



ACCURATE **PRINTING** MACHINES

FOR ELECTRONIC ASSEMBLY

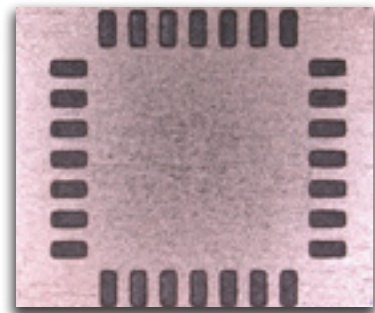
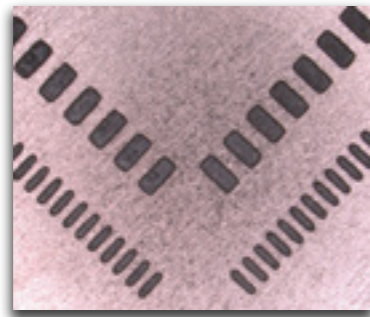


[www.pbt-works.com](http://www.pbt-works.com)

## QUALITY PRINT DOES MATTER

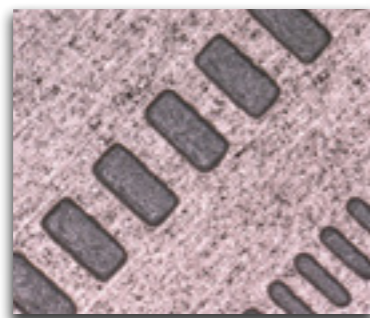
### WHY...

- ◆ choose PBT printer?



### BECAUSE...

- ◆ we understand print.



### DO...

- ◆ print accurately.

- ◆ Designed to print SMD Solder Paste and SMD Glue on small to medium series of PCBAs
- ◆ Capable to print pads for all currently used component packages, including small chips - 0201, micro BGA, QFN as well as large thermo-transfer central pads
- ◆ Proved by thousands of users as affordable, easily operated but accurate stencil printers for prototyping and small to medium size production

- ◆ PBT established in 1992
- ◆ More than 3000 printer installations worldwide
- ◆ Over 70 employees
- ◆ 2500 m2 of company facility
- ◆ ISO 9001 and ISO 14001 certification for production and design

- ◆ Complete pre-assembly manufacturing
- ◆ Entire machine assembly and final quality check within our company

- ◆ Own design team converts research ideas into the most up-to-date equipment
- ◆ Complete in-house mechanical, hardware and software design
- ◆ Flexibility to meet specific customer requirements

- ◆ Global sales and service network of over 40 partner companies



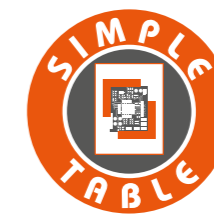
- ◆ Single-Sided Print
- ◆ Thin and Flexible Substrates
- ◆ Grid of vacuum holes
- ◆ Corner restrains



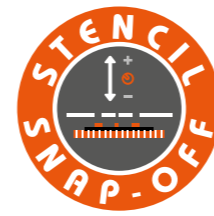
- ◆ Double-Sided Print
- ◆ Quick Adjustment
- ◆ Full set of magnetic tooling
- ◆ Thickness adjustable support bars
- ◆ Hole and edge pins
- ◆ Bottom pins and vacuum cups



- ◆ Single-Sided Print
- ◆ Thin and Flexible Substrates
- ◆ Quick Adjustment
- ◆ Grid of vacuum holes
- ◆ Side pin restrains in slots



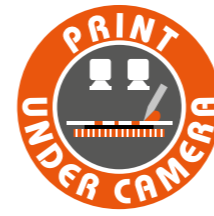
- ◆ Single-Sided Print
- ◆ Simple flat table
- ◆ Corner restrains



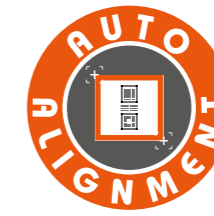
- ◆ Parallel Motion for Perfect Print
- ◆ Adjustable separation speed
- ◆ Adjustable snap-off distance
- ◆ Adjustable table-to-stencil stretch
- ◆ Double table speed



- ◆ Optimal Paste Print
- ◆ Squeegee speed
- ◆ Print stroke
- ◆ Squeegee pressure



- ◆ Direct Print After Alignment
- ◆ Through-stencil view technology
- ◆ No movement of table after alignment
- ◆ High resolution dual cameras
- ◆ LED illumination of target area
- ◆ Laser aid for camera positioning



- ◆ Automatic Stencil-to-Board Alignment
- ◆ Through-stencil view technology
- ◆ Servo table drive
- ◆ Use of square solder pads or fiducials



- ◆ Various Squeegee Sizes and Blades
- ◆ Metal blades
- ◆ Rubber blades
- ◆ Integrated paste deflectors
- ◆ Customized squeegees



- ◆ Matching Various Tensioning Frames
- ◆ LPKF Zelflex
- ◆ DEK VectorGuard
- ◆ LTC QUATTRO-FLEX
- ◆ PBT original frame



- ◆ Easy Squeegee Replacement
- ◆ No tool needed
- ◆ Quick exchange
- ◆ Easy cleaning



- ◆ Small Footprint
- ◆ Long-Term Durability
- ◆ Robust framework
- ◆ Solid design proven by decades



- ◆ Servo-Driven Frame Opening
- ◆ Comfortable opening at any angle
- ◆ Independent of frame weight
- ◆ Easy underside wiping



- ◆ Unique Telescopic Table Drawer
- ◆ Quick PCBA Exchange
- ◆ Integrated Underside Wiping



# PRINTING MACHINES OVERVIEW



		23" PRINTERS		≥ 29" PRINTERS	
		FA23	Go23	Go29	GoLED
<b>PRINTING DATA</b>					
Stencil frame size (WxLxH) mm (orientation: W-left/right, L-front/rear, H-at clamping)	Max	584 x 680 x 40	610 x 650 x 33	762 x 780 x 40	1500 x 600 x 40
	Min	584 x 584 x 18	300 x 300 x 18	300 x 300 x 25	300 x 300 x 25
Stencil frame weight	Max	No limit	8 kg	8 kg	10 kg
Board size (WxL) mm	Max	460 x 410	510 x 420	620 x 550	1400 x 420
	Min	50 x 60	50 x 60	50 x 60	50 x 60
Board thickness (adjusted) mm	Max	4	4	4	4
	Min	0.5	0.5	0.5	0.5 (thinner board on request)
Print area (mm)	Max	410 x 390 (standard) 440 x 390 (on request)	440 x 400 (standard) 480 x 400 (on request)	600 x 540	1200 x 350 (standard) 1200 x 410 (on request)
	Component height (mm)	Max	63.5	23.5	23.5
Printing accuracy		±20 µm in 3δ (FA23)			
Print capability		01005 (0402 metric) chip	01005 (0402 metric) chip	01005 (0402 metric) chip	0402 (1005 metric) chip
Typical cycle time (without printing)		10 - 20 s			
<b>PROGRAMMABLE PARAMETERS</b>					
Print pressure (manual control)		1-5 bar (10 – 140 N)	2-5 bar (40-120 N)	2-5 bar (40-120 N)	2-5 bar (40-100 N)
Print pressure (electronic control)		1-3 N/cm			
Separation speed control		0.1 - 3.5 mm/s	0.5-6 mm/s	0.5-6 mm/s	0.5-6 mm/s
Print speed range		10 – 99 mm/s	20-150 mm/s	20-150 mm/s	30-200 mm/s
<b>ALIGNMENT CONDITIONS</b>					
Alignment solder pad shape		square or rectangle with max. rate 2:1			
Table X/Y alignment		X, Y ±5 mm, θ (+/- 2.5°)	X, Y ±10 mm, θ ±3°	X, Y ±10 mm, θ ±3°	X, Y ±10 mm, θ ± 1.5°
<b>INSTALLATION DATA</b>					
Machine dimension (mm)		860 (+448 control console) x 846 x 1416	745 x 985 x 695	895 x 1135 x 695	1730 x 930 x 720
Weight		220 kg	100 kg	128 kg	160 kg
Power supply		230 V/50 Hz, 150 VA			
Compressed air (oil free air)		0.6 – 0.80 Mpa			
Control system		PC with Windows	PLC Touchscreen	PLC Touchscreen	PLC Touchscreen

◆ Actual configuration and features may vary depending on design and innovation



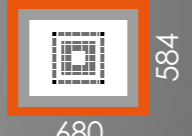
		20-23" MANUAL PRINTERS		
		UNIPRINT	UNIPRINT P	UNIPRINT P 300
<b>PRINTING DATA</b>				
Frame size (WxLxH) mm (orientation: W-left/right, L-front/rear, H-at clamping)	Max	415 x 500 x 33 or 438 x 476 x 33	608 x 608 x 33	608 x 608 x 33
	Min	220 x 310 x 18	370 x 280 x 18	370 x 280 x 18
Stencil frame weight	Max	5 kg	8 kg	8 kg
Board size (WxL) mm	Max	320 x 300	410 x 405 (standard) 450 x 450 (on request)	410 x 405 (standard) 500 x 500 (on request)
	Min			
Board thickness (adjusted) mm	Max	1.5	1.5	300
	Min	1 (thinner board on request)	1 (thinner board on request)	1
Print area (mm)	Max	290 x 265 (standard) 290 x 280 (on request)	390 x 355 (standard) 420 x 370 (on request)	390 x 355 (standard) 420 x 370 (on request)
	Component height (mm)	Max	23.5 (only M table)	23.5 (only M table)
Printing accuracy				
Print capability		01005 (0402 metric) chip	01005 (0402 metric) chip	0402 (1005 metric) chip
Typical cycle time (without printing)				
<b>PROGRAMMABLE PARAMETERS</b>				
Print pressure (manual control)		10–50 N		
Print pressure (electronic control)				
Separation speed control		1-6 mm/s (with lift)		
Print speed range				
<b>ALIGNMENT CONDITIONS</b>				
Alignment solder pad shape				
Table X/Y alignment		X, Y ±6 mm, θ +/-2.5°	X, Y ±6 mm, θ +/-2.5°	X, Y ±6 mm, θ ±2.5°
<b>INSTALLATION DATA</b>				
Machine dimension (mm)		464 x 702 x 235 (360 with guided squeegee)	700 x 806 x 235 (350 with guided squeegee)	767 x 806 x 555 (630 with guided squeegee)
Weight		23 kg (28 kg with guided squeegee)	32 kg (38 kg with guided squeegee)	39 kg (45 kg with guided squeegee)
Power supply				
Compressed air (oil free air)		0.6 – 0.80 Mpa		
Control system				






### APPLICATION

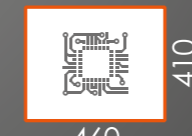
- ◆ Small to middle series production
- ◆ Printing solder paste
- ◆ Printing SMD glue
- ◆ Printing thermoconductive paste
- ◆ Print on ceramics, foils, metals



680  
584  
**MAX  
STENCIL SIZE**



410  
390  
**MAX  
PRINT AREA**



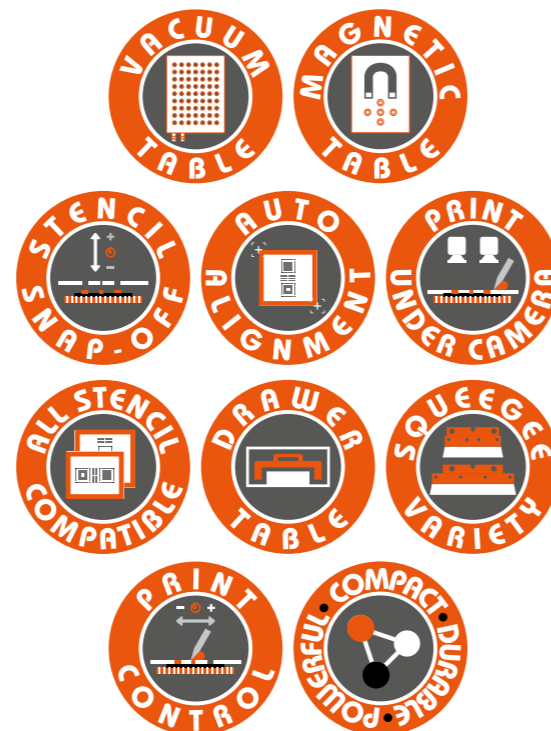
460  
410  
**MAX  
PCB SIZE**

### UNIQUE FEATURES

- ◆ Quick PCB changes due to convenient drawer
- ◆ Fast product changeover
- ◆ Manual or automatic camera guided stencil to pad alignment
- ◆ Digital filtration of unwanted reflections or shapes on the pads chosen for alignment
- ◆ X, Y, Theta playless table adjustment
- ◆ Quick stencil clamping by pneumatic fixation
- ◆ Three-position squeegee height control for quick stencil changes
- ◆ Magnetic or Vacuum table option
- ◆ Complete set of magnetic PCB tooling
- ◆ Support bars adjustable to PCB thickness
- ◆ B-side print up to A-side component height 63,5 mm
- ◆ Particularly smooth pneu-hydraulic synchronized table separation motion
- ◆ Integrated underside cleaning system

### CONTROL SYSTEM

- ◆ Control SW based on Windows OS
- ◆ Programmable print speed and adjustable squeegee range
- ◆ Programmable printing pressure control
- ◆ Adjustable board from stencil separation speed
- ◆ Adjustable separation distance
- ◆ Adjustable upper position of the table
- ◆ Possibility of logging all process parameters



### AUTOMATIC ALIGNMENT SYSTEM

- ◆ Stencil-to-board automatic alignment system with unique through-stencil view technology
- ◆ Two fixed cameras can be positioned over any suitable position of the print area
- ◆ System can use square solder pads or printable fiducials
- ◆ Alignment system also accepts reduced apertures
- ◆ No table movement after alignment
- ◆ Keeps the accurate position independent on physical and climatic influence
- ◆ Vision process uses image analysis of pad edges
- ◆ Integrated optical filter for surface irregularity



### ESSENTIALS

- ◆ Variety of PCB support for easy board fixation
- ◆ Rigid body for accuracy
- ◆ Drawer with underside cleaning
- ◆ Selection of squeegees
- ◆ Squeegee height control





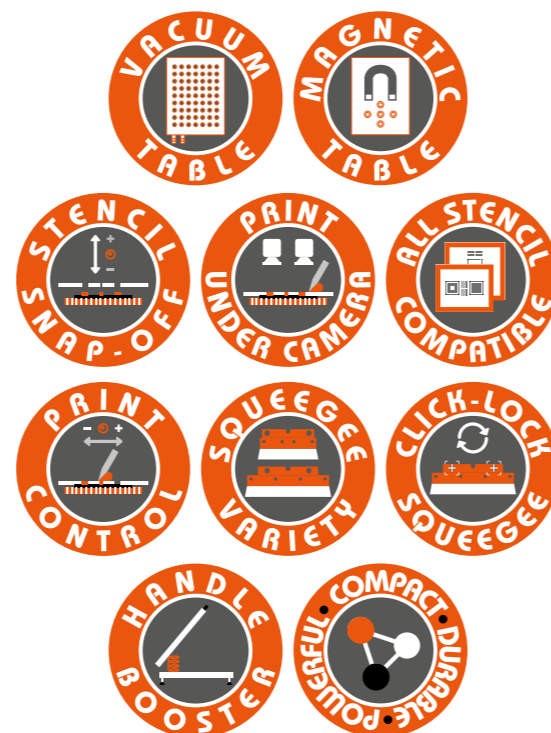
### APPLICATION

- ◆ Small series production
- ◆ Prototyping and new product development
- ◆ Printing solder paste
- ◆ Printing SMD glue
- ◆ Printing thermoconductive paste
- ◆ Screen printing of inks
- ◆ Thick film printing, printed electronics screen print
- ◆ Print on ceramics, foils, metals

650 610 MAX STENCIL SIZE	440 400 MAX PRINT AREA	510 420 MAX PCB SIZE

### UNIQUE FEATURES

- ◆ Smart & compact design
- ◆ For stencils up to width 23"
- ◆ Quick PCB changes
- ◆ Fast product changeover
- ◆ Camera guided stencil to PCB alignment
- ◆ X, Y, Theta playless table adjustment
- ◆ Servo-driven frame opening
- ◆ Flexible stencil clamping for stencils of various width
- ◆ Stencil clamping with pneumatic fixation
- ◆ Three position squeegee height control for quick stencil changes
- ◆ Unique no-tool squeegee exchange
- ◆ Complete set of magnetic PCB tooling
- ◆ Support bars adjustable to PCBA thickness
- ◆ B-side print up to A-side component height 23,5 mm
- ◆ Optional vacuum table with vacuum pump
- ◆ Rigid metal stand included



### CONTROL SYSTEM

- ◆ PLC control system with touchscreen
- ◆ Adjustable printing pressure
- ◆ Programmable board from stencil separation distance and speed
- ◆ Robust synchronized table separation motion
- ◆ Programmable print speed and squeegee range

### GO PRINTER IN DETAIL

- ◆ Extra wide opening angle for easy stencil cleaning and tooling adjustment
- ◆ Pneumatic lock of print frame
- ◆ Easy opening with pneumatic servo-system, stops at any angle
- ◆ Easy access to printing area for solder paste application
- ◆ Frame clamping with adjustable width + no adapters needed
- ◆ Fast squeegee exchange - no tool needed
- ◆ Minimal pitch of squeegee edges
- ◆ Automatic squeegee lift for frame exchange and paste refill
- ◆ Laser-guided and movable vision system for quick setup
- ◆ Fast board changeover. Only partial opening needed for handling
- ◆ Adjustable magnetic board support tooling
- ◆ Fine control of snap-off process (speed, uniformity)
- ◆ Rigid metal stand as standard



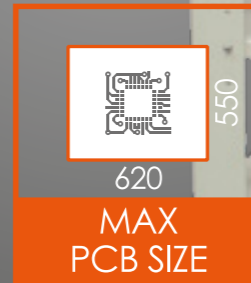
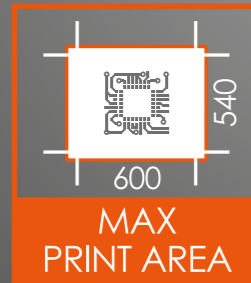
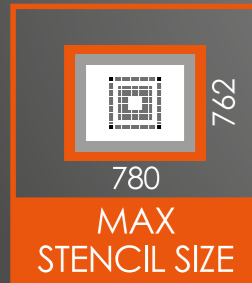
### PLC CONTROL WITH TOUCHSCREEN AND PROGRAMMING

SETUP / MANUAL				MENU
SQ REAR POSITION:	400	THICKNESS BOARD:	4.0	▲
SQ FRONT POSITION:	0	OVERLAP STENCIL POS:	1.5	
PRINT SPEED:	150	SNAP-OFF SPEED:	6	▼
PRINT STROKE N°:	10	SNAP-OFF DISTANCE:	2.0	
SQUEEGEE HOME POSITION		TABLE HOME POSITION		FRAME POSITION:
SQ REAR	SQ UP	TABLE UP	☐	
SQ FRONT	SQ 1	TABLE DOWN	☐	



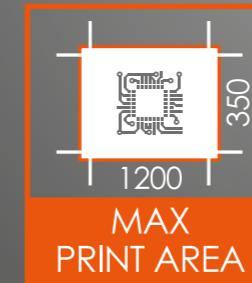
### APPLICATION

- ◆ Small series production
- ◆ Prototyping and new product development
- ◆ Printing solder paste
- ◆ Printing SMD glue
- ◆ Printing thermoconductive paste
- ◆ Screenprinting of inks
- ◆ Thick film printing, printed electronics screenprint
- ◆ Print on ceramics, foils, metals



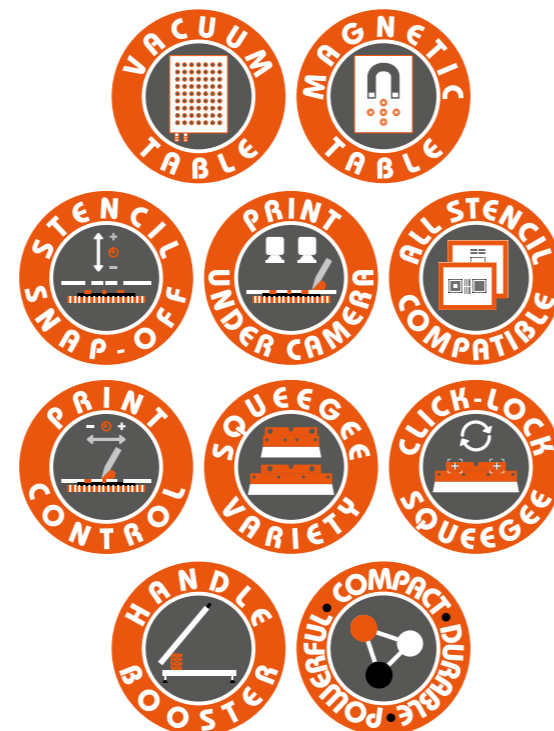
### APPLICATION

- ◆ Small to middle series production
- ◆ LED panels and large DPS formats
- ◆ Printing solder paste
- ◆ Printing SMD glue
- ◆ Printing thermoconductive paste
- ◆ Print on ceramics, foils, metals



### UNIQUE FEATURES

- ◆ Smart & compact design
- ◆ For stencils up to width 29"
- ◆ Quick PCB changes
- ◆ Fast product changeover
- ◆ Camera guided stencil to PCB alignment
- ◆ X, Y, Theta playless table adjustment
- ◆ Servo-driven frame opening
- ◆ Flexible stencil clamping for stencils of various width
- ◆ Stencil clamping with pneumatic fixation
- ◆ Three position squeegee height control for quick stencil changes
- ◆ Unique no-tool squeegee exchange
- ◆ Complete set of magnetic PCB tooling
- ◆ Support bars adjustable to PCBA thickness
- ◆ B-side print up to A-side component height 23,5 mm
- ◆ Optional vacuum table with vacuum pump
- ◆ Rigid metal stand included

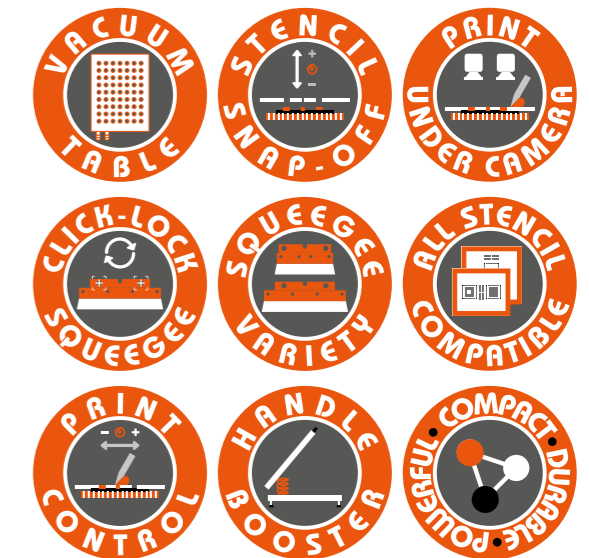


### CONTROL SYSTEM

- ◆ PLC control system with touchscreen
- ◆ Adjustable printing pressure
- ◆ Programmable board from stencil separation distance and speed
- ◆ Robust synchronized table separation motion
- ◆ Programmable print speed and squeegee range

### UNIQUE FEATURES


- ◆ Smart & compact design
- ◆ For stencils up to width 1500 mm
- ◆ Quick PCB changes
- ◆ Fast product changeover
- ◆ Camera guided stencil to PCB alignment
- ◆ X, Y, Theta playless table adjustment
- ◆ Servo-driven frame opening
- ◆ Flexible stencil clamping for stencils of various width
- ◆ Stencil clamping with pneumatic fixation
- ◆ Rubber based vacuum table with optional vacuum pump
- ◆ Three position squeegee height control for quick stencil changes
- ◆ Unique no-tool squeegee exchange
- ◆ Rigid metal stand included




### CONTROL SYSTEM

- ◆ PLC control system with touchscreen
- ◆ Adjustable printing pressure
- ◆ Programmable board from stencil separation distance and speed
- ◆ Robust synchronized table separation motion
- ◆ Programmable print speed and squeegee range

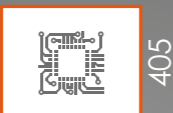




608  
608  
**MAX STENCIL SIZE**



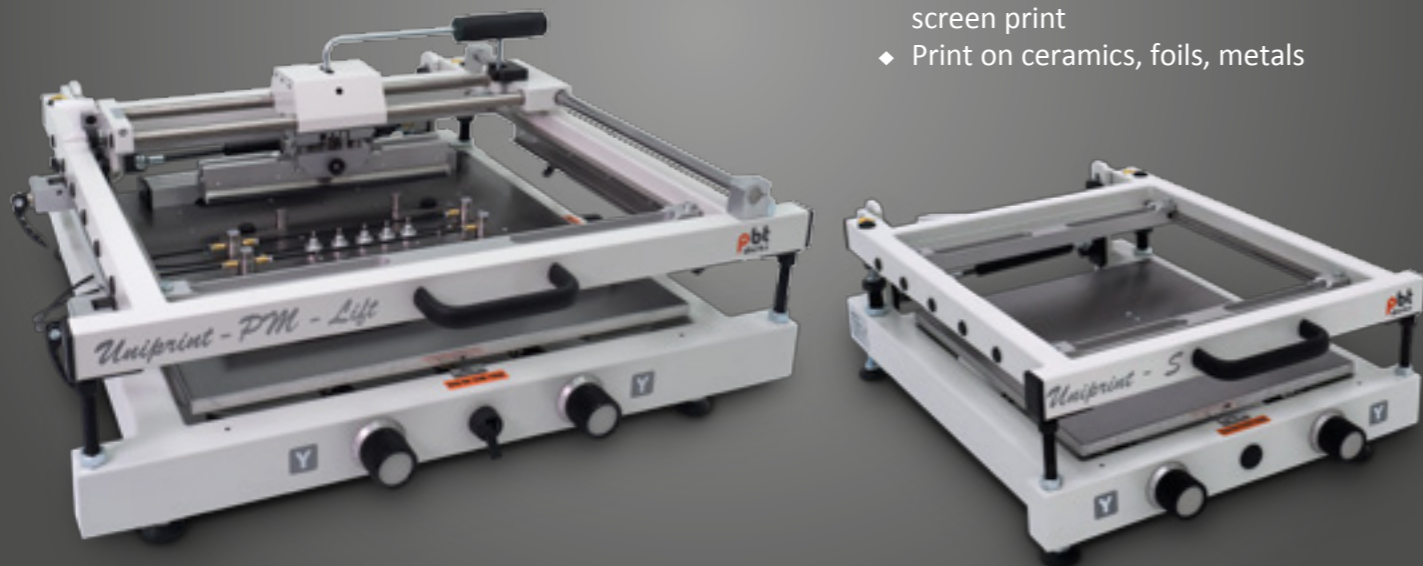
390  
355  
**MAX PRINT AREA**



410  
405  
**MAX PCB SIZE**

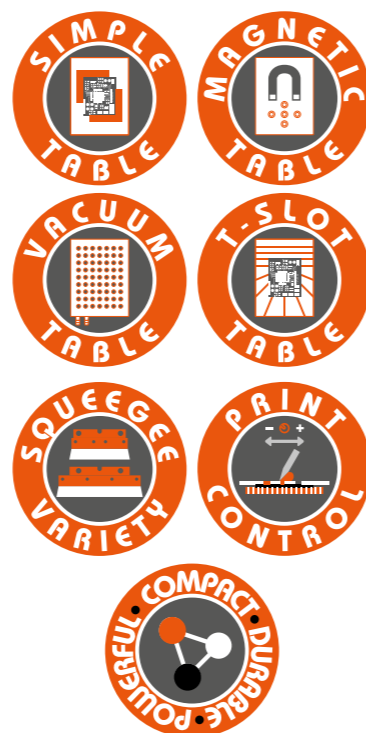
### APPLICATION

- ◆ Prototyping, laboratory, new product development
- ◆ Printing solder paste
- ◆ Printing SMD glue
- ◆ Printing thermoconductive paste
- ◆ Screen printing of inks
- ◆ Thick film printing, printed electronics screen print
- ◆ Print on ceramics, foils, metals



### UNIQUE FEATURES

- ◆ Compact size and small footprint
- ◆ Standard size UniPRINT
- ◆ Large size UniPRINT P
- ◆ Smart modular design
- ◆ Quick PCB changes
- ◆ Rigid framework
- ◆ Fast product changeover
- ◆ X, Y, Theta playless table adjustment
- ◆ Optional pneumatic separation - LIFT
- ◆ Balanced upper frame opening
- ◆ Optional guided dual squeegee system
- ◆ Various types of stencil clamping
- ◆ Selection of various table types
- ◆ B-side print up to A-side component height 23,5 mm (M-table)
- ◆ Table top or optional rigid metal stand



### CONTROL ADJUSTMENT

- ◆ Independent adjustable printing pressure
- ◆ Adjustable board from stencil separation speed
- ◆ Adjustable print table height

### MODEL RANGE

- ◆ UniPRINT – Standard
- ◆ UniPRINT P - Large
- ◆ UniPRINT P 300 - Large with print height up to 300 mm

### GUIDED SQUEEGEE SYSTEM

- ◆ Perfect print by guided squeegee
- ◆ Rubber or metal blades available for screen or stencil applications
- ◆ Fine individual pressure setup for each squeegee
- ◆ Any UniPRINT can be upgraded by guided squeegee later in the field
- ◆ Easy release for quick stencil change

### TABLE TYPE

- ◆ S – Simple table
- ◆ M – Magnetic table
- ◆ V – Vacuum table
- ◆ T – T-slot table



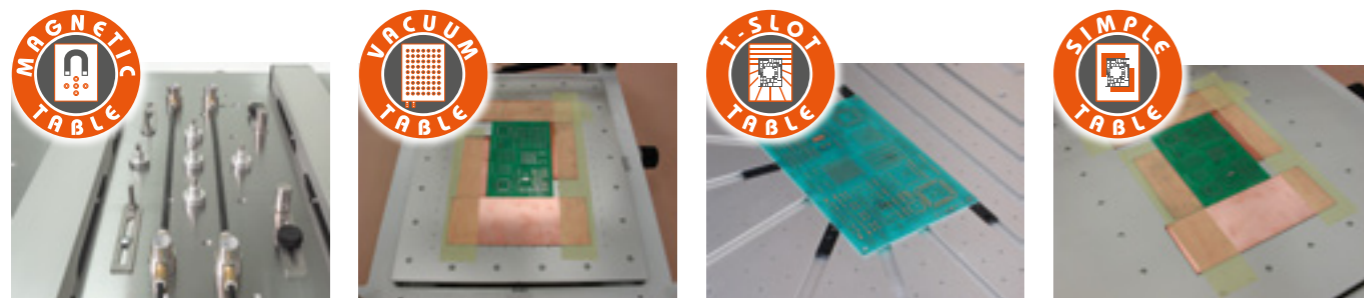
- ◆ guided squeegee
- ◆ gas spring for easy frame opening
- ◆ magnetic table
- ◆ complete set of magnetic PCB fixturing
- ◆ X, Y, Theta playless table adjustment
- ◆ Lift - (smooth pneumatic separation of board from stencil)

### UNIPRINT P 300

- ◆ Printing height up to 300 mm



### FOUR DIFFERENT PRINT TABLE TYPES FOR PCB FIXING



#### M – Magnetic table

- ◆ Flat table made from magnetic metal plate equipped with grid of screws
- ◆ Magnetic edge support rails movable on the magnetic table
- ◆ Magnetic bottom side support pins and vacuum posts
- ◆ For double sided PCBA prints

#### V – Vacuum table

- ◆ Flat table made from magnetic metal plate equipped with grid of screws

#### T – T-slot table

- ◆ Flat table equipped with grid of vacuum holes and slots with pins

#### S – Simple table

- ◆ Simple flat table for basic single side prints

### VARIOUS CLAMPING FOR STENCIL FRAMES

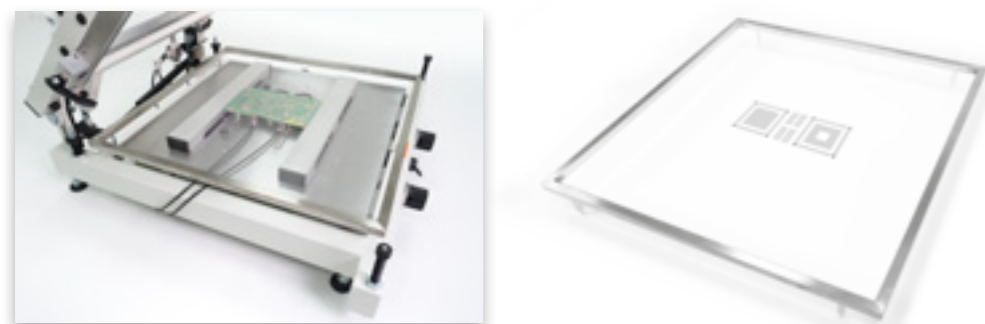


fast slide-in with fixed width  
(frame height 25, 30, 33 mm)

Adjustable screw bars

Slide-in adapters for screw bars

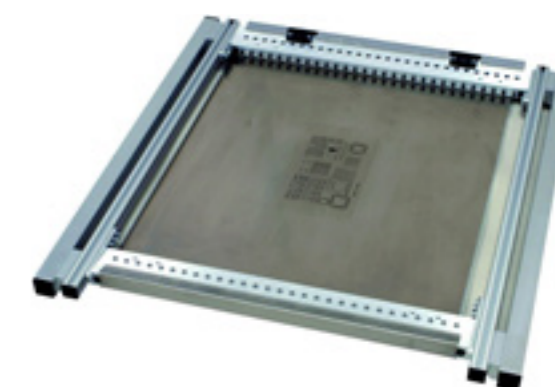
### REGISTRATION FRAMES



- ◆ Registration frame increases the accuracy for print alignment
- ◆ Tested printing to check alignment

### PBT SPRING TENSIONING FRAME

- ◆ Suitable for all PBT Works 23" printers
- ◆ Possible fit into competitor printers
- ◆ Each pin is balanced by individual spring
- ◆ Stability and low weight of frame
- ◆ Easy readjustment



### PBT SCREW TENSIONING FRAME

- ◆ Available in two sizes – standard for UniPRINT or large for UniPRINT P
- ◆ Stiff and rigid bolt beams assure independent left to right tension balance
- ◆ Low-cost solution for stencil tension



### LPKF ZELFLEX TENSIONING FRAME

- ◆ PBT Works printers support unique LPKF Zelflex stretching frames
- ◆ Zelflex Z4P is a unique patented pneumatic four-sided stretching frame
- ◆ Quick and uniform stencil tension



### STENCIL FRAME DATA

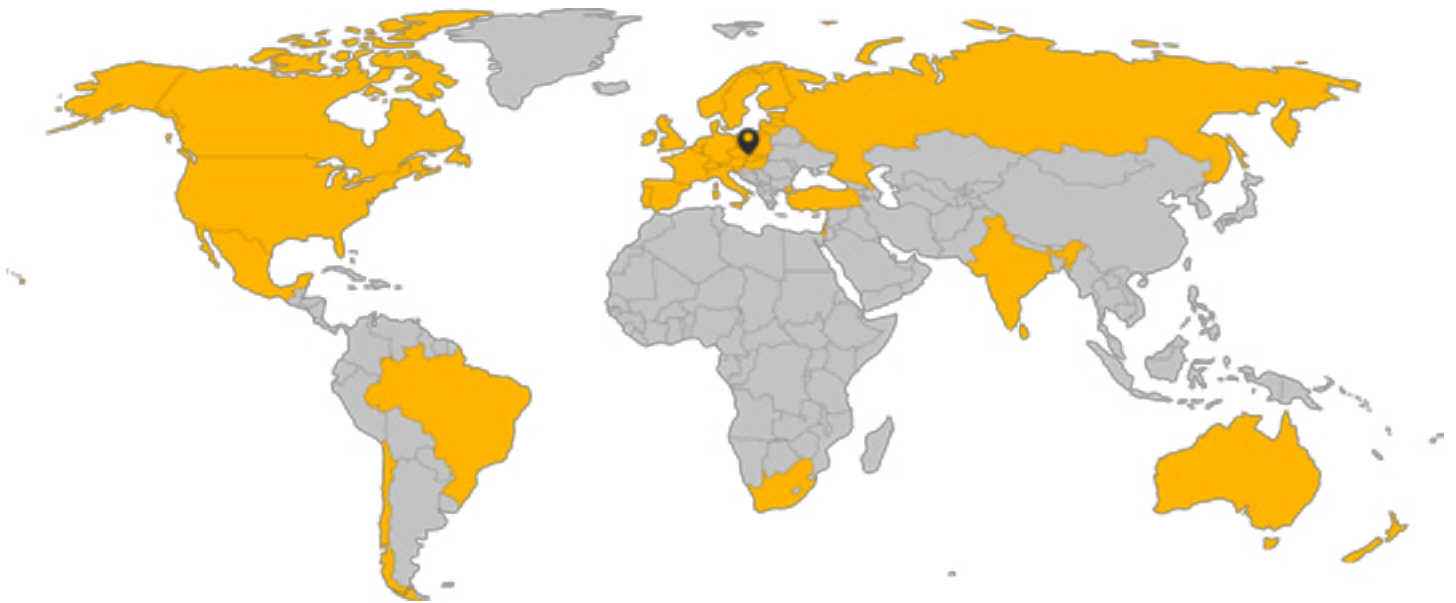
(Orientation: W-left/right, L-front/rear)	Tensioning spring loaded stencil frame 20"/23"			Tensioning screw stencil frame	
Available for Printers	FA23	Go23	UNIPRINT P (larger)	UNIPRINT (smaller)	UNIPRINT P (larger)
Max. print area (WxL) mm	380 x 330	360 x 350	380 x 350	280 x 260	280 x 350
Max. stencil format (WxL) mm	434 x 564			320 x 480	320 x 580
Min. stencil format (WxL) mm	150 x 250			150 x 250	150 x 475
Max. tensioning force	2500 N				
Weight	4 kg			2 kg	2.6 kg
Max outer dimension (WxLxH) mm	584 x 605 x 25			350 x 490 x 37	350 x 585 x 37







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**Think global, act local.**

That is why we work with distributors and representatives. We support and provide our colleagues in many countries worldwide not only with technical information about machine details, but also with highly-valued knowledge of the whole printing process.

We supply spare parts and consumables globally as well as provide service and consulting.

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