2. *Now press the quick selection field with the entry which you would like to name or rename.*
3. *Enter a new name or change the name of an existing entry in the dialogue window which appears and close the dialogue window by pressing “OK”. (The number of characters is limited to 16)*

7.5 AUTOMATICALLY BENDING PRINTING PLATES

7.5.1 INSERTING A PRINTING PLATE

Set the necessary plate width and format length (see Sections 7.3 and 7.4)

Use the printing plate support and the insertion end stop on bending module A to help insert the printing plate (Figure 5)

	<p>Please wear safety gloves while using the printing plate bender as injuries resulting from the sharp edges of the printing plate during insertion and removal cannot be ruled out.</p>
---	---

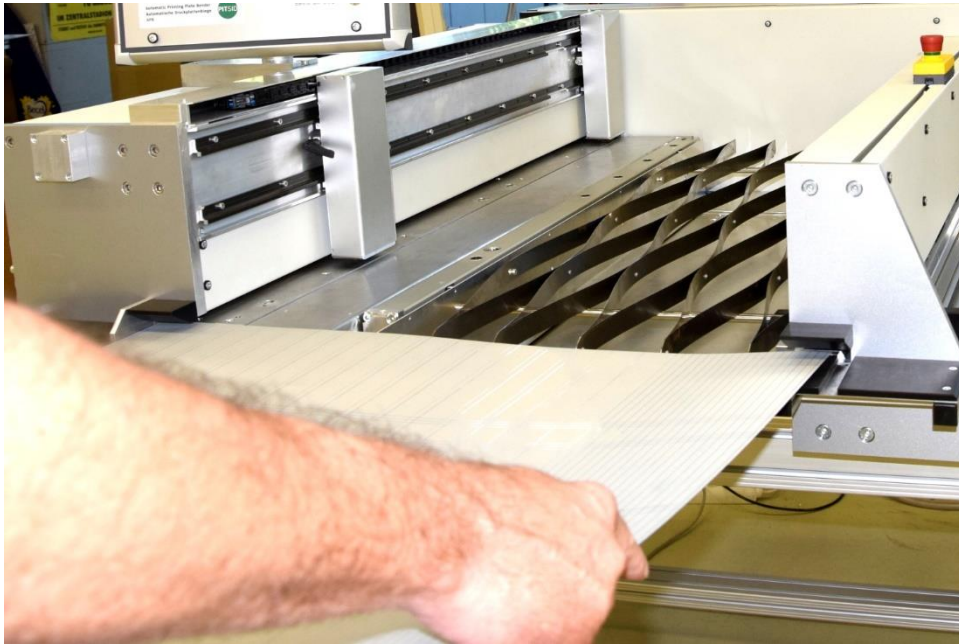


Figure 20 – Inserting the printing plate

First, push the printing plate with the printing image facing up to the rear end stop and then to the left (Figure 20). Inside bending module A are two end stops. The plate should rest against all three end stops. As soon as the printing plate moves over the printing plate sensor during insertion (Figure 7), a live video image of both cameras is shown. If the printing plate has been correctly positioned against the end stops, the measuring elements will be visible in both camera images (Figure 21).

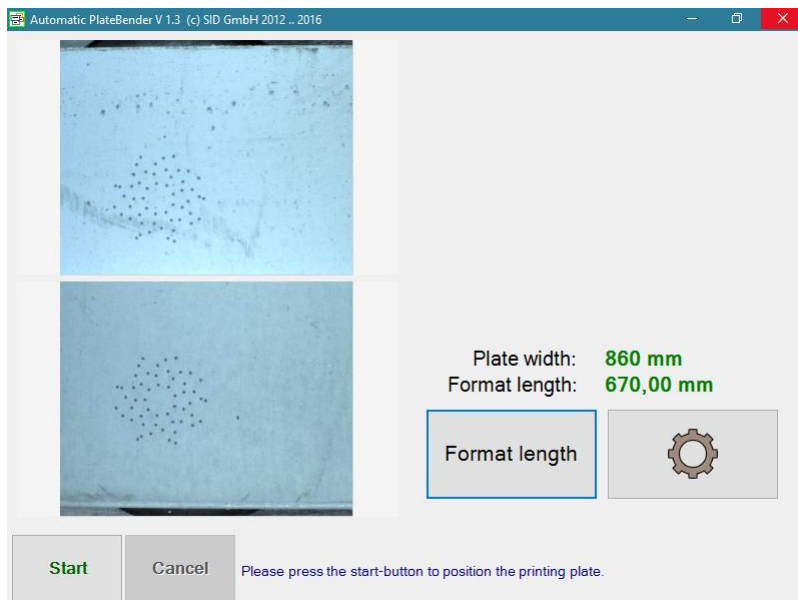


Figure 21 – User interface, correctly inserted printing plate

7.5.2 POSITIONING AND BENDING

After the printing plate has been correctly inserted into the bending device, press the “Start” button. The printing plate will be fixed to the positioning cross-plate by the suction cups (Figure 7). It is possible that a wavy plate will need to be lightly pressed against to improve the vacuum. The printing plate positioning process is subsequently started. That means that the printing plate will be aligned in such a way that the ideal bending line of the printing image will be moved to the corresponding bending line of the bending device by means of the imaged measuring elements.

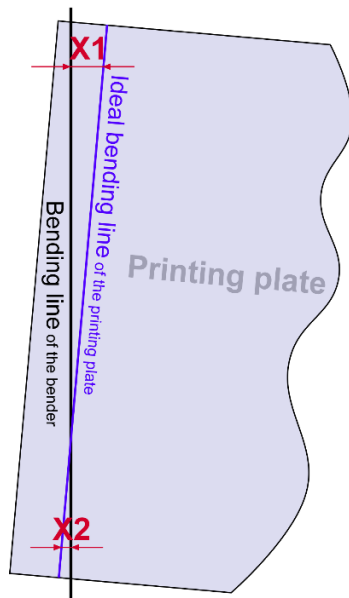


Figure 22 – Diagram of the positioning principle

This process takes place iteratively. This can be seen by the repeated lowering of the pressing bars and the display of progressively smaller deviations of the leading edges X1 and X2 (Figure 23).

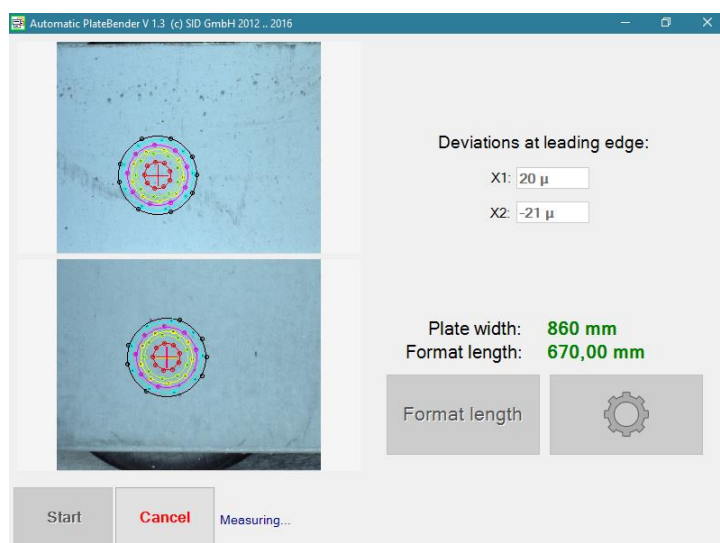



Figure 23 – User interface, positioning process



	<p>Do not reach into the working area of the positioning device after the plate positioning process has started. Please wait to make any further operational actions until the positioning process has ended.</p> <p>The positioning process could otherwise be extended or made impossible.</p>
---	--

Between the iteration steps and after the positioning process has ended, the pressing bars will be pressed onto the printing plate in order to ensure an equally stable printing plate position during the measurement and during the bending process.

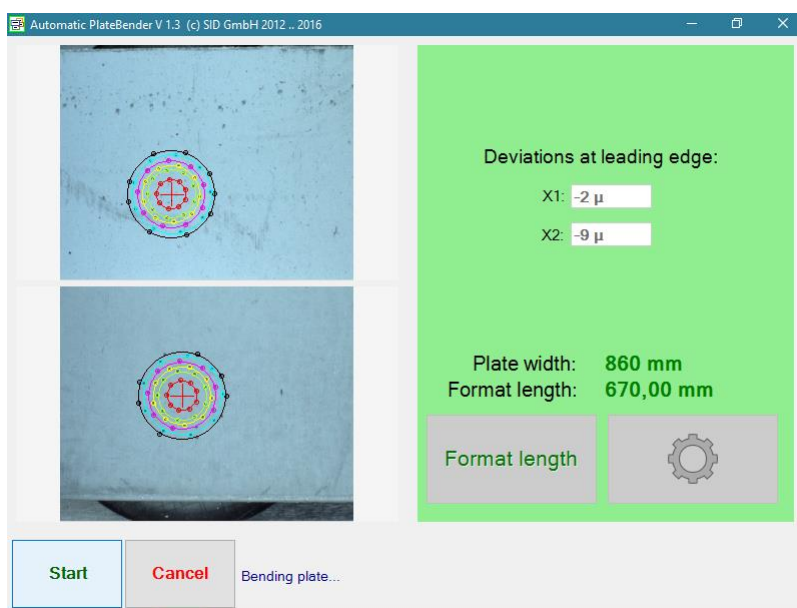


Figure 24 – User interface after the positioning process has ended

After the positioning process has ended, the achieved deviations from the ideal target position are shown on the display (Figure 24). The bending process will then be automatically carried out. The bending unit and the pressing bars will then release the printing plate and it can be removed.

All further printing plates will be positioned and bent in the same way.

If positioning problems occur which lead to the final accuracy ($< 3 \mu\text{m}$) not being met, the positioning process will stop after a maximum of 60 seconds or a maximum of 20 iteration steps. The automatic bending process will not be carried out.



Figure 25 – User interface after positioning process with an inadequate result

The pressing bars, however, will stay lowered. You can still bend the printing plate by pressing the “Start” button or you can cancel the process which releases the pressing bars and allows you to start and try the positioning process again.



7.5.3 REMOVING A PRINTING PLATE

After the printing plate has been bent and the pressing bars have been released, the printing plate can be removed, meaning pulled out of the bending device. Pull the plate forward as straight as possible and make sure not to stress the plate by tilting it up during removal.




Figure 26 – Printing plate removal

Mount the printing plate on the sleeve in the usual manner.

7.6 SOFTWARE SETTINGS

7.6.1 IN GENERAL

By pressing the  (settings) button, the settings menu opens. It is divided into two menu tabs (Figure 27).

- Basics
- Adjustment

7.6.2 “BASICS” MENU

Option	Description
Language	Here you can set the language of the user interface.
Detailed information	If you choose this option, the user prompt descriptions at the bottom of the user interface are more specific. Because there is more text needed for the description, a smaller font size is used.
Daily automatic shutdown at:	The option to automatically shut down the bending device at a specific time each day can be set here (see Section 7.2.3).
Show in full screen mode	If this option is chosen, the main software window (Figure 15) is displayed in full screen mode.

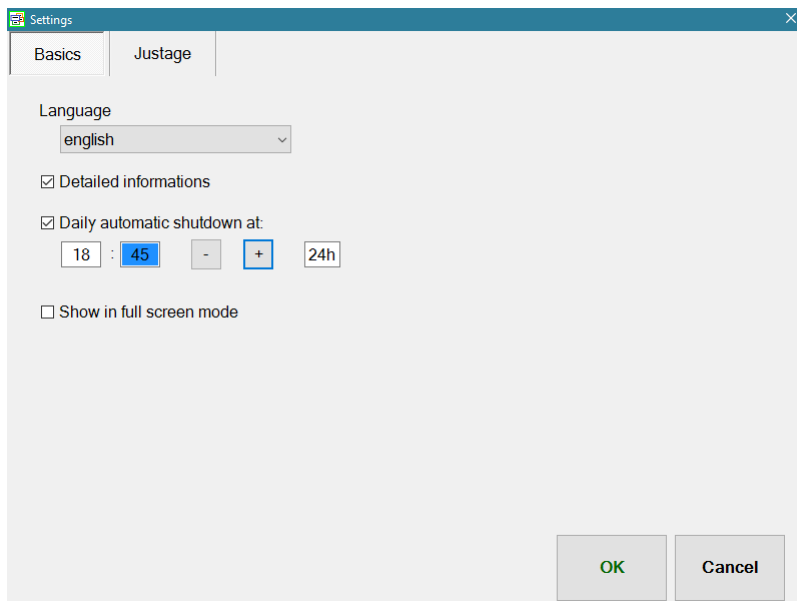


Figure 27 – Basic settings

7.6.3 “ADJUSTMENT” MENU

In spite of the very precise positioning process, the position of the bending edge is usually not parallel to the printing image because of mounting-related tolerances of the bending device, the positioning system and the printing plate imagesetter. Since these tolerances are not random, but rather occur systematically, these errors can be eliminated or reduced to a minimum using the following procedure.

These adjustments are not intended to be carried out periodically. They are only necessary when a misalignment of the printing image is noticed on the sleeve-mounted printing plate. Usually, this adjustment is only made once, like after the bending device is installed. This should always ensure a mounted plate with an axially parallel printing image as long as the bending device is not moved or modified.

The procedure is to be carried out separately for each plate width. It makes the most sense to carry out the adjustment with printing plates of the largest possible format length so that the differences between the leading edge and the trailing edge are clearly visible.

Image a printing plate with measuring elements and deviation marks (Figure 28). The vertical centre lines of the bottom and top deviation marks must be in perfect alignment.

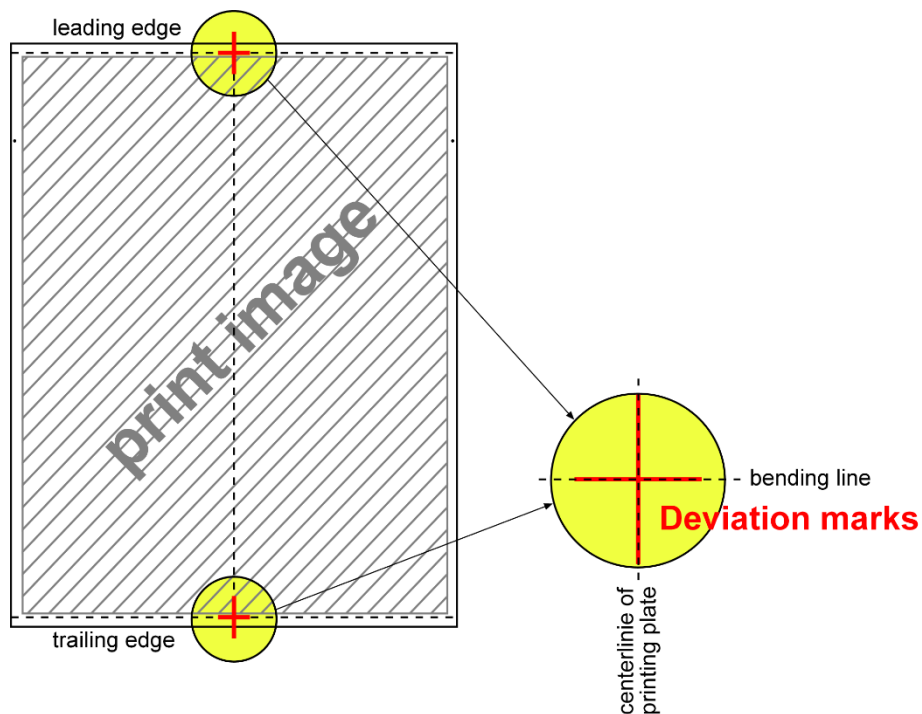


Figure 28 – Diagram for a printing plate with deviation marks

Bend this printing plate in automatic mode according to the instructions in this manual (see Section 7.5.2). Mount the printing plate onto the sleeve using a mounting device. The subsequent lateral misalignment of the vertical centre line deviation marks of the leading edge to the trailing edge is to be assessed.

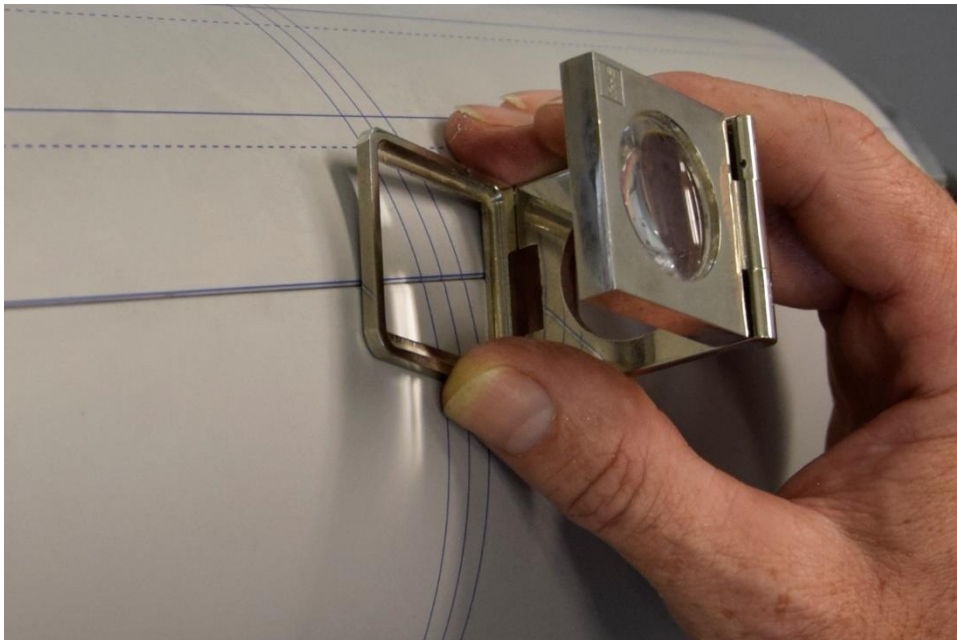



Figure 29 – Assessment of the misalignment

A longitudinal misalignment can be determined by the positional deviation of the horizontal lines to their target position on the bending edge (Figure 29). Use a magnifier or something similar for this.



Open the settings by pressing the  (settings) button and choose the “Adjustment” menu (Figure 30). Then check if the settings for the plate width and format length are actually those of the printing plate which has just been checked for misalignment. Make corrections if needed.

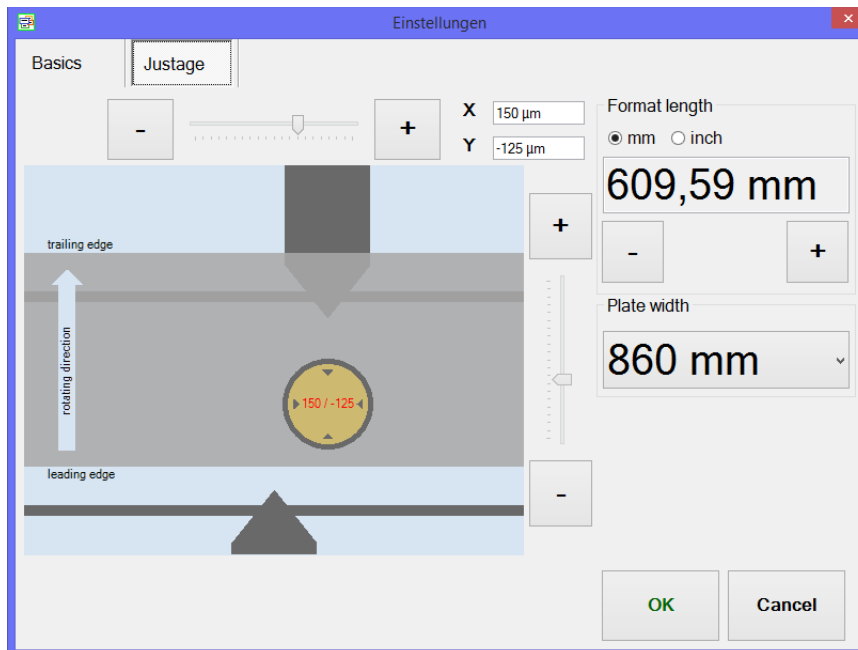


Figure 30 – Adjustment settings



When opening this dialogue window, the current actual values in the bending device are shown for the plate width and format length. If you change the values in the dialogue window, it will have no influence of the values outside of this dialogue window. These values are, however, necessary for the calculation and storage of the determined compensational values.

The horizontal grey area of the diagram in the adjustment dialogue window symbolises the mounting slot on the sleeve. The printing plate trailing edge on top and the leading edge on the bottom adjoin on the slot just like in usual sleeve mounting. If you are able to have the sleeve which is being used to determine the misalignment in front of you as you see it in the diagram, you can enter the deviations exactly as you see them. Otherwise (if the trailing edge is at the bottom and the leading edge is at the top, for example), you need to negate (reverse the value sign of) the determined x and y misalignment values when entering them in the dialogue window.

Example: You determine with a magnifier that the vertical line of the trailing edge to the leading edge is about 0.1 mm (100 µm) to far to the left and 0.2 mm to far above. In the adjustment dialogue window, you would enter an x value of -100 µm and a y value of 200 µm.

By clicking on “OK”, the entered offset values are calculated and saved in the system as compensational values.

If in the unusual case that the offset values that need to be entered are larger than 0.5 mm, you will need to open the dialogue window multiple times in a row.



Example: You want to enter a misalignment in the x direction of -1.2 mm. Open the dialogue window and enter -500 μm as the x value and close the window with "OK". Open the window a second time, enter -500 μm as the x value again and press "OK". Open the window for a third and last time and enter -200 μm and close with "OK".

This procedure may need to be repeated multiple times depending on the adjustment precision. This iterative setup process can be done for all other printing plates used in production which contain the control elements shown in Figure 28 after the primary adjustment has been successfully made (determined compensation values on the mounted plate < 30 μm).

7.7 USER PROMPTS

7.7.1 IN GENERAL

All vital user prompts and error messages are shown at the bottom of the user interface.

7.7.2 OVERVIEW OF THE DISPLAY PROMPTS

User instructions

These give the operator direct operating instructions and are available in either a simpler or a more detailed form (grey background) (see Section 7.6.2)

Prompt	Description
Feed printing plate more accurately! Please feed printing plate closely fitted to the end stops.	You have placed the printing plate so far from the side end stops that the cameras can still see the reference elements. This message must be confirmed by pressing the "Cancel" button. You can then place the plate again.
Insert printing plate! Insert printing plate. Push plate to left and back end stops.	This message informs you that the bending device is ready for use if no printing plate is inserted.
Remove printing plate! Please remove printing plate.	This message is shown if a reference measurement should be made but the camera view to a reference element is obstructed due to an inserted printing plate.
Format misaligned. Please set format. Actual format deviates from target format. Please adjust or set format.	The format length actual value differs from the target value or the adjustable camera is unlocked or is not placed above a reference element. Before you can proceed to position and bend any printing plates, you will need to resolve this discrepancy. Proceed as described in Sections 7.3 and 7.4.
Do not touch handwheel! Do not touch handwheel during positioning or bending.	During the positioning or the bending process, the handwheel used for setting the format length has been moved. This message must be confirmed by pressing the "Cancel" button. As long as the actual value and the target value still match, you can try reinserting the plate. Otherwise, you must remove the printing plate and correct the format differences (Section 7.4).
Do not unlock camera! Do not unlock camera during positioning or bending.	The adjustable camera became unlocked during the positioning or the bending process. This message must be confirmed by pressing the "Cancel" button. The plate must then be removed, the adjustable camera needs to be placed above a reference element and the lever needs



	to be locked so that a reference measurement can take place. Only then can the plate be once again inserted.
No elements found.	During positioning, only one (not during the first measurement) or none of the measuring elements were recognised. Either the printing plate does not contain any measuring elements, or they are not placed at the correct position (Section 10.1) or the plate has not been correctly inserted. You could bend the plate by pressing the "Start" button. The bending process will then only be using the precision of the mechanical end stops.
No elements found. Check plate, bend manually if necessary.	
No reference targets found.	This message is shown if the automatic reference measurement should be carried out but the camera view of at least one of the two reference elements is blocked. Either there is something covering the reference element, the elements are dirty or the camera is out of focus or is not sending an image at all.
Make sure that both cameras have a clear view of their reference measuring elements.	
Bend plate or press 'Cancel'.	When the printing plate positioning process is finished and an insufficient precision is reached, you now have the choice of either bending the plate in spite of this by pressing the "Start" button or cancelling.
Bend plate or press 'Cancel' to release pressure beams.	
Press on plate to support exhauster!	While beginning the positioning process, it has been detected that the suction cups have not built up enough vacuum. Usually the reason for this is a plate which is not lying flat. Lightly press the plate in the area of the positioning cross-plate in order press the plate flat against the suction cups.
Insufficient vacuum. Check vacuum, press on plate to support exhauster if necessary.	
Press Start button!	After the printing plate has been inserted, you can now begin the positioning process by pressing the "Start" button.
Please press the Start button to position the printing plate.	
EMERGENCY STOP	The emergency stop button has been pressed. Release the button after the reasons for pressing it have been resolved and confirm the message by pressing the "Cancel" button.

Operational messages

These show the momentary operational states of the bending device

Measuring finally...

Finished

Bending plate...

Initialising devices...

Testing format settings...

Measuring calibration normal...

Measuring...

Driving motors...

Initializing motors...

Control device available.



Checking vacuum...
 Processing...
 Compare...
 Wait for input...
 Waiting...
 Drive to end stop position...
 Drive to zero position...

Error messages

If the following errors occur, all of the bending device functions will no longer be available (e.g. pressing bar pressure, positioning process, measurement process, etc.). Confirm the error message by pressing the "Cancel" button.

Prompt	Description
Error message: One measuring element was not recognized.	During the first positioning measurement one or both of the measuring elements were not recognised.
Error message: Reading format problem.	The device for measuring the format length has not delivered valid results.
	The adjustment distance needed to position the printing plate is larger than the positioning device is able to move. A reason for this could be an imprecisely inserted printing plate, a weak vacuum, or an obstruction that is jamming the plate movement.
Error message: Position out of reach	

Critical error messages

The following errors will only be recognised during the initialisation of the bending device. They mainly concern the hardware components of the bending device. If one of these errors occurs twice after a restart, immediately contact customer service. You can now only operate in emergency mode (Section 7.1.2).

Hardware not found.
 Camera 1 not found.
 Camera 2 not found.
 Motor 1 not initialized.
 Motor 2 not initialized.
 Motor 3 not initialized.
 Motors not initialized.
 Firmware not valid.

7.8 WARRANTY

The bending device has a warranty period of 12 months. If the system becomes inoperable during the warranty period, it will be repaired by the manufacturer free of charge or replaced; excluded are the named cases below.

The warranty will be fulfilled by repairing the bending device, by replacing with a new bending device or by replacing with a repaired, reconditioned bending device.

The warranty does not apply to defects which have been caused inadvertently or willfully, by misuse or by natural catastrophes, or by unauthorised intervention in the system.



Damages caused by a failure to observe the specifications described in the documentation, by improper handling, improper use of the measuring elements and changes to the software (e.g. viruses) are excluded from the warranty. The supplier information applies in case of errors in the Windows® operating system.

The warranty only applies to the functionality performed by the product but not to consequential damages in connection with the use of the bending device.

In order to claim the warranty services as described, please contact the manufacturer within the warranty period. The manner in which a repair occurs (on-site repair, return shipment of the bending device) lies with the manufacturer.

8 MAINTENANCE AND SERVICE INFORMATION

8.1 MAINTENANCE AND MAINTENANCE INTERVALS

Object	Performed maintenance	Maintenance interval	Carried out by
Condensation collector on the moisture separator of the pneumatic service unit (Figure 11)	Manually drain the condensate by turning the drainage valve underneath the water separator to the left	When necessary: at the latest when the condensate level is about 1 cm below the bottom edge of the filter	Operator
Air filter in the pneumatic service unit (Figure 11)	Change the filter cartridge after unscrewing the acrylic housing and loosening the filter retaining screw	When necessary: if the operating pressure on the pressure gauge falls considerably when using air (suction and/or pressing)	Operator
Air filter for the suction cups in the positioning device	Remove the acrylic glass cover underneath the device. Then open the lower filter cover and replace the filter	When necessary: if the suction performance of individual suction cups is considerably reduced	Operator
Reference measuring elements	Clean with a soft, anti-static cloth, if necessary with a mild degreasing cleaning agent (display cleaner)	When necessary: at the latest when the message "Clean reference elements!" appears	Operator
Touch screen	Clean with a soft, anti-static cloth, if necessary with a mild degreasing cleaning agent (display cleaner)	When necessary	Operator



8.2 REPLACEMENT PARTS

The delivery of replacement parts occurs after consulting the manufacturer. The following parts are available for scheduled maintenance:

Replacement part	Order No.	Delivery time
Replacement filter cartridge MS4-LFP-C for the service unit	Festo 534 501	1 week
Replacement filter cartridge LFP-D-MICRO-5M for the suction cups	Festo 256 818	1 week
Display cleaner	CRC Industries SCREEN99NF	1 week



9 TECHNICAL DATA

General data

Name	Automatic Printing Plate Bender
Device No.	See device nameplate
Manufacturer	Polygraphische innovative Technik Leipzig GmbH
Dimensions (D, W, H)	1500 mm x 1400 mm x 1600 mm (large size format 1600 mm x 1700 mm x 1600 mm)
Net mass	200 (large size format 230) kg
Gross mass	400 (large size format 480) kg
Power supply voltage	100-240 VAC / 50/60 Hz
Power consumption	< 100 VA
Backup fuse AC power inlet	10 A
Compressed air supply	6 - 10 bar oil-free compressed air
Air consumption	100 NI/min

Operating conditions

Operating temperature	5 °C to +30 °C
Storage temperature	-10 °C to +50 °C
Air humidity	30 % to 85 % non-condensing
Impact stress during operation	< 5 G
Vibration during operation	max. 0.7 G (at 5 - 200 Hz)
Impact stress during transportation	≤ 25 G

Parameters

Plate widths	520 (530 *) mm	860 mm	1060 (1090 **) mm
Measuring element distances	510 (520 *) mm	850 mm	1050 (1080 **) mm
Plate lengths	420 mm to 777 (929.4 **) mm		
Bending length	7 mm leading edge		7 mm trailing edge
Bending angle	60° leading edge		120° trailing edge
Bending radius	≤ 0.2 mm leading edge		≤ 0.2 mm trailing edge
Plate material	Aluminium		
Plate thickness	≤ 0.3 mm		
Printing plate type	Conventional printing plates, no process-free printing plates		

* Optional

** Large size format

Optimum measurement conditions

Operating temperature	+20 °C to +25 °C
Air humidity	40 % to 70 %

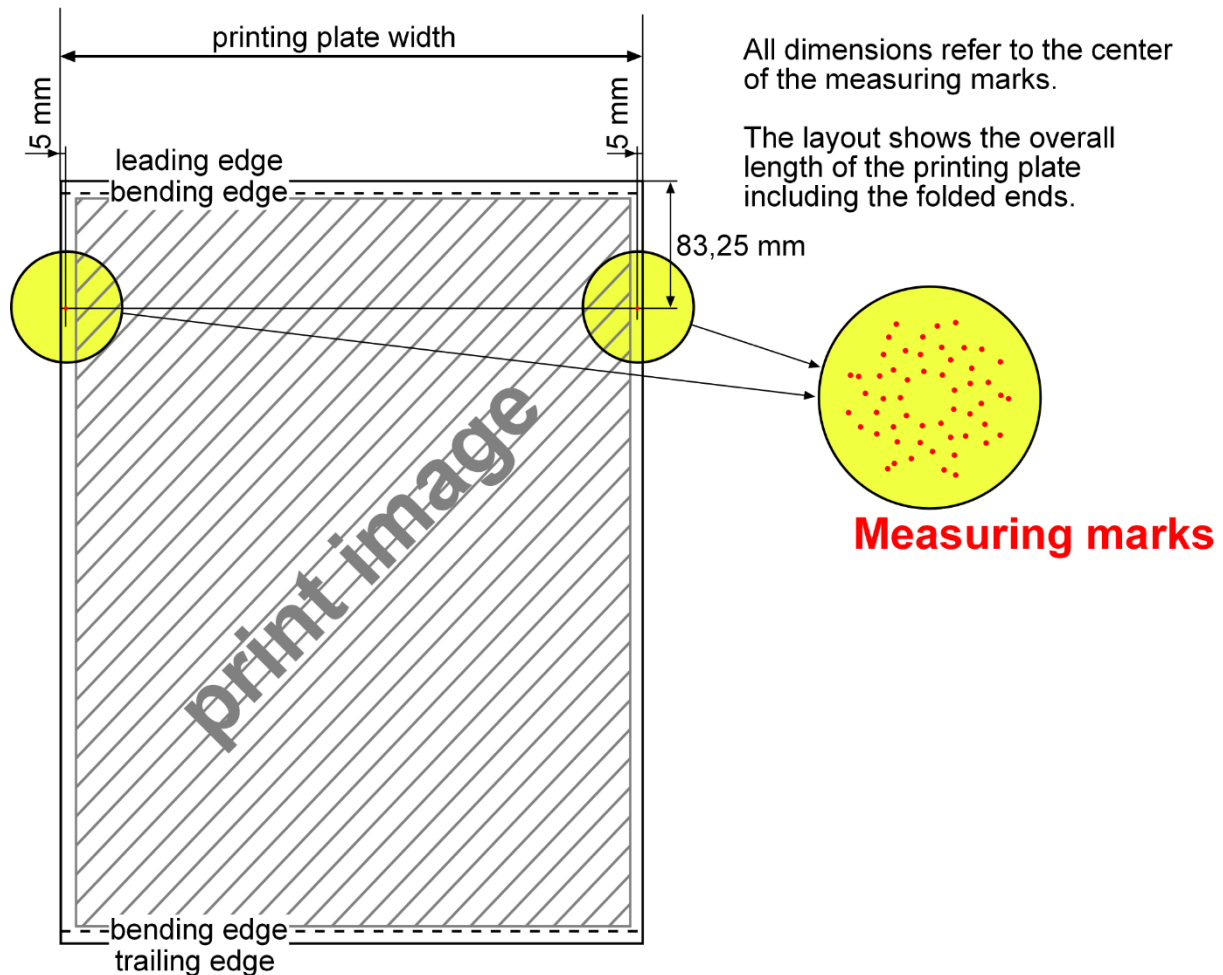
Printing plate positional correction

Positioning range in x/y direction	Approx. ± 1.5 mm
Adjustment angle	< ± 0.5°

10 APPENDIX

10.1 APPENDIX 1: PLACEMENT OF THE MEASURING ELEMENTS

The measuring element file is found on the delivered CD.



Attention! The size and the predetermined position of the measuring elements are never allowed to be changed. Please keep this in mind after making any changes to the printing image!



10.2 APPENDIX 2: DECLARATION OF CONFORMITY

EC Declaration of Conformity

The

PITSID - Polygraphische
Innovative Technik Leipzig GmbH
Mommsenstr. 2

04329 Leipzig

Germany

as manufacturer and distributor

declares that the product:

Name: **Automatic Printing Plate Bender APB**
Series: 32-0010.0/0
Starting with device No.: APB-001

Is based on the

- Directive 2004/108/EC of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and the
- Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery and to the amended Directive 95/16/EC

And that the above mentioned electrical operating equipment conforms in its design and construction, as well as the model put into circulation, to the requirements of the named EC Directives. If any modifications are made to the operating equipment without prior approval from the manufacturer, this declaration will lose its validity.

Complete technical documentation is available. A set of operating instructions for the operating equipment is available in both the German (original) and English languages.

Leipzig, 26.01.2017

Dr.-Ing. Jürgen Stopporka
Managing Director



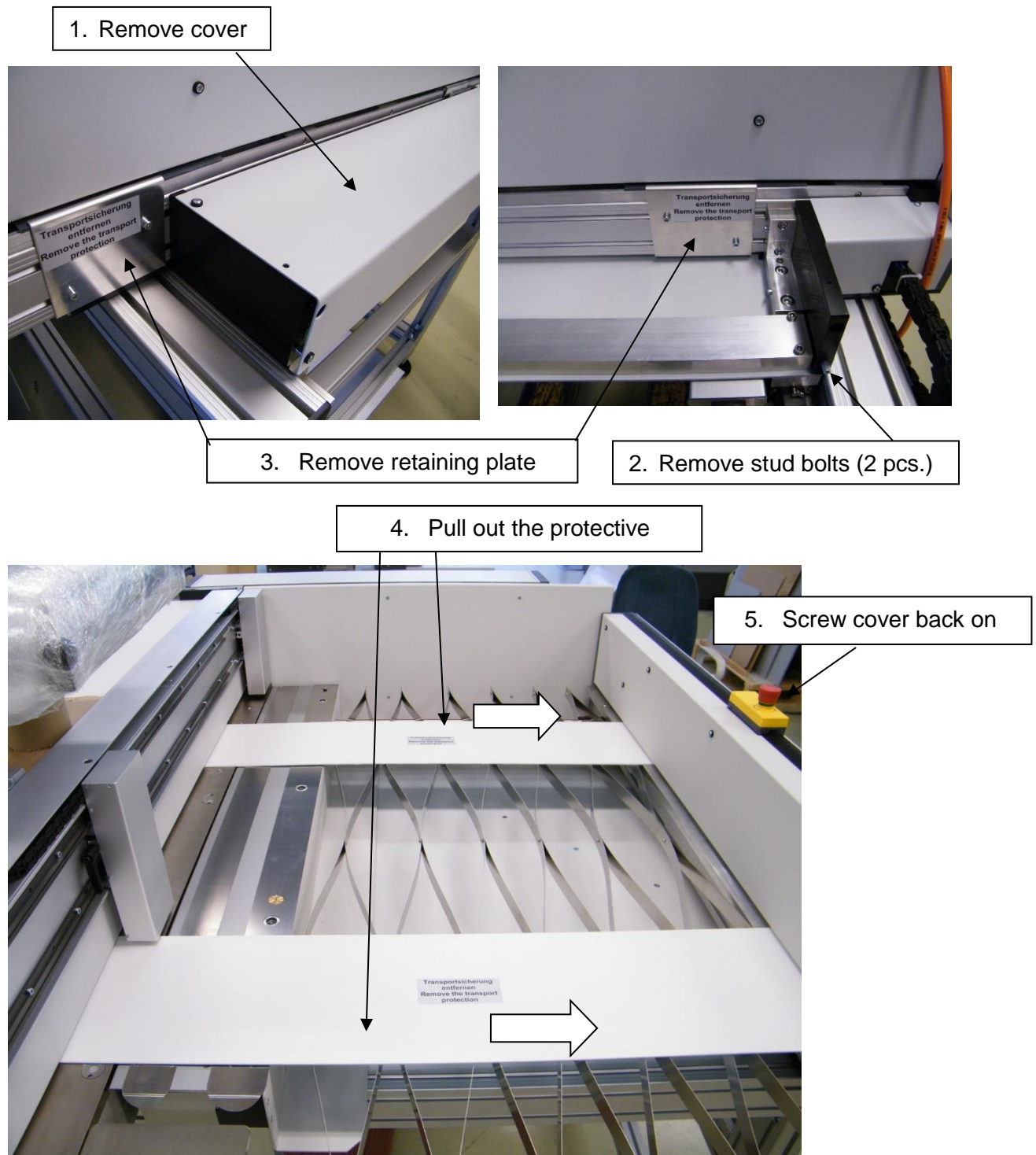
10.3 APPENDIX 3: PLATE BENDER TRANSPORT PACKAGING

The crate can only be opened from this side; the cover is removable. In addition, the red-marked screws are to be removed.

Before lifting the bender out from the transport crate, all screws and fittings between the device and the crate (at the bottom) are to be removed.

The crate is suitable for reuse (renewed transportation).

10.4 APPENDIX 4: REMOVING THE TRANSPORT SECURING DEVICES



When the protective panels are going to be reattached for renewed transportation, take care that these are definitely positioned next to the end stops (verified by maximum insertion depth).



10.5 APPENDIX 5: REALIGNMENT OF THE PRINTING PLATE BENDER

Will be completed by the service personnel of PITSID GmbH upon request.



10.6 APPENDIX 6: READJUSTING THE BENDING PARAMETERS

Will be completed by the service personnel of PITSID GmbH upon request.