RH SOLUTIONS LLC
Bringing Print to Life

ATMAOE MF88
Semi-automatic Flat-Bed Screen Printing Machine

ATMA®

- Manual material loading
- CCD-camera registration and auto-alignment
- Micro-precision printing
- Manual material off-loading

Engineered for high precision screen printing of capacitive touch-screen panels, ITO conductive glass, and other applications requiring exceptional close-tolerance accuracy and consistency.

Meets and exceeds the highest demands with 4-post structure, CCD-camera system, and movable print table to produce high-quality prints on flat materials such as EL-foils, LGP panels, BEF-films, touch screens, membrane switches, flexible printed circuits, and much more.

SLIVER NATIONAL AWARD OF EXCELLENCE WINNER

NATIONAL INNOVATION RESEARCH AWARD

SYMBOL OF EXCELLENCE WINNER

NATIONAL AWARD OF SME (Small and Medium Enterprises)

CE CERTIFIED

ISO 9001 ISO14001 CERTIFIED

NATIONAL LITTLE GIANT AWARD WINNER

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Technical Specifications:

Specifications	ATMAOE MF88 Metric	ATMAOE MF88 Unit Conversions
Max printing area	800mm x 800mm	31.5" x 31.5"
Min printing area	300mm x 400mm	11.8" x 15.7"
Substrate thickness	0.3mm to 6.0mm	0.012" to 0.236"
Machine dimension (W x D x H)	3060mm x 1854mm x 1910mm	120.5" x 73" x 75.2"
Net weight	2,200 kg	4,850 lb
Workflow direction	Left-in Right-out	Left-in Right-out
Cycle Speed (non-stop, full stroke, full speed)	320 P/H	320 P/H
Air pressure	5 to 7kg/cm2	71 to 100 psi
Air exhausted	25 L/cycle	0.88 cubic feet per cycle
Power source	3phase,220/380V,50/60Hz	3phase,220/380V,50/60Hz
Power consumption	4.6 kw	4.6kw
Max frame O/D size	1300mm x 1300mm	51.18" x 51.18"
Min frame O/D size	1000mm x 1000mm	39.37" x 39.37"
Screen micro adjustment X	±10mm	± 0.393"
Screen micro adjustment Y	±10mm	± 0.393"
Screen micro adjustment Z	±2mm	± 0.0787"
Peel-off height	0 to 30mm	0 to 1.18"
Sliding table direction	Right to left movement	Right to left movement
Sliding table precise positioning	0.005mm	0.000197"
Time of table sliding	1.4 sec	1.4 sec
Speed of sliding table	1295mm/sec	51"/sec
Registering platform movement scope	5/5/1.16°	5/5/1.16°
XY registering accuracy	0.005mm	0.000197"
Registering table size	800mm x 800mm	31.5" x 31.5"
X-axis accuracy	0.002mm	7.87×10^-5 inches
Y-axis accuracy	0.002mm	7.87×10^-5 inches
Z-axis accuracy	0.002mm	7.87×10^-5 inches
Printing direction	From back to front side	From back to front side
Max printing stroke	0 to 950mm	0 to 37.4"
Effective printing stroke	0 to 860mm	0 to 33.86"
Printing speed	20mm to 625mm/sec	0.79" to 24.6"/sec
Delay print	0 to 200mm	0 to 7.87"
Delay peel-off	0 to 400mm	0 to 15.7"
Squeegee skew angle	20±15°	20±15°
Flood coater skew angle	45±10°	45±10°
Print head skew angle	±5°	±5°
Adjustable pressing depth	0 to 12mm	0 to 0.472"
Squeegee pressure	3kg to 62kg	6.61 lb to 136.68 lb
Flood coater pressure	3kg to 62kg	6.61 lb to 136.68 lb
Screen stand-by level	30mm	1.18"
Screen cleaning level	350mm	13.78"
Screen lower margin precision	±0.01 mm	± 0.00039"
CCD shooting image area	X=±132.5 to ±405mm / Y=±405mm	X= ± 5.2" to ± 15.9" / Y= ± 15.9"
Visual registering precision	0.005mm	0.000197"
Integration accuracy	0.015mm	0.00059"
Camera distance	216mm	8.622"
CCD FOV (HxV)	10mm x 7.5mm	0.39" x 0.295"
CCD resolution	15.625µm	0.000615"

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FEATURES and BENEFITS:

Advanced design: G7 optimizations of this four-post screen printer include CCD camera visual registering system to achieve precise registration and increased structural rigidity to maintain consistent and accurate close tolerance performance throughout the print run.

Framework:

High rigidity solid chassis: New high rigidity frame features welded high-strength extruded steel structure for highest torsional strength and keeps machine vibration free at all speeds and suitable for CCD Surveillance System.

High accuracy: All components are machined to precise specifications for close tolerance applications.

Rust-proof: All metal surfaces optimized with anti-rust treatments, powder coated, or anodized.

Lift Structure:

German SEW-Eurodrive motor powers four-post head lift on linear bearings and guide rails. Includes synchronized transmission shaft, double chain, encoders and photo sensors to control screen up / down position.

Digitally controlled height position settings for printing, stand-by, and cleaning levels maintain accuracy to within ±0.05mm (±0.002”) cycle after cycle.

Four-post Pneumatic Frame Locking: Pneumatic frame locking system with check valves / airlock and four-sided frame holding assembly ensures rigidity and high stability while printing.

Off-contact height digitally controlled: Screen off-contact height can be set from 0 to 30mm (0 to 1.18”) via touch-screen panel.

Sliding Table:

Accuracy: CCD camera system guides fine registration adjustment via three sets of servo motors controlled by precision scaled micrometers for repeatability and standardization.

Sliding table reciprocates in rightward/leftward motion, using a linear rail system with hydraulic buffers and magnetic suction to achieve repeatable position accuracy within 5µm (0.0002”).

Table surface is precisely made of thick aluminum alloyed plate, treated with hardness ionization to prevent scratching the substrate, with table flatness accuracy within ±0.05mm (±0.002”).

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FEATURES and BENEFITS continued:

Vacuum Adjustment: The strong vacuum system holds the substrate firmly on the print table with suction power that can be adjusted digitally for specific substrate characteristics and requirements.

Printing:

Servo Motor Direct Drive provides malfunction-free operation with digital control, solid printing torque, and extremely stable motion for smooth, precise, vibration-free printing and absolutely even and uniform ink deposit.

Digital pressure equalization system allows parameter settings to be saved and recalled from touch-screen. Print and flood coater pressure is digitally set and automatically equalized for precise balance and consistency of printed ink film layer.

Delay Printing and Variable Squeegee Pressure Through Stroke Phases: Touch-screen digital settings can be set for light squeegee pressure at the beginning of the print stroke and then once past the edge of substrate regular full pressure can be applied according to the input setting. This feature prevents squeegee rubber from ripping screen against direct contact of sharp edge or corner of rigid substrate. Allows longer life of mesh and squeegee rubber.

Dust-proof Inner Guide Rail Assembly: Linear guide rails for printing stroke are protected by a rigid aluminum extrusion profile to prevent intrusion of dust or other contamination.

Rail-led Cylinder Movement in Print Head: Rail-led cylinders guide squeegee and flood coater up and down, allowing smooth movement and unrestricted accurate pressure application to improve print quality, consistency, and uniformity.

Screen Frame:

Patented Leveling Adjustment: Four corner screen leveling of frame holder allows fine adjustment to compensate for mesh tension or uneven frames, and to always position mesh parallel with the table surface.

Screen Frame Micro-adjustment: Screen frame X/Y/Z three point micro adjustment is enabled by the smooth double frame structure with precise position indicators showing adjustments from original position.

Digitally controlled servo peel-off distance start/end point can be set relative to image size, with variable speed and height control. Peel-off and print stroke is synchronized with all conveniently adjustable preset functions. Parameter settings, including off-contact, can be saved and recalled from touch-screen.

Pneumatic frame locking system with check valves designed to lock air lines to maintain firm locking of the screen frame over night and if needed for long hours over the weekend.

FEATURES and BENEFITS continued:

Control System:

Digital Control: HMI color touch panel with 7” screen streamlines setup and provides consistent control over print quality for repeat jobs by saving and restoring up to 100 job recipe groups to easily identify job number and name of stored functions and parameter settings.

Module Expansion: The advanced controller is highly compatible with industry standard systems for convenient module expansion and uncomplicated maintenance.

Error Display: Upon any interruption of operation, error messages are displayed on the touch-screen for quick trouble shooting.

Top quality components include:

The ATMAOE MF88 includes seven sets of servo motors: Sliding table right / left motion (1 set), peel-off up down (1 set), printing head forth and backward (1 set), X/Y/Z axis displacement for CCD registering (3 sets), printing head up down (1 set).

One digital equalizer for squeegee/flood coater pressure.

Advanced PLC: In addition to control systems already mentioned, has available several reserved sets of input/output connections for integration and synchronization with other equipment in the production line.

Safety Features:

Automatic Pressure Detection Switch: Stops operation automatically when air pressure source insufficiency is detected.

Optional Full Cover Dust Proof Shield: Prevents dust or particle intrusion, raising the yield rate, improving appearance, and providing additional operator safety protection.

Safety Beams: When screen descends, any foreign object detected in the printing section area will cause the screen to raise automatically in order to protect both operator and equipment.

Three Color Warning Lamp: Clearly shows machine operating status at all times.

Emergency Stop Buttons: To ensure safety, the ATMAOE MF88 is equiped with 4 emergency stop buttons, activation of which will immediately halt all machine movement and cut off internal power, requiring a restart before continuing operation.

Safety Loop: Upon any operating error or malfunction, the machine will stop immediately and display an error message on the touch-screen indicating how to quickly restore safe operation.

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FEATURES and BENEFITS continued:

CCD Camera Registration System Features:

(1) Integrated illumination by white light high luminance LED.

(2) Field of view: FOV 12 X 9, depth 0 to 6mm (0 to 0.236”).

(3) Unrestricted target shape, enables tracing of irregular targets.

(4) Optionally can add up to 4 total CCD cameras to increase registering accuracy even further.

(5) Operator is still able to choose edge registration instead of CCD registering.

(6) Registration can be done within 1 second for regular target.

(7) Professional class monitor display is protected by tempered glass and is acid proof, temperature proof, and anti-interference, with a long operating life time.

(8) Registration via the CCD camera can be recorded and saved/retrieved either locally or remotely through an internet connection for efficient production management.

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