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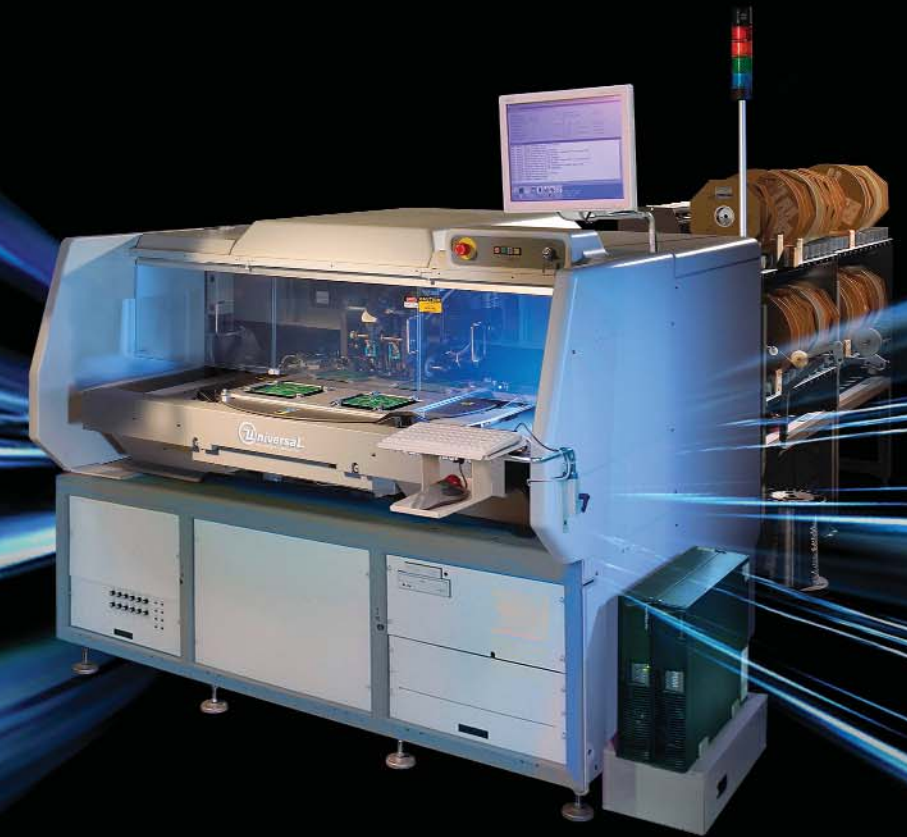
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MC-5792 04/10



GENERATION 88



the enduring standard
for through-hole automation

Generation 88

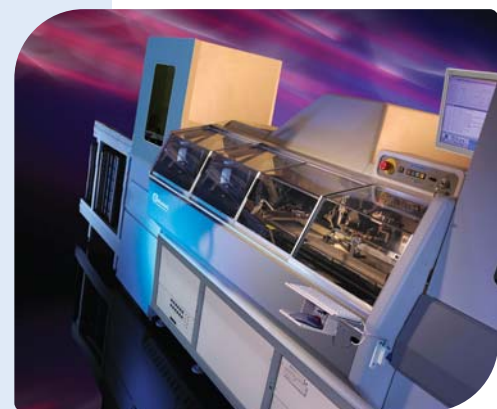
the enduring standard for

Through-Hole Automation

Through-hole technology remains vital and viable in electronic manufacturing, in mature products as well as products in emerging markets. The challenge is how to manage your older, slower, through-hole equipment with these increasing demands. Refined through decades of experience, Universal's through-hole lineup has been evolving to stay one step ahead by leveraging improvements and enhancements to conquer growing demands of the industry.

The answer is Universal Instruments Generation 88 through-hole equipment portfolio. Generation 88 is designed for higher speeds, better throughput, improved reliability, and increased capability to handle your increasing production demands. Universal's Generation 88 equipment provides the industry's highest level of performance, throughput, quality, and support of any supplier in the world.

“A 40-year history as the leading through-hole provider, coupled with outstanding customer support, made Universal the obvious choice for our production requirements.”



The green machine

Generation 88 through-hole machines are the most economical and environmentally friendly gear available today, featuring the industry's lowest electrical and air consumption.

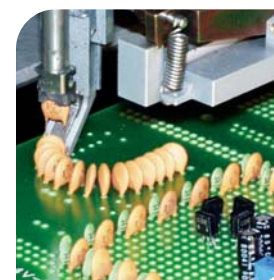
- Uses 50% less electricity than alternative solutions
- Uses 8% less pneumatic than alternative solutions
- Zero scrap on the Jumper Wire 88 inserter

The Jumper Wire 88 is the world's only "zero-scrap" high speed jumper wire inserter, reducing energy costs and eliminating scrap.

Value-driven evolution

Easy to use and easy to maintain with higher throughput and reliability, today's Generation 88 family delivers real speed, stability and cost advantages on your shop floor.

- Fast Auto-repair – 50% faster than Generation 8
- Alternate feeder feature – load several feeders with like components
- Double index feeder – eliminate derate for double-pitch components
- X/Y table speed increase – from 14.5"/second to 17.5"/second
- Dual component sense on the VCD/Sequencer



A heritage of reliability

Robust equipment solutions that run with maximum performance and minimal down-time are critical in getting the most from your manufacturing resources. Generation 88 was designed with rock-solid reliability in mind. New features include:

- RoHS wear-resistant tooling
- New Axial feeder technology eliminates lubrication
- New Radial feeder technology eliminates jamming

Minimizing downtime and lowering your cost of ownership were priorities in the Generation 88 design, ensuring your time is spent building product and adding to your bottom line.



Easy to use

Generation 88 machines are simply the easiest to use, with a full-color graphical user interface that has been simplified to feature just five key functions.

eComStation Operating system provides:

- Improved Networking
- USB port for file and data transfer
- DVD-ROM
- Off-line program generation

From emerging markets where turnover makes operation a challenge, to to state-of-the-art facilities, Generation 88 is equally capable of lessening the learning curve. Simple setup and operation with intuitive controls minimizes operator training.



Flexible performance

Choose from several machine configurations to exactly match your application requirements. From low-cost manual-load with zero board transfer time, to modular automatic board handling options including an optional CE-compliant manual-load machine.

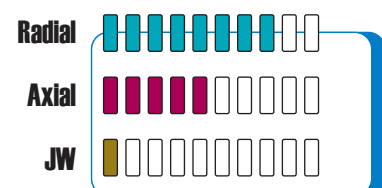
Further optimize productivity and get a faster ROI with expandable component sequencers. With up to 220 stations for axial insertion, or 100 stations for radial insertion platforms. You can load the next job or unload the last while the machine continues working.

The optional component verifier identifies setup errors in advance to guard against improperly loaded components. Each machine can be individually configured for specific requirements.

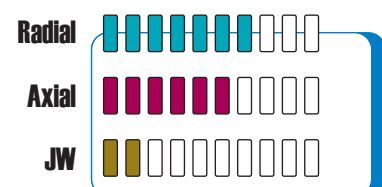


the ideal solution for any market

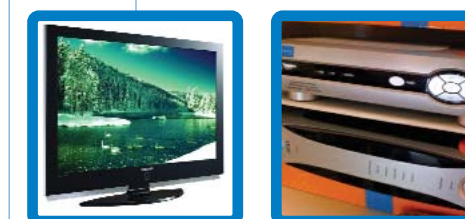
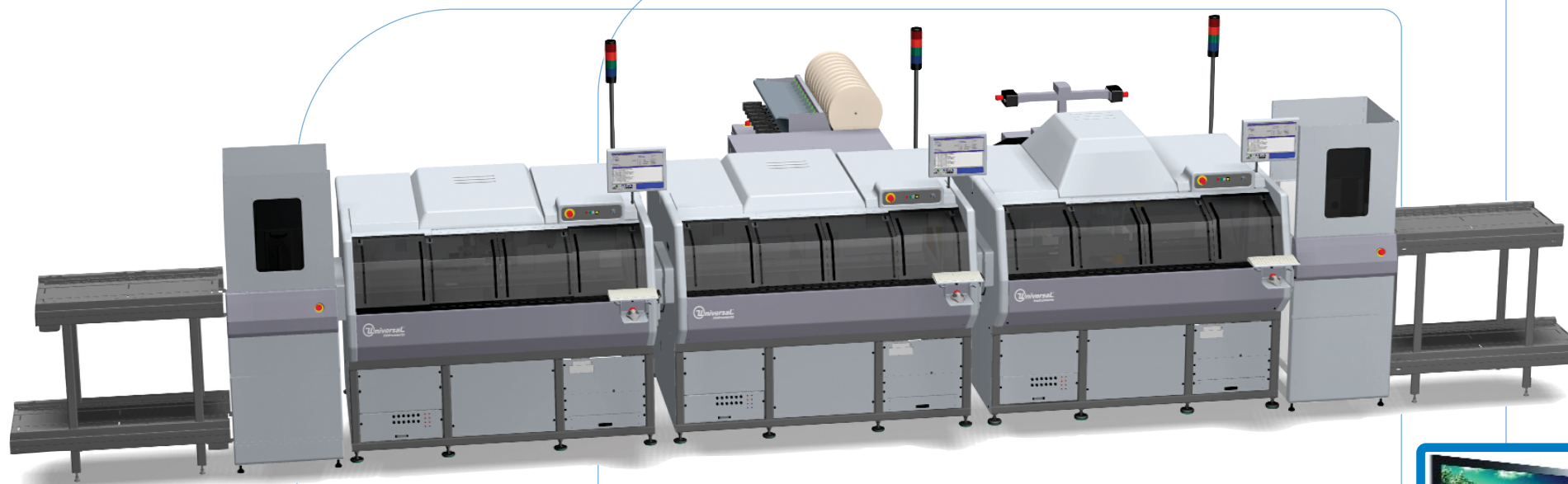
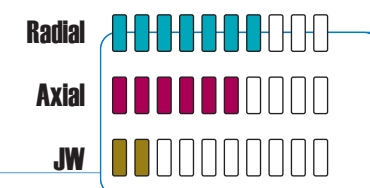
- LED**
- 19k–20k cph actual throughput
 - Dense component placement
 - Large component count (# of insertions)
 - 360-degree radial component placement
 - N-style clinching
 - Dedicated 2.5mm radial insertion head/clinch (high-density tooling)
 - Low number of feeders required – smaller footprint machine configuration
 - Large board and thick board options
 - Component replenishment on-the-fly with alternate feeder
 - Optional manual or automatic board handling configurations



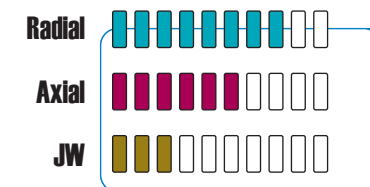
- Power Supply**
- 8k–15k cph actual throughput
 - Small component count (# of insertions)
 - Large component range
 - No derate on large components
 - 360-degree radial component placement
 - N-style and T-style clinching
 - Large triple-span Radial (5.0/7.5/10.0mm)
 - Component replenishment on-the-fly with alternate feeder
 - High-throughput double-index 15mm feeder
 - Optional manual or automatic board handling configurations



- (White Goods) Appliance**
- 18k–20k cph actual throughput
 - Large component count (# of insertions)
 - Large component range
 - No derate on large components
 - Zero-scrap jumper wire option
 - Rapid product changeover
 - High-speed Triple-span Radial (2.5/5.0/7.5mm)
 - Component replenishment on-the-fly with alternate feeder
 - Optional manual or automatic board handling configurations



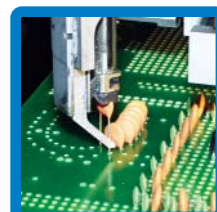
- TV Set-top Box**
- 18k–20k cph actual throughput
 - Dense component placement
 - Dual-span Radial (2.5/5.0mm)
 - Triple-span Radial (2.5mm/5.0mm/7.5mm) or (5.0mm/7.5mm/10.0mm)
 - Zero-scrap jumper wire option
 - Large board or thick board options
 - Component replenishment on-the-fly with alternate feeder
 - Optional manual or automatic board handling configurations



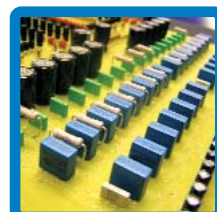
Radial 88

Flexible Radial sequencer / inserter for high productivity

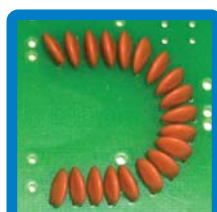
- 22,000 CPH
- Highest "real" throughput Radial inserter
- Highest reliability in the industry (300 ppm)
- Expandable from 20 inputs up to 100 inputs
- Inserts components with lead spans up to 10mm
- Manual Load or Automatic PCB Load/Unload
- Configurable sequencer styles (In-Line or Straight-Back)
- Multiple Clinch options (N, T, 90 Long, 90 Short)
- Expanded Range Verifier
- Simple-to-use operator environment:
 - Operation
 - Diagnostic support
 - Management data
 - Graphical product generation/editor



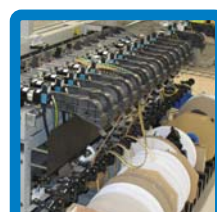
Radial Head Tooling Options
Available 2.5mm (single-span), 2.5/5.0mm (dual-span), or 2.5/5.0/7.5mm (triple-span), 5.0/7.5/10.0mm (triple-span) head tooling can be changed in the field. Generation 88 boasts a smaller tooling footprint for higher-density insertion and RoHS compliance for significantly longer tooling life.



10mm Lead Span Capability
Virtually eliminates tedious manual assembly requirements to improve throughput, product quality, and output per floor space, while reducing associated labor costs and time requirements to provide greater returns.



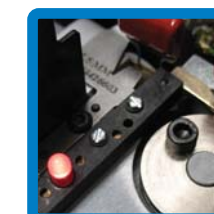
360° Insertion Angle
Insertion heads are servo-driven for precise and rapid component insertion. The insertion tooling may be rotated from 0° to 360° in 1° increments. Mechanical limits prevent the head from rotating between 101° and 159°.



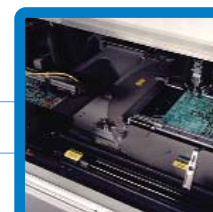
Sequencer Configuration Options
Available in-line or straight-back sequencer configurations to accommodate a variety of factory layouts. Expandable from 20 stations up to 100 stations in 20-station increments.



Component Feeding
Sequencer feeds components to machine from reels or ammo packs. Generation 88 features new jam-resistant designs, alternate feeder capability, and double-index feeders for higher speed and increased throughput.



Re-fire Component Sense
The re-fire circuit in the dispensing head senses a missing component from the input tape and re-fires the dispensing head index mechanism to bring a component into position.



Board Handling Options
Machines are available with either manual-load or automatic PCB handling configurations, including full magazine-to-magazine loader/unloader.



Servo-Driven Axis
The Radial 88 utilizes servo-driven axis to improve speed, accuracy and reliability, while reducing maintenance and setup requirements. The Generation 88 increases table move time from 14.5 inches per second to 17.5 inches per second.

RADIAL 88 SPECIFICATIONS

Cycle Rate	Max	22,000 cph (0.16 sec. per insertion)
Lead Spans	Single Span	2.5mm
	Dual Span	2.5/5.0mm
	Triple Span	2.5/5.0/7.5mm or 5.0/7.5/10.0mm
Reliability	Dual Span	300 ppm or better
	Triple Span	400 ppm or better
		95% Intrinsic Availability
Intrinsic Availability		360° in 1° increments
Insertion Capability		
Component Types	Standard and Odd Form	Capacitors (electrolytic, ceramic, box, and film), transistors, hairpin resistors, diodes, SIPs, LEDs, connectors, tact switches, coils, potentiometers, fuse clips, lamps, fuses, etc.
Component Specs	Maximum Size (LxDxH)	13.0 x 13.0 x 23.0mm (0.512 x 0.512 x .906")
	Tape Pitch	12.7mm (0.5") and 15.0mm (0.6")
	Component Replenishment	Without stopping production
Noise Level Options		78 dba @ 10 feet
	Board Handling	Manual or Automatic PCB load/unload
	Sequencer Size	Up to 100 inputs (in 20 station increments)
	Sequencer Configuration	In-line or Straight-back
	Clinch Types	N or T style
	Component Verification	Expanded Range Verifier (ERV) ensures operator accuracy of component loading
	Networking	eComStation Ethernet, TCP/IP
	Off-line Programming	Virtual PC
PCB Specifications		
	Automated Bd Handling	
	Length x Width (minimum)	102 x 80mm (4 x 3.1")
	Length x Width (maximum)	483 x 406mm (19 x 16")
	Insertable Area	483 x 406mm (19 x 16")
	PCB Transfer Time	2.5 seconds
Manual Bd Handling	Length x Width (minimum)	51 x 51mm (2.0 x 2.0")
	Length x Width (maximum)	559 x 470mm (22 x 18.5")
	Insertable Area	508 x 470mm (20 x 18.5")
	PCB Transfer Time	0 seconds (with 2-window board-holding fixture)



eComStation Windows®-compatible OS

- Simplified Networking
- USB support
- Operation
- Diagnostic support
- Management data
- Graphical product generation/editor



Green Machine
Lower utility costs for electrical and pneumatic, coupled with the zero-scrap feature on the Jumper Wire 88 make Generation 88 the greenest machine on the market.

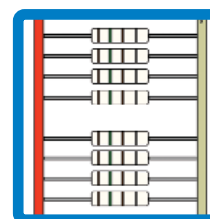
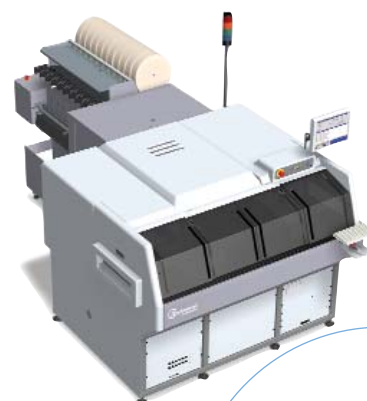


Expanded Range Verifier (ERV)
The ERV allows for the on-line verification of value and polarity of the components to be inserted, reducing the risk of inserting defective, out-of-sequence, or incorrectly oriented components.

VCD/Sequencer 88

High Performance Axial sequencer / inserter for demanding production

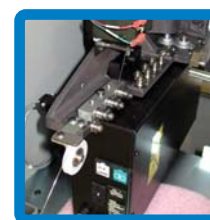
- 26,000 CPH
- Highest "real" throughput Axial sequencer/inserter
- Highest reliability in the industry (200 ppm)
- Expandable from 20 inputs up to 220 inputs
- Manual Load or Automatic PCB Load/Unload
- Expanded Range Verifier
- Expanded Range Verifier
- Simple-to-use operator environment:
 - Operation
 - Diagnostic support
 - Management data
 - Graphical product generation/editor



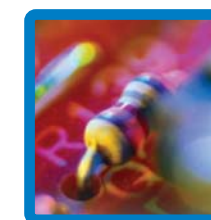
Optical Re-fire Component Sense
The optical re-fire circuit in the dispensing head senses a missing component from the input tape and re-fires the dispensing head index mechanism to bring a component into position.



Servo-Driven Axis
The VCD/Sequencer utilizes servo-driven axis to improve speed, accuracy and reliability, while reducing maintenance and setup requirements.



Jumper Wire Station
The VCD/Sequencer allows for up to four jumper wire stations that utilize a continuous wire input spool. Dispensing jumper wire in this manner reduces the amount of scrap wire, and is lower in cost than pre-packaged jumper wire reels.



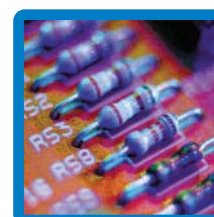
Multi-component Sense
This new feature detects double-drop components, ensuring the best outgoing board quality.

VCD/SEQUENCER 88 SPECIFICATIONS

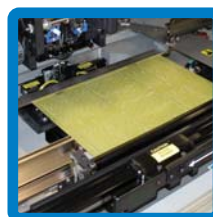
Cycle Rate	Max	26,000 cph (0.14 sec. per insertion)
Reliability		200 ppm or better
Intrinsic Availability		95% Intrinsic Availability
Component Types		Capacitors, resistors, diodes, jumper wire, etc.
Component Specs		
Component Class I	Distance Between Tapes	52.4mm +/- 1.5mm (2.063" +/- 0.059")
	Pitch	5.08mm (0.200") or 10.16mm (0.400")
	Component Replenishment	Without stopping production
Component Class II*	Distance Between Tapes	63.54mm +/- 1.5mm (2.50" +/- 0.059")
		<i>*Quantity of locations for Class II components is limited.</i>
	Pitch	10.16mm (0.400")
		<i>*Pitch not recommended for Class II input</i>
	Component Replenishment	Without stopping production
Standard Tooling	Hole Span	7.62mm (0.300") min – 24.13mm (0.950") max
	Component Body Diameter	Wire lead diameter (min) – 10.69mm (0.420") minus 2 times board thickness (max)
5mm Tooling	Lead Wire Diameter	0.38mm (0.015") min – 0.81mm (0.032") max
	Hole Span	5.00mm (0.197") min – 21.59mm (0.850") max
	Component Body Diameter	Wire lead diameter (min) – 11.68mm (0.460") minus 2 times board thickness (max) (At 5mm span, max component body diameter is 2.29mm (0.090"))
	Lead Wire Diameter	0.38mm (0.015") min – 0.81mm (0.032") max
Noise Level		78 dba @ 10 feet
Options	Board Handling	Manual or Automatic PCB load/unload
	Sequencer Size	Up to 220 inputs (in 20 station increments)
	Insertion Tooling	Standard or 5mm
	Jumper Wire	Bulk Jumper Wire Dispenser System
	Component Verification	Expanded Range Verifier (ERV) ensures operator accuracy of component loading
	Networking	eComStation Ethernet, TCP/IP
	Off-line Programming	Virtual PC
PCB Specifications		
Automated Bd Handling	Length x Width (minimum)	102 x 80mm (4 x 3.1")
	Length x Width (maximum)	483 x 406mm (19 x 16")
	Insertable Area	483 x 406mm (19 x 16")
	PCB Transfer Time	2.5 seconds
Manual Bd Handling	Length x Width (minimum)	51 x 51mm (2.0 x 2.0")
	Length x Width (maximum)	559 x 470mm (22 x 18.5")
	Insertable Area	508 x 470mm (20 x 18.5")
	PCB Transfer Time	0 seconds (with 2-window board-holding fixture)



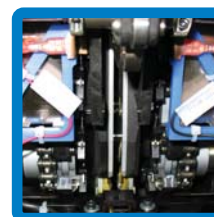
Expandable Sequencer
Expandable from 20 stations up to 220 stations in 20-station increments.



Axial Head Tooling Options
Available 5mm, standard, and large-lead head tooling to accommodate a variety of applications, and can be changed in the field.



Board Handling Options
Machines are available with either manual-load or automatic PCB handling configurations, including full magazine-to-magazine loader/unloader.



Expanded Range Verifier (ERV)
The ERV allows for the on-line verification of value and polarity of the components to be inserted, reducing the risk of inserting defective, out-of-sequence, or incorrectly oriented components.



Component Feeding
Sequencer feeds components to machine from reels, ammo packs or jumper wire spools. New low-friction feeders reduce scheduled maintenance requirements by 50%.

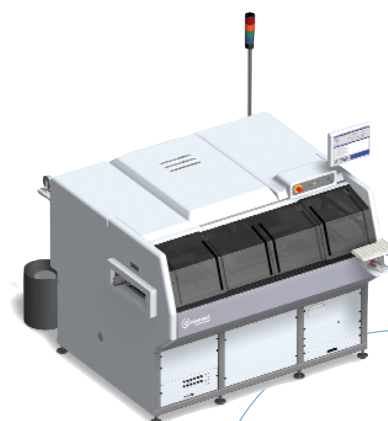


Low-Maintenance Lead Screw on Head and Clinch
The Teflon-coated insertion head and clinch lead screws are virtually maintenance free, requiring very little attention over the machine life cycle.

Single-Head Jumper Wire 88

High-Reliability Jumper Wire inserter with zero waste

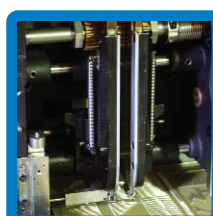
- 33,000 CPH
- Zero Scrap – zero scrap leads
- Highest reliability in the industry (75 ppm)
- Programmable clinch angles from 25° to 75° from vertical
- Manual Load or Automatic PCB Load/Unload
- Simple-to-use operator environment:
 - Operation
 - Diagnostic support
 - Management data
 - Graphical product generation/editor



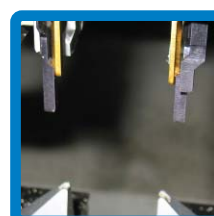
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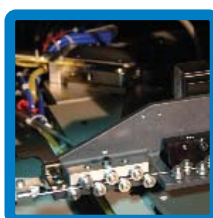
Zero Scrap
The Jumper Wire 88 utilizes a precise, servo-driven wire feed mechanism to feed the exact length of wire required for insertion and clinching in the board without any scrap leads.



High-Performance Insertion Head
The insertion head utilizes servo-driven motors for fast, precise jumper wire insertion.



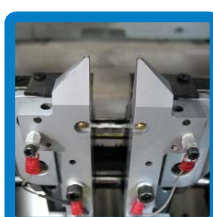
Long Tool Life
Robust tooling endures an extensive life span of approximately 10M - 15M insertion cycles, depending on the material composition of the wire being utilized.



Servo-Driven Wire Feeding
The servo-driven wire feed delivers precise feed lengths into the insertion head to eliminate scrap.



Servo-Driven Axis
The SH JW 8HS utilizes servo-driven axis to improve speed, accuracy and reliability, while reducing maintenance and setup requirements.



Wipe Clinch
The wipe-only, servo-controlled clinch offers programmable clinch angles from 25° to 75° off the board.



Board Handling Options
Machines are available with either manual-load or automatic PCB handling configurations, including full magazine-to-magazine loader/unloader.

JUMPER WIRE 88 SPECIFICATIONS

Cycle Rate	Max	33,000cph (0.109 sec. per insertion)
Reliability	Dual Span	75 ppm or better
	Triple Span	Zero-scrap Jumper Wire leads
		95% Intrinsic Availability
Intrinsic Availability		
Component Specs	Input Wire Diameter	0.51mm (0.020") to 0.81mm (0.032") tin-coated copper wire [0.6mm (0.024") is recommended]
	Input Wire Packaging	Preferred package is a drum that measures up to 405mm (16") high by 350mm (13.8") diameter, which may be placed on the floor next to the machine
Noise Level Options	Hole Span	5.00mm (0.197") min to 33.00mm (1.300") max
	Board Handling	70 dba @ 10 feet
	Networking	Manual or Automatic PCB load/unload
PCB Specifications	Off-line Programming	eComStation Ethernet, TCP/IP
	Automated Bd Handling	Virtual PC
	Length x Width (minimum)	102 x 80mm (4 x 3.1")
	Length x Width (maximum)	483 x 406mm (19 x 16")
	Insertable Area	483 x 406mm (19 x 16")
	PCB Transfer Time	2.5 seconds
	Manual Bd Handling	Length x Width (minimum)
Length x Width (maximum)	559 x 470mm (22 x 18.5")	
Insertable Area	508 x 470mm (20 x 18.5")	
PCB Transfer Time		0 seconds (with 2-window board-holding fixture)