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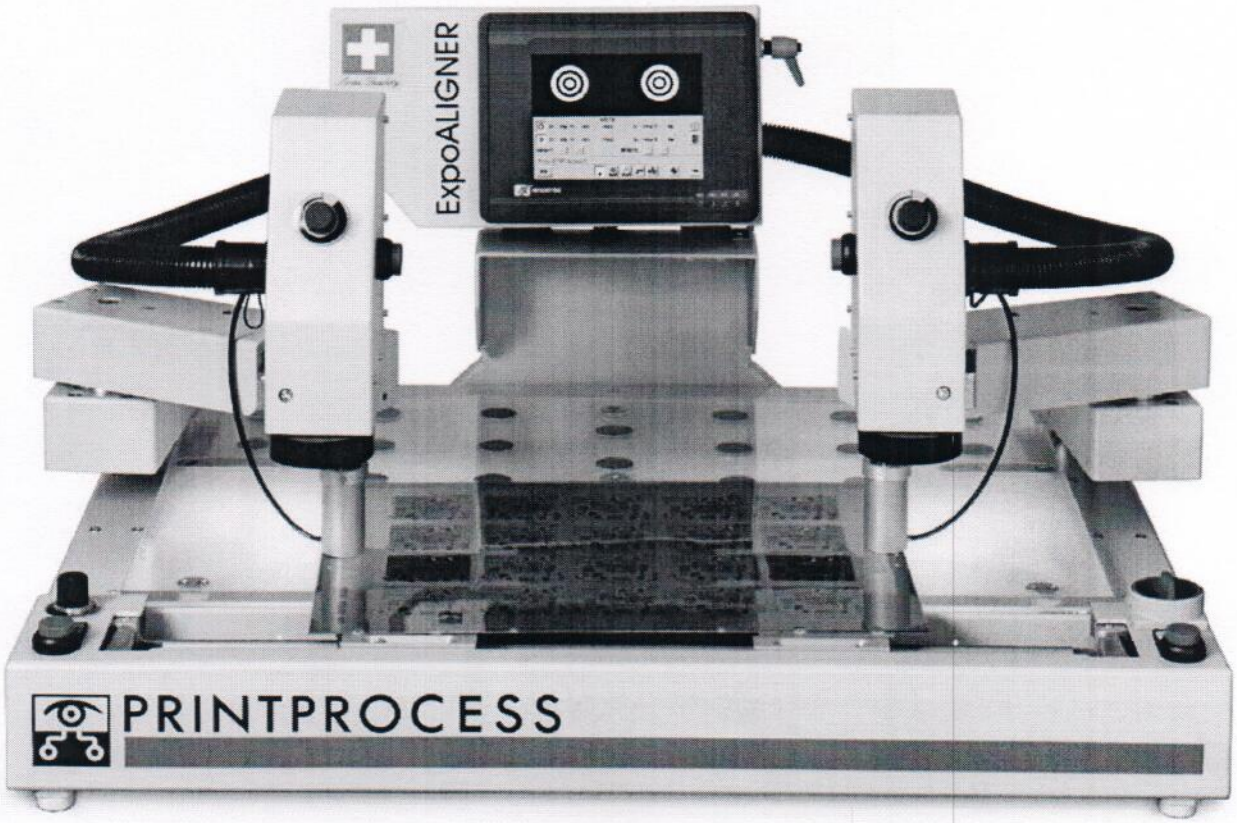
OPERATING MANUAL

ExpoALIGNER



Version 0710

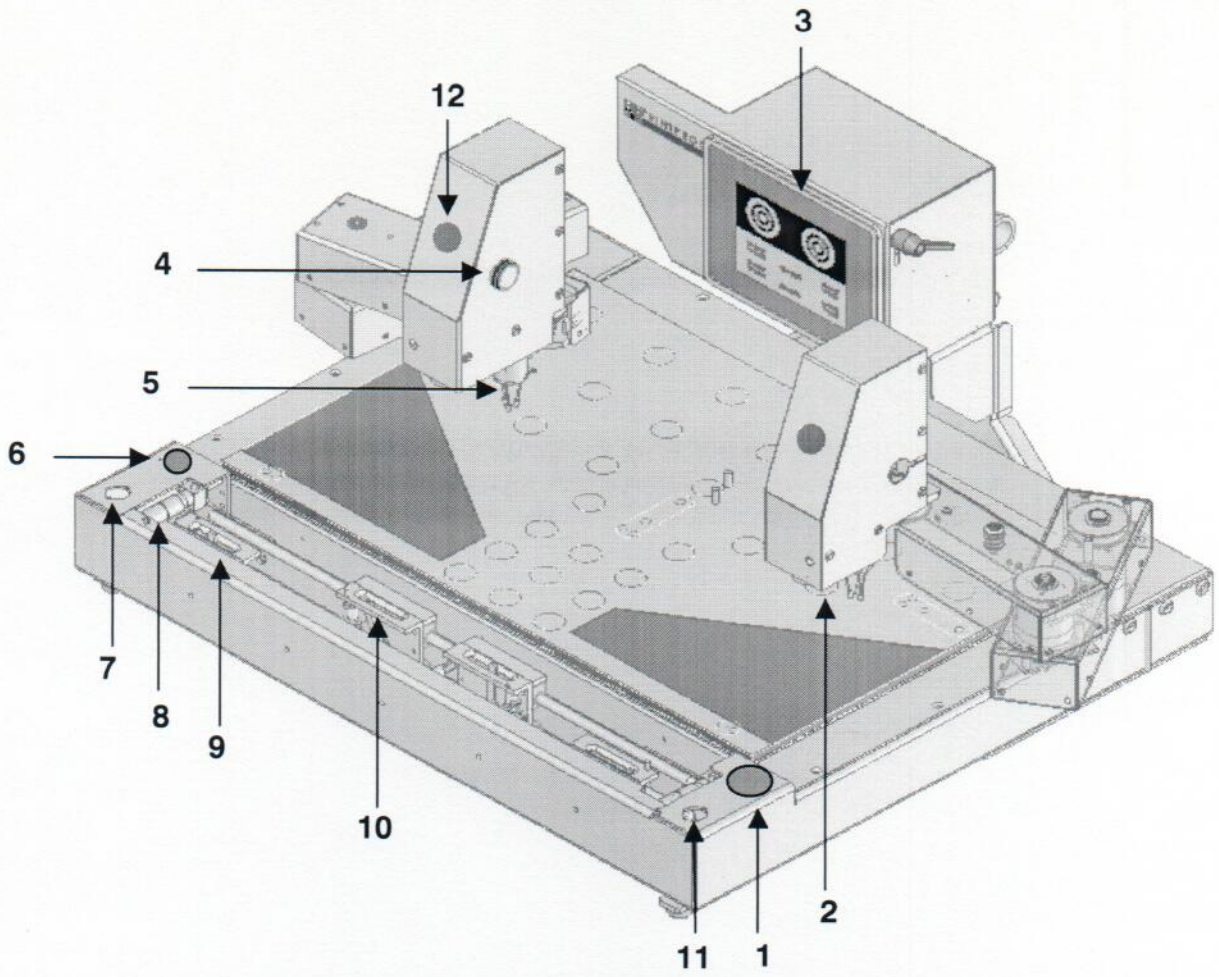
Remark

Important remarks must absolutely be noted

The manufacturer is only liable for safety, reliability and capacity of the machine, as long as the customer has read and understood the operating instructions, otherwise warranty is not applicable.

BEFORE INSTALLATION READ AND ADHERE TO OPERATING- AND SAFETY INSTRUCTIONS

Description of the operating elements

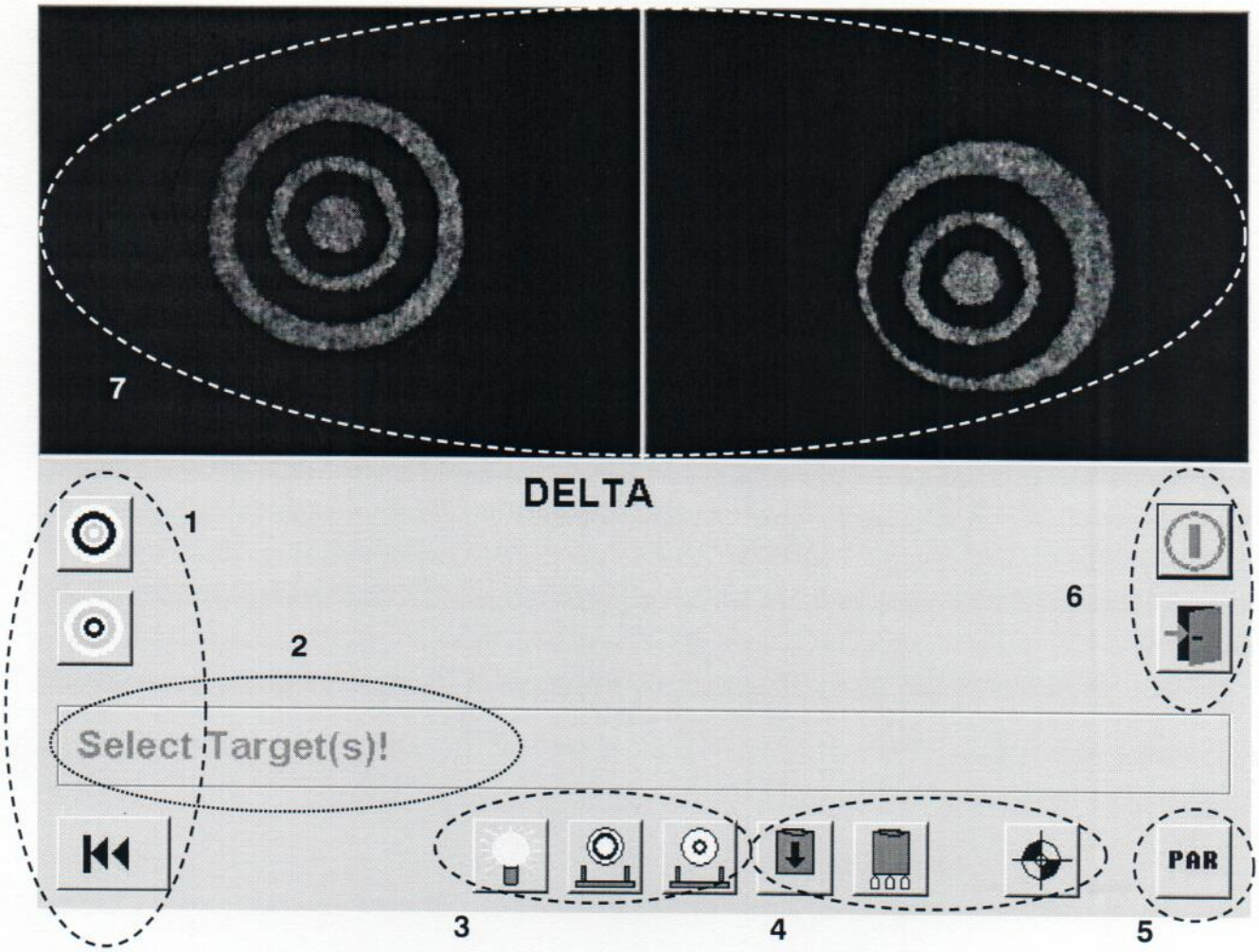


1)	Main switch	**7)**	Check - button
2)	Camera	**8)**	Pin adjustment
3)	Touch-screen	**9)**	Pin block with locking device outer pin pair
4)	Unlocking device - button camera shifting	**10)**	Pin block with locking device inner pin pair
5)	Cylinder with vacuum head	**11)**	Start- button for alignment cycle
6)	Light regulator transmitted light	**12)**	Light regulator auxiliary reflected light

INHALTSVERZEICHNIS

1 Description Operating - Terminal

The operating terminal is divided in following divisions.



1) Working buttons
2) Information field
3) Installation buttons
4) Service buttons
5) Parameter button
6) Switch off buttons
7) Camera field of vision – live picture

1.1 Installation buttons

Selecting the respective installation button the Expoaligner is prepared for a new format size. The pin pairs can be adjusted for a new format after releasing the stop lever. A new working light adjustment as well as the camera position can be newly defined.
If working with a new format size after installation a new calibration has to be carried out.

If no „working button" is selected, after touching this button, the working light is switched on. Afterwards the light intensity can be selected with the light regulator for the required working power.

After selecting this button the respective pin pair will be activated resp. deactivated for the positioning of the lower film (big annulus).
The required pin pairing can be adjusted under „Par".

After selecting this button the respective pin pair will be activated resp. deactivated for the positioning of the upper film (small annulus).
The required pin pairing can be adjusted under „Par"..

1.2 Working buttons

With the working buttons the required alignment cycles are selected, i.e. one side down, one side up or double-sided alignment of films.
The selected alignment cycle is released by touching the start button. The respective working sequence is indicated in the information field with a message. Selecting both buttons it always starts with the lower film (big annulus).

Selecting this button after starting the working cycle it works with the lower film (big annulus).

Selecting this button after starting the working cycle it works with the upper film (small annulus).

Selecting this buttons a started working process will be stopped and jumped to the start of working cycle.

The selected alignment cycle is released by touching the start button. The respective working process is indicated with a message in the information field. By repeated pushing of the start button the working process continues with the next step.

If before terminating the last working process (drive back of vacuum head) the check button is pressed, a repeated measure- and alignment cycle will be released.

1.3 Switch off buttons

Before switching off the ExpoALIGNER with the main switch, the computer must be shut down beforehand.

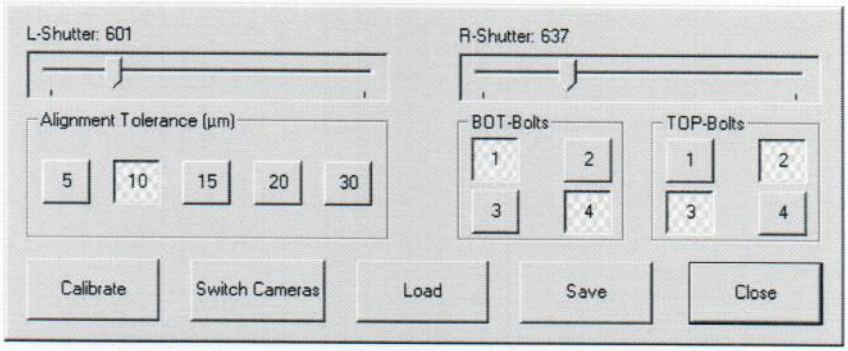
Selecting this button the computer is shutting down. After appearing of the message „its save now to turn off the computer" the ExpoALIGNER can be switched off with the main switch.

Selecting this button you arrive to the "Desktop" surface of the computer.

1.4 Parameter buttons

With the parameter button normally singular system adjustments are made.
After switching from a big to a smaller working format or opposite, a calibration of the positioning motors have to be done.

After selecting the button „Par" the following window opens.



Alignment tolerance

Within this alignment tolerance the positioning process film to panel will be terminated.
After changing the tolerance the new indication has to be saved.

BOT- Bolts

Selecting the respective button, by positioning, work is done with the lower film (big annulus), with the adjusted pin pair.
Processing prototypes and not punched films, the pins can be completely deactivated.
After changing the pin pairing a new indication has to be saved.

TOP- Bolts

Selecting the respective button by positioning, work is done with the upper film (small annulus), with the adjusted pin pair.
After changing the pin pairing a new indication has to be saved.

Calibrate

Since the positioning motors are placed at the outer stage of the table, the number of steps per mm in Y- direction is depending on the format size, i.e. small format higher number of steps. Bigger format smaller number of steps.
Are the cameras shifted from a smaller format to a big format or opposite, a calibration of the alignment system has to be done.

Save

After a change of the alignment tolerance of the pin pairing or after a calibration, the new indication has always to be saved with the button „Save".

Close

Closes the parameter window

2 Procedure to work

2.1 Format installation

The offset pins serve mainly to the correct positioning of the films and registration marks to the CCD camera by laying up the PCB boards. During alignment the pins are discharged downwards. By a parallel selection of the pin pairing, work can be done without position protection. Using a diagonal pin pairing, as well as a respective adjustment of an offset with the pin adjustment, a respective position protection is secured. How big the offset as position protection can be, please take it from the drawing (annex of this operating manual).

2.1.1 Procedure to install

- With the installation buttons select the required pin pairs and working light.
- Loosen the detention lever of selected pin pair and adjust the pin blocks on the new pin hole drillings. Thereby the PCB boards should be centered to the machine middle axis.
- Lay up PCB board and the punched film and adjust both CCD - cameras on the registration marks by activating the release button.
- With the respective light regulator set up the light power in such a way that the bright circular areas in the range of the registration marks are shown light grey on the screen. By non transparent materials it has to be worked with the auxiliary reflected light.
- Remove PCB board and film and lock pin block.
- Set back installation buttons.
- Same procedure for the second pin pair resp. the reverse side of the PCB board. Pay attention that the registration marks of the reverse side come to rest in the field of vision.

2.2 Format calibration

Are the cameras moved from a smaller format to a big format or opposite, always a calibration of the alignment system has to be done.

2.2.1 Procedure for calibration

- Set up format
- Select required pin pair and lay up PCB board correctly without film.
- Deselect pin pair and open with button „PAR“ the parameter window.
- Pressing the button „Calibrate“ the calibration starts.
- After termination of the calibration a respective message in the information field appears Pressing the button „Save“ the calibration terminates.
- Pressing the button „Close“ the parameter window closes. The ExpoALIGNER is ready to operate.

2.3 Working

The ExpoALIGNER can work with various alignment accuracies ±5, ±10, ±15 or ±30. The required alignment accuracy can be selected in the parameter window and changed at any time.
It can work with single-sided or double-sided alignment of films.
After respective selection of the required kind of procedure the single working processes are supported with a message in the information field.

2.3.1 Procedure to work

- Set up format and possibly calibrate.
- Deactivate all installation and service buttons.

The message ***„Select Target(s)!"*** appears in the information field for the start position.

1. With working buttons select the required alignment.
2. By shortly pressing the start button, the respective pins are activated.
   Message: ***„insert PCB +.... film – press start to align"***
3. Input correctly PCB board and the punched film and press repeatedly shortly the start button. The automatic alignment cycle is started.
   Message: ***„aligning .... film – please wait"***

After alignment has taken place appears the message ***„aligning OK – fix film – press start to continue, Check to realign"***

4. Fix aligned film above the punched openings on the board.
5. By short pressing of the start button the vacuum extractors are loosened and the board released.

By single-sided alignment the Expoaligner stands in home position and the board can be removed.

Selecting both annulus the board is being turned with the glued film and processed with points 2-5.

2.4 Terminate work / Switch off

Before switching off the ExpoALIGNER with the main switch, the computer must be shut down beforehand.

2.4.1 Procedure

- Pressing the Switch off button on the operating terminal the computer shuts down.
- After appearing the message ***„its save now to turn off the computer"*** the Expoaligner can be switched off with the main switch.

3 Service and special functions

3.1 Service buttons

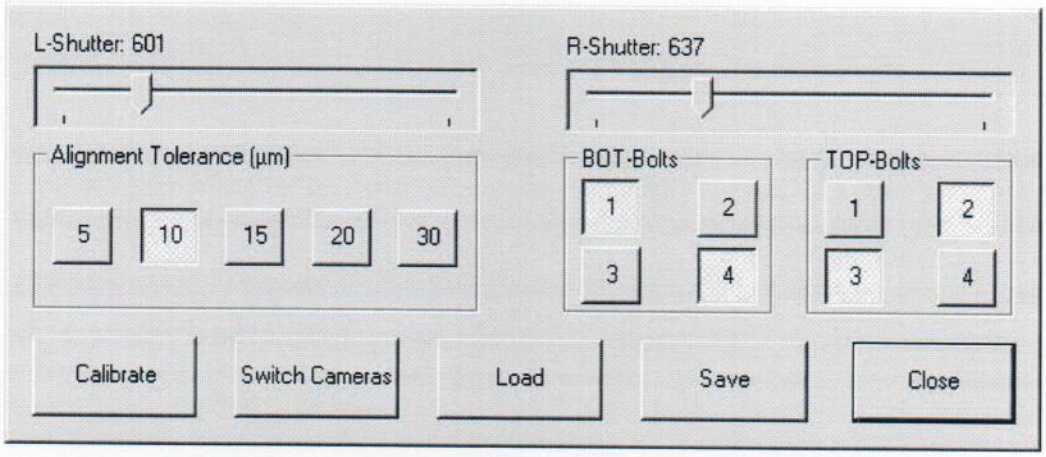
With the service buttons single functions can be released.

Selecting this button the cylinder with the vacuum head is lowered resp. driven back.

Switches the vacuum On- and Off on the vacuum head

Selecting this button a reference drive of all three positioning motors are released, i.e. they drive to its middle position.

3.2 Special functions



Switch Camera

With this button both camera inputs can be reversed on the computer „Software technically realisable".

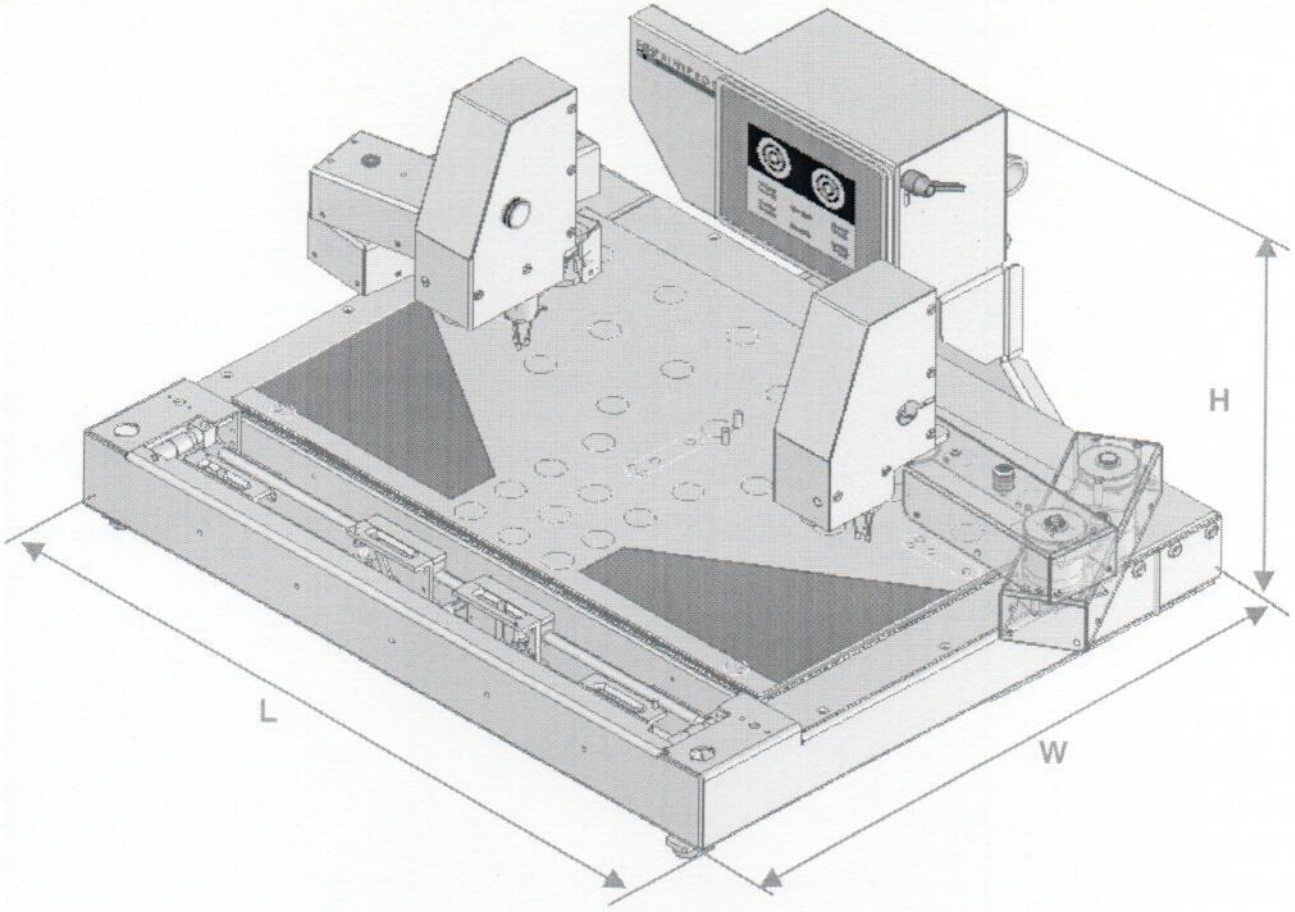
Load

Wurden Parameter verändert ohne diese zu speichern, werden nach betätigen des Buttons „Load" die geänderten Parameter auf den letzten gespeicherten Parameter zurückgesetzt.

Shutter

Is the light adjustment on the transmitted light regulator insufficient, it can be readjusted by changing the camera locks on the roll bars L- Shutter and R- Shutter.

4 Specifications and technical data

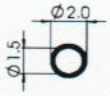
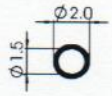
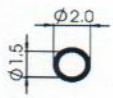
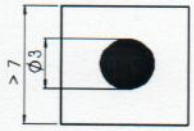
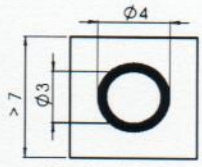


4.1 Technical Data

Dimensions L x W x H	775 x 700 x 430
Weight	Approx. 45 Kg
Air pressure	min. 6 bar 35 Nl/min Tube outer ∅ 8 mm. (filtered air pressure)
Operating voltage	**230 V 50 Hz 6 A 1 / N / PE**

5 Specification Films / Boards

Pin hole ø 3.0

	Inner Layer	Outer Layer	Soldermask
Artwork top	Target ø 0.8 (5:1) 	Target ø 0.8 (5:1) 	Target ø 0.8 (5:1) 
Artwork bottom	Target ø 2.0 (5:1) 	Target ø 2.0 (5:1) 	Target ø 2.0 (5:1) 
Artwork top and bottom	Target blank etching (5:1)  Blank etching for transmitted light Solder mask	Target blank etching (5:1)  Blank etching for soldermask **transmitted light**	
		Target ø 3 (5:1)  Blank etching for soldermask **reflected light**	

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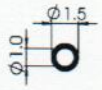
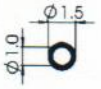
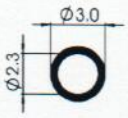
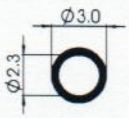
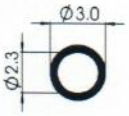
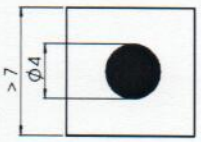
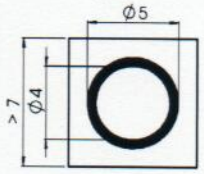
Pin hole ø 4.0

	Inner Layer	Outer Layer	Soldermask
Artwork top	Target ø 1.5 (5:1) 	Target ø 1.5 (5:1) 	Target ø 1.5 (5:1) 
Artwork bottom	Target ø 3.0 (5:1) 	Target ø 3.0 (5:1) 	Target ø 3.0 (5:1) 
Artwork top and bottom	Target blank etching (5:1)  Blank etching for transmitted light Solder mask	Target blank etching (5:1)  Blank etching for soldermask **transmitted light**	
		Target ø 4.0 (5:1)  Blank etching for soldermask **reflected light**	

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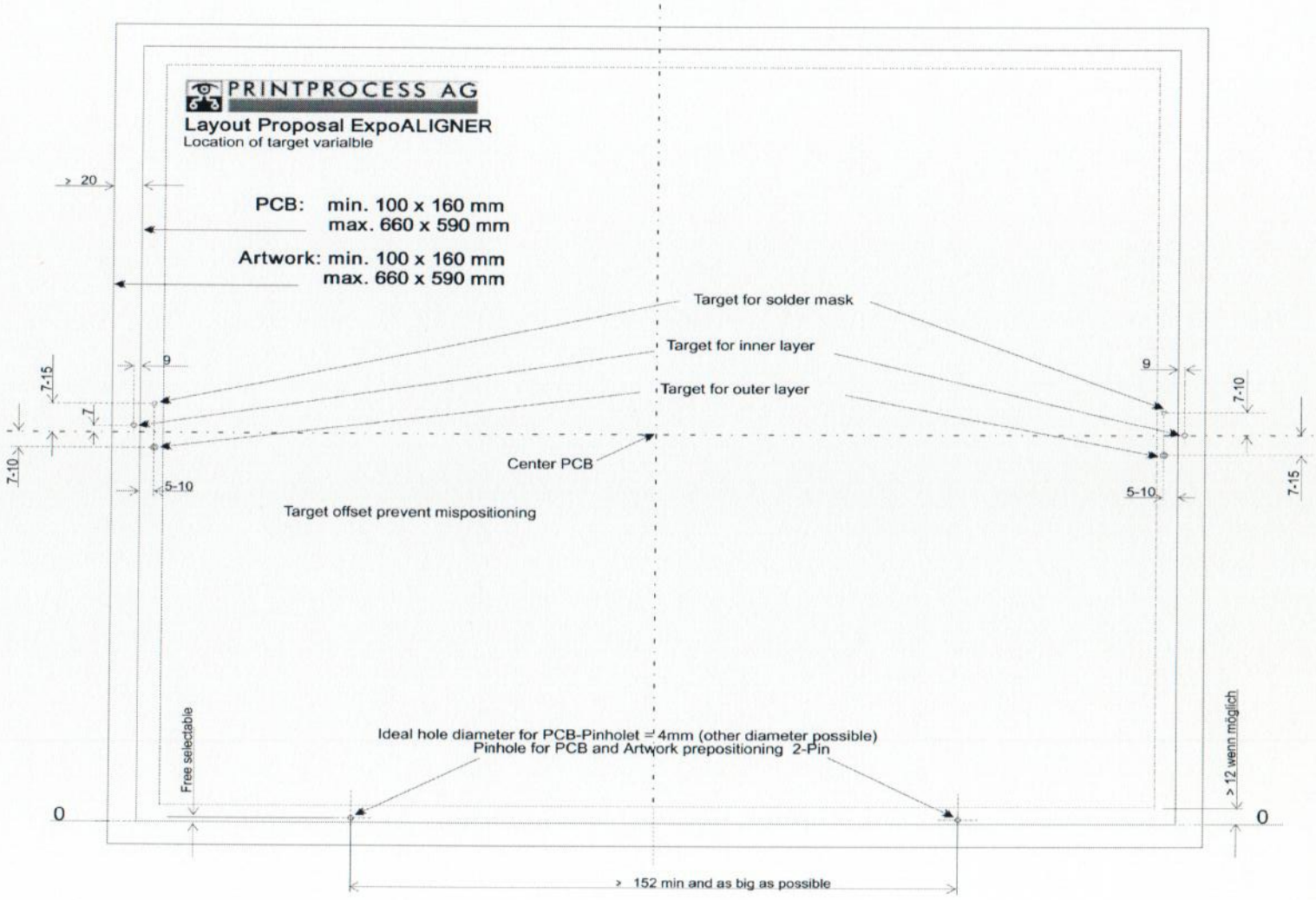
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Layout Proposal ExpoALIGNER
Location of target varialble
PCB: min. 100 x 160 mm
max. 660 x 590 mm
Artwork: min. 100 x 160 mm
max. 660 x 590 mm
≥ 20
Target for solder mask
Target for inner layer
Target for outer layer
9
9
7-15
7-10
7
7-10
7-15
Center PCB
5-10
5-10
Target offset prevent mispositioning
Free selectable
Ideal hole diameter for PCB-Pinholet = 4mm (other diameter possible)
Pinhole for PCB and Artwork prepositioning 2-Pin
≥ 12 wenn möglich
0
0
≥ 152 min and as big as possible