FLEXIBLE SOLUTIONS FOR Electronics Assembly Automation

APS-1 Hybrid

Hybrid Module Assembly System

The APS-1H combines a solid foundation and advanced technology to handle complex hybrid assembly at high throughput rates.

Foundation

The APS-1H features a rigid frame with a servo-driven, linear motor positioning system. A closed-loop feedback system with linear scale encoders continually monitors the exact location of the dual-spindle placement head and ensures outstanding repeatability. This solid foundation enables the APS-1H to attain ±0.0005" (0.012mm), 3 sigma placement repeatability.

Capability

The APS-1H meets hybrid module production challenges with highly repeatable performance and configuration flexibility. To complement its accuracy, the APS-1H supports a variety of die presentation formats, including wafer, GEL-PAK, Surftape and waffle packs. The APS-1H features a large, flexible tabletop that accepts up to 108 two-inch waffle packs, or a custom configuration tailored to meet your unique application requirements.

Advanced Alignment

The APS-1H provides multiple methods for component alignment and upward vision. Components are optically aligned during travel from pickup to placement, maximizing throughput and utilization. The upward vision system provides a second means to align devices such as flip chips, BGAs, and QFPs. Our unique alignment system, combined with upward vision, provides optimal imaging for the full range of die and SMT components.

Features and Benefits

- Assembles advanced packages, hybrid circuits and microelectronic modules
- Provides ±0.0005" (0.012mm), 3 sigma placement repeatability
- Processes die as small as 0.008" (0.2mm)
- Reconfigures easily to meet changing production needs
- Handles substrates from 1.0 to 19.3" (25 to 490mm) wide

www.goppm.com - email: ppm@goppm.com Phone: 603-895-5112; Fax: 603-895-5113
Precision Placement Machines Inc., 326 Main Street - Unit 11;

APS-1H - General Specifications

Placement Repeatability Performance	
Up to 2,000 cph	0.0005" (0.012mm) @ 3 sigma
Up to 5,000 cph	0.0040" (0.101mm) @ 3 sigma
Vu10 (standard) Upward Vision Component Processing	
Size	0.02" - 2.20" (0.508mm - 55.880mm
Minimum Pitch	0.006" (0.152mm)
Minimum Interconnect Size	
Bump, ball, pad	0.005" (0.127mm)
Lead	0.003" (0.076mm)
Minimum Interconnect Spacing	0.002" (0.051mm)
Bump, ball, pad inspection	Pitch, missing, lead-to-pad fit, diameter check
In-Process Component Processing	
Size	0.008" - 1.0" (0.203mm - 25.4mm)
Minimum Pitch	0.0197" (0.500mm)
Minimum Stand-Off	0.0100" (0.254mm)
Minimum Interconnect Spacing	0.0120" (0.305mm)
Minimum Component Thickness	0.0100" (0.254mm)
Lead Alignment	Standard
Feeder Capacity*	
8mm Feeders	120
Number of Placement Spindles	2
Number of Heads	1
Placement Repeatability	
Chips	0.0033" (85µm) @ 3 Sigma
Fine Pitch	0.0024" (60µm) @ 3 Sigma
Placement Force	85 - 850 grams (190 - 310 grams, standard)
16" Feeder Base Capacity*	6
Machine Dimensions	
Length	79" (2006mm)
Depth	50" (1270mm)
Height (without/light tower)	54" (1370mm)
Height (with light tower)	71" (1803mm)
Floor Space Requirements	
Length (w/PC console)	102" (2591mm)
Depth (w/7" reels and PC console)	90" (2286mm)
Power Requirements	
Input Line Voltage	200 - 240 VAC
Input Line Frequency	50/60 Hz
Power	3.5 KVA peak
Compressed Air Requirements	
Pressure	80 psi (5.5 bar)
Flow	7 SCFM maximum
Operational Temperature Range	50° - 95°F (13° - 32°C)
Relative Humidity	30% - 90% noncondensing
Shipping Dimensions (L x W x H)	96" x 52" x 82" (2438 x 1321 x 2083mm)
Shipping Weight	4200 lbs (1890 kg)
Accessories Box	
Dimensions	42" x 42" x 42" (107cm x 107cm x 107cm)
Weight	300 lbs (135 kg)

** Consult applications department for other configurations*

Positioning System

X-Y Drive System	Brushless DC-servo direct drive linear motors
X-Y Encoder Type	Linear encoder
X-Y Axis Resolution	0.00005" (0.00127mm)
Z Drive System	Brushless DC-servo motor, rack & pinion
Z Encoder Type	Glass, rotary
Z Axis Resolution	0.0002" (0.005mm)
Theta Drive System	Brushless DC-servo motor, direct drive
Theta Encoder Type	Glass, rotary
Theta Axis Resolution	0.0035°
Theta Axis Repeatability	±0.01°
Number of Nozzles	6 standard
Nozzle Changers	2 standard

Board Handling

Substrate Size (typical)**	PCB, leadframe, boat, flex (pallet), ceramic
Maximum (width x length)	19.3" x 25.0" (490mm x 635mm)
Minimum (width x length)	0.98" x 3.0" (25 x 76mm) w/o Vu8
Maximum Thickness (including warpage)	0.200" (5.08mm)
Minimum Thickness	0.008" (0.203mm)
Weight	4.4 lbs (2.0 kg)
Conveyor	
Height	37.5" ± 0.5" (952.5mm ± 12.7mm) SMEMA
Board Flow	Left to right, right to left (without input & output magazines)
Registration Type	Fiducial
Edge Clearance	0.125" (3.2mm)
Underside Board Clearance	0.787" (20.0mm)
Topside Board Clearance	0.590" (15.0mm)
Underside Board Support	Magnetic supports, vacuum supports optional
Transport Speed	7 - 13 in/s (177 - 330mm/s), (programmable)

***Consult applications department for specific machine configurations*

Control System

Programming Capabilities	
Machine Operating System	QSOFT-2
User Interface	Windows® 98
Camera Teach Capability	Standard
Array Programming Capabilities	
Multi-Image Panels	Standard
Rotated Board Images	Standard
Off-Line Programming Interface	
CAD / ASCII Data Input	Standard
Gerber Conversion	Optional - GC-Place
Board Scanning	Optional
Digitize	Optional - DigiCad and QScan
Feeder Setup Optimization	Standard - QSOFT-2
Placement Sequence Optimization	Standard - QSOFT-2
Line Balancing	Optional
Integrated PC Controller	Dual Pentium processors with SVGA monitor

Vision System

Vision Engine	ICOS MVS 360, 256 grayscale
Vision Operation	12.1" viewable flat screen monitor
Downward Vision System	Vu7+ (standard), Vu11 (optional)
Fiducial Alignment Types	Panel, image, local
Fiducial Target Types	Any unique, high-contrast image
Fiducial Size	
Vu7+	0.020" - 0.100" (0.508 - 2.540mm)
Vu11	0.025" - 0.005" (0.127 - 0.635mm)
Synthetic Fiducial Capability	Square, circle, rectangle, etc
Bad Image Marks	Contrast method
Lighting Type	LEDs with programmable image
Light Level Adjust	Automatic
Field of View (FOV)	
Vu7+	0.287" x 0.386" (7.18 x 9.65mm)
Vu11	0.086" x 0.110" (2.18 x 2.80mm)
Upward Vision System	Vu10 (standard), Vu12 (optional)
Field of View	
Vu10	0.390" x 0.500" (9.9mm x 12.7mm)
Vu12	1.8" x 1.4" (46.0mm x 35.0 mm)
Optics Type	Telecentric
Illumination	LEDs with programmable intensity

Optional Equipment

Wafer Presentation	Reject Belt Handling
Wafer Cassette Handler Option	Input & Output Magazines[†]
Die Flipper Option	Vu11 High Mag Downward Imaging system
Small Die Option	Vu12 Upward Imaging System
Wafer Mapping Option[†]	Detachable Feeder Base and Cart
Flux Pot	Automatic Matrix Tray Handler
Waffle Pack Presentation	Stationary Matrix Tray Holder
GEL-PAK Handling	Tube Feeder Handling
8mm to 56mm Tape Feeders	Programmable Bond Force[†]

[†]Consult factory for availability

PPM
Precision Placement Machines, Inc.
www.goppm.com - email: ppm@goppm.com
Precision Placement Machines Inc., 326 Main Street - Unit 11; Phone: 603-895-5122; Fax: 603-895-5113