

High-speed Modular
Placement System

FX-3RA

JUKI®



3E EVOLUTION

FX-3RA Features:

- 66,000 CPH (IPC9850)
- Electronic & Mechanical Tape Feeders
- 22" x 32" Maximum Board Size



LOWEST COST OF OWNERSHIP

High-speed Modular Placement System

FX-3RA

Supporting Electronic & Mechanical Tape Feeders and 22" x 32" Maximum Board Size

From the pioneer of the modular assembly line comes the latest technology in high volume production at the lowest cost of ownership. Offering an interchangeable electronic and mechanical feeder solution combined with a new 22" x 32" maximum board size, the continuously evolving FX-3RA offers the utmost in flexibility, reliability, and ease of use for both high speed and high mix manufacturing environments.

- IPC9850 (chip): 66,000CPH*
- Four multi-nozzle laser heads (24 total nozzles)
- Components 01005 (0402 metric) to 33.5mm square
- Feeder inputs: Max. 240 8mm tape feeders when using Electronic Dual Lane

*Actual throughput may vary.

User-friendly Operation

15-inch Touch-panel Color LCD Display

- ◆ Easy teaching using touch screen while looking at the component



- ◆ The graphical user interface is designed for simple operation

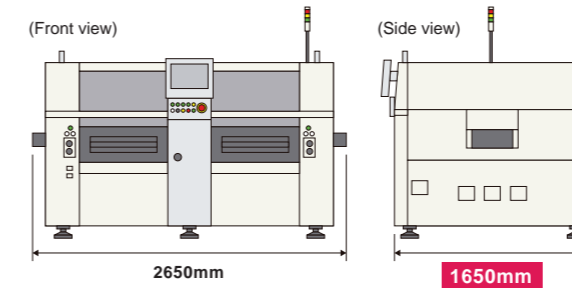


- ◆ The language can be changed at any time



High-speed Placement: Supporting Customer Needs

High Volume with a Minimal Footprint



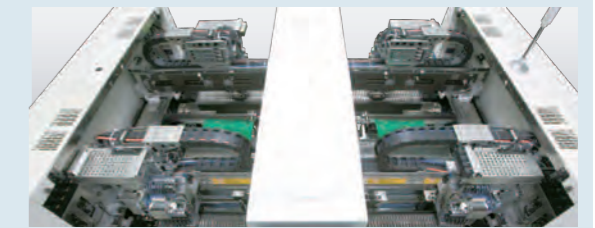
Placement Speed

66,000_{CPH}
(IPC9850)

High-speed Technology

1 Two Stations - 4 Beams - 4 Head Configuration

The FX-3RA can reach placement rates of up to 66,000cph (IPC9850) using four independent beams, each with a 6 nozzle placement head at two placement stations.



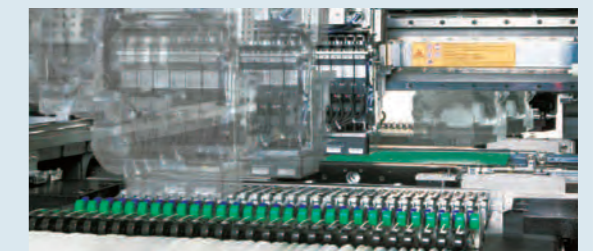
2 X-Y Linear Servomotors

Linear servomotors are used for all of the X-Y axes. Best-in-class performance is achieved by using high-accuracy, incredibly responsive cutting-edge axis control technology.



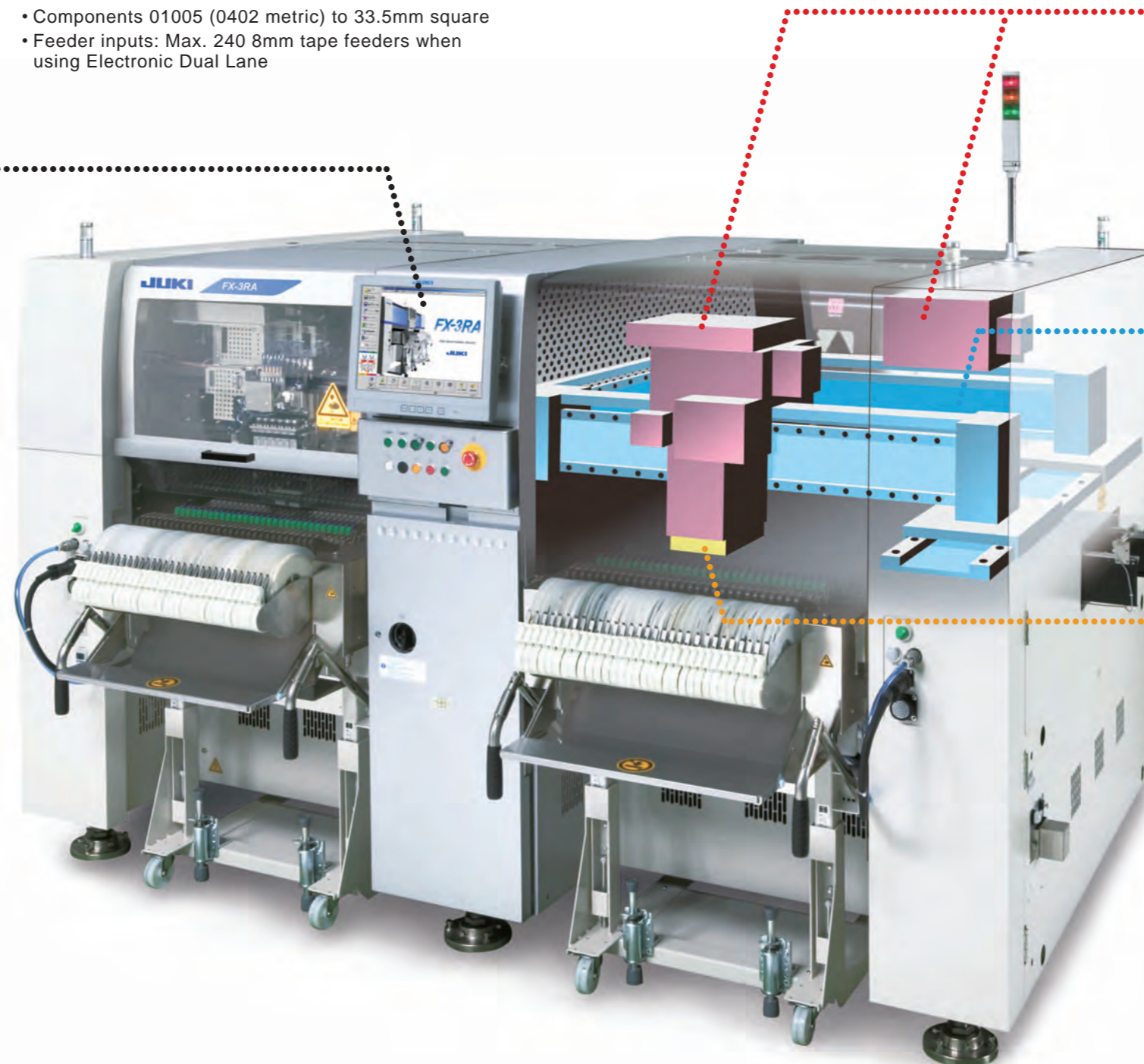
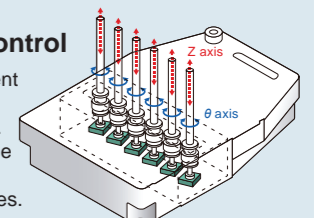
3 On-the-fly Simultaneous Centering using the 6-nozzle Multi-laser Head

Up to six components can be picked and then centered simultaneously using high-resolution on-the-fly laser centering for high-speed placement.



Independent Z / θ control

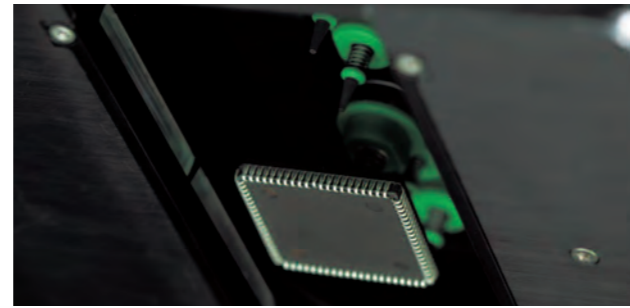
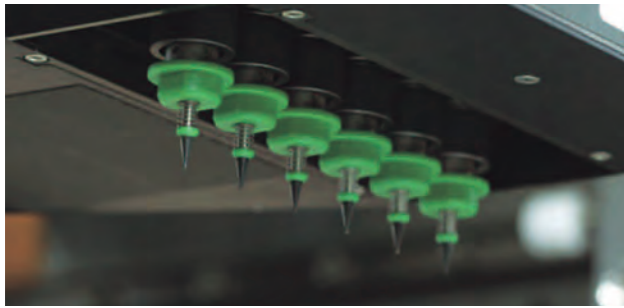
Each nozzle has independent Z and θ motors for high reliability and high accuracy. Precise control of each nozzle is possible without affecting components on other nozzles.



Note: The right station parts shown as an enhanced view.

Laser Centering Technology / JUKI's original technologies for high-speed and high-quality placement.

Laser Sensor: LNC60



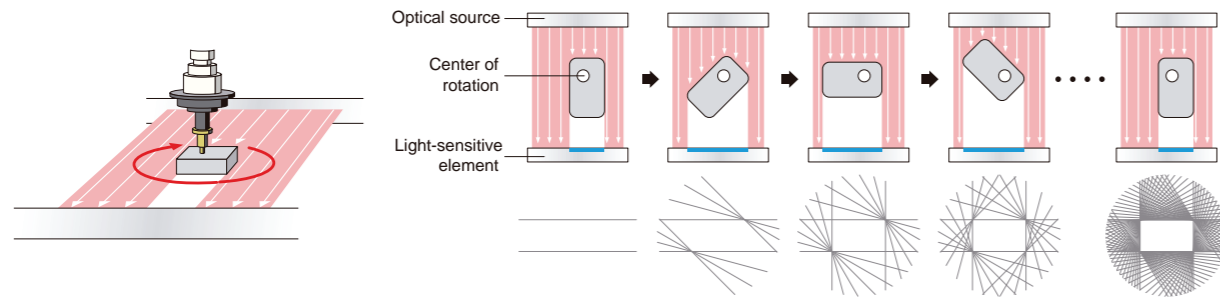
Chip placement speed is greatly improved

Simultaneous picking and on-the-fly parallel recognition with six nozzles are achieved by using the high resolution LNC60 laser sensor.

Unrivaled placement range from 01005 (0402 metric) to 33.5mm square components

The LNC60 brings a new concept in laser centering to the market. This sensor has the unique ability to center components from 01005 (0402 metric) to 33.5mm square parts. From ultra-small, ultra-thin, chip-shaped parts to small QFP, CSP, BGA, a wide range of parts can be mounted by the laser recognition system at high-speed and with high-accuracy.

A New Concept in Component Centering that is Capable of On-the-Fly Centering of 6 Components Simultaneously.

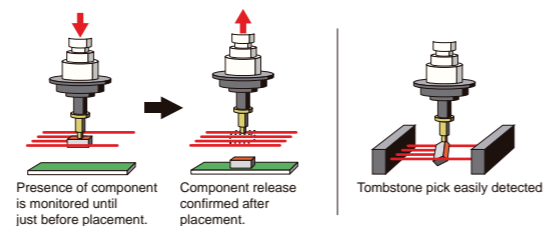


Tangential Line Centering™ achieves both a wider component range and higher accuracy all at the same time. The LNC60 accurately measures the component's center, dimensions, and angular correction all in a single sweep. The optical design has been simplified to give higher reliability in a thinner and lighter package.

Low Loss Ratio

Component Check Function Improves Placement Reliability

Since the laser is mounted on the head, it can be used to monitor the presence of components the entire time from pick to placement. This is difficult to accomplish with vacuum detection only. The placement reliability is also improved because the release of the component is confirmed after placement.



Equipped with Standard Features that Support Diverse Manufacturing Requirements

Fast and Easy Setup, Low Defect Ratio

Auto Teaching of Pick Position



Auto teaching of pick position reduces changeover time and mis-picks.

HMS (Height Measurement System)



The HMS is used to quickly and accurately measure the component pick height. A laser sensor measures the distance instantly without any physical contact.

Flexible

Fiducial Recognition



The OCC lighting system supports a wide variety of board materials including FPC (Flexible Printed Circuit board). Programmable brightness and directional lighting improves fiducial recognition.

Camera Bad Mark Detection

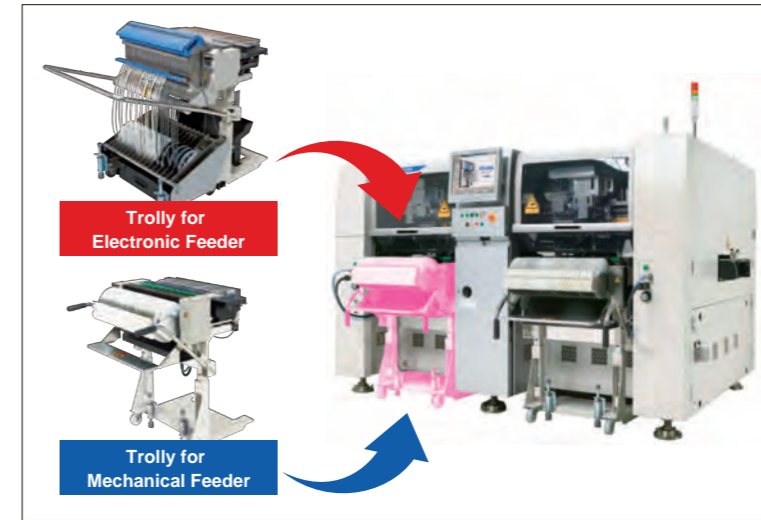


Bad mark detection is performed using the machine's standard downward looking camera (also used for fiducials and teaching), which accurately detects a wide range of marks on various substrates, including flex circuits.

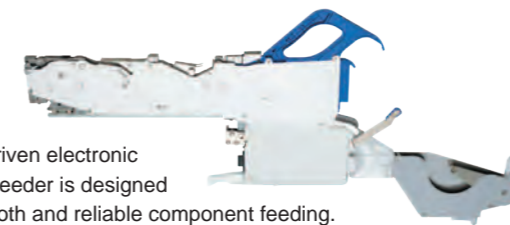
Electronic and Mechanical Tape Feeders can be Switched by the Feeder Trolley

Mechanical and Electronic feeder trolleys are completely interchangeable allowing the customer to make effective use of existing assets. Using only necessary components fed through an electronic tape feeder (fully interchanged) produces superior cost performance.

When feeder trolleys are installed, the placement system automatically recognizes whether electronic tape feeders or mechanical tape feeders are used.



Electronic Tape Feeders - ETF Series / High Precision, High Quality



The motor driven electronic feeder tape feeder is designed for fast, smooth and reliable component feeding.

A new electronic double tape feeder allows up to 240 different components to be loaded, the biggest capacity in the industry. It is ideal for low volume/high mix environments where more files could be clustered into one setup to dramatically reduce change-over time.

Status is displayed with Seven Segment LED

Before production, electronic feeders communicate with the production program to verify the type of feeder and feeder pitch. An LED flashes if there is a discrepancy. The LED display also alerts the operator to running out of components and incorrect feeder position. During machine operation the LED display shows its feeder position.



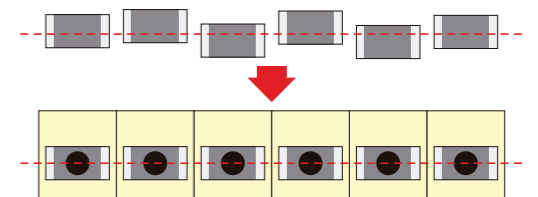
Simple Switching of the Feed Pitch

Simply press a button to change the feed pitch.



Automatic Correction of Pick Position

The variance of the position from the center of each component is detected by the machine head when centering. This information is transmitted to each electronic feeder which automatically adjusts feeding for more stable pick position and for more chance of simultaneous pick.

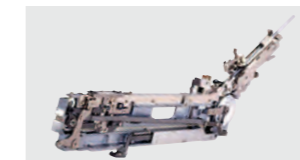


Mechanical Feeders

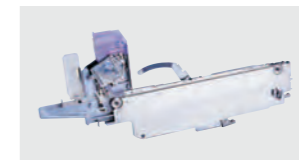
• Tape Feeders



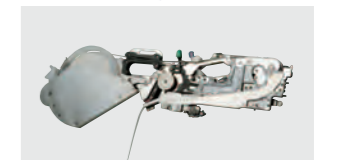
• Stick Feeders



• Bulk Feeders

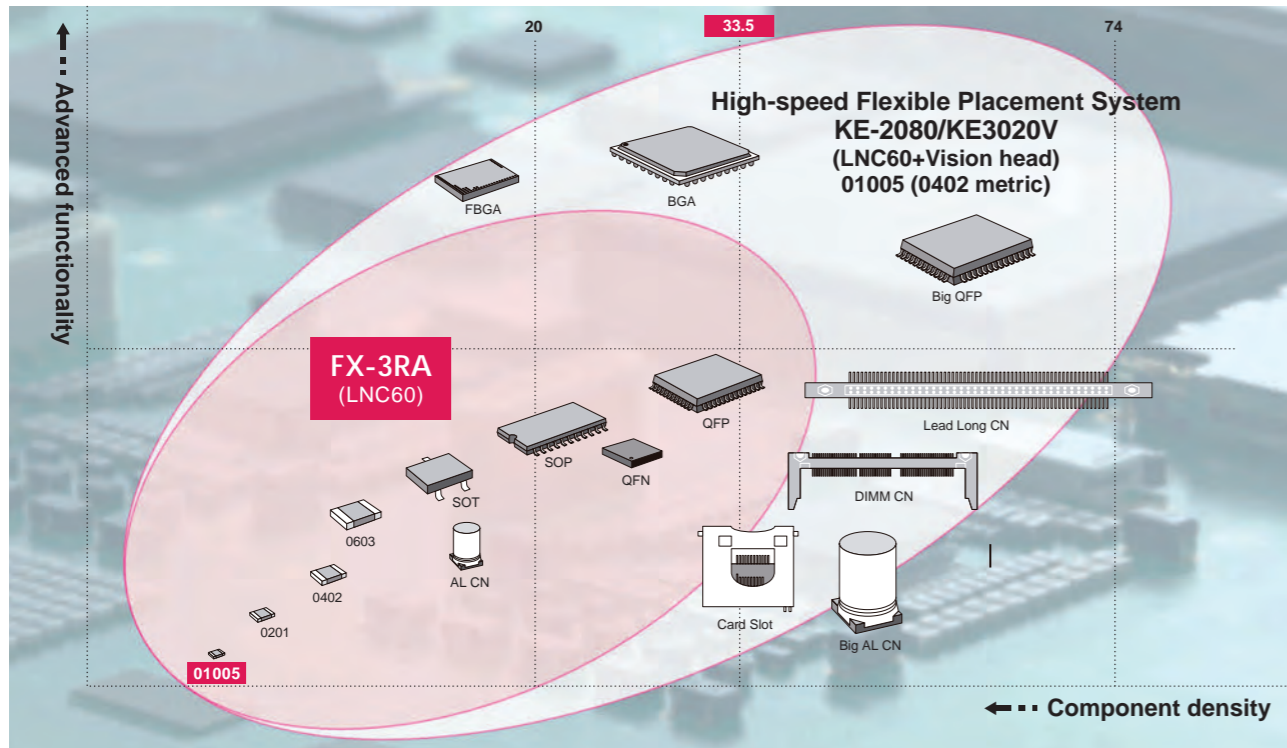


• ATF (Splicing tape feeder)



Wide Range of Components Supported / Results in Flexible Production Lines

FX-3RA can widely recognize and place angular parts ranging from 01005 (0402 metric) to 33.5mm square. By combining it with a High-speed Flexible Placement System KE-2080 or KE3020V, placement parts are effectively sorted supporting highly flexible production capability.



Easy to Operate and Train New Operators

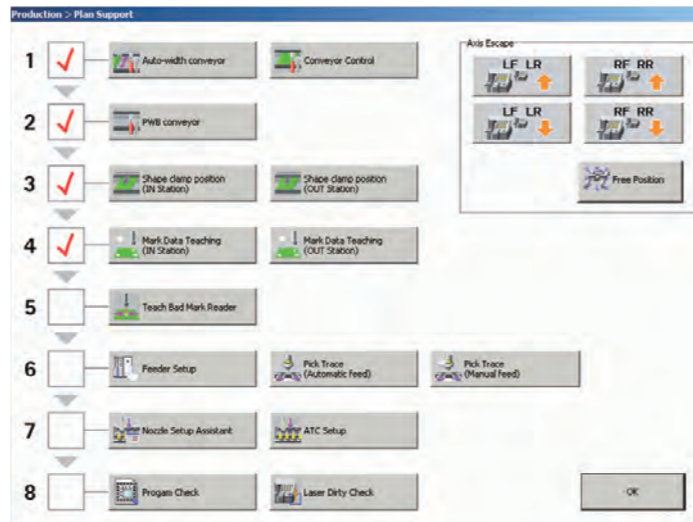
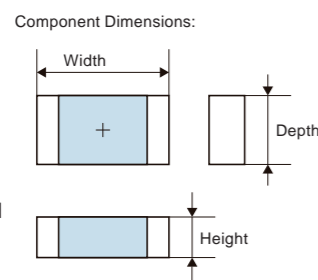
Operator's Setup Checklist

This function assists operators in the preparation of a new production program. By simply following a checklist of setup items listed in the menu, an operator can be sure that the necessary steps for production have been completed.

Simplified Programming

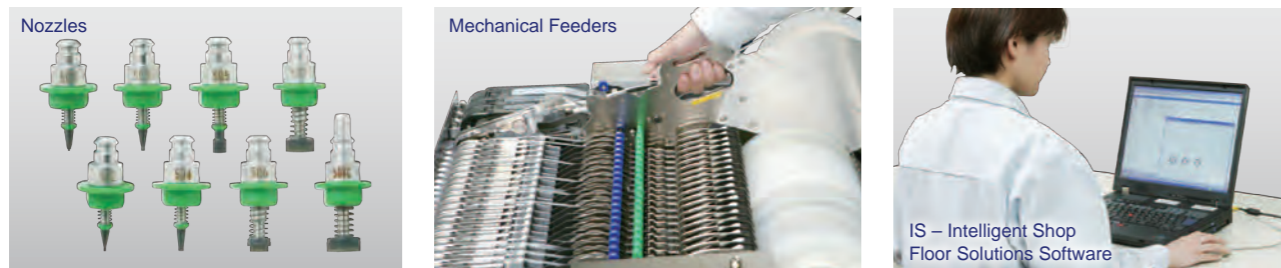
Ease-of-Operation Improved by Automatic Component Measurement

Component data can be programmed just by typing approximate dimensions, type and packaging information. Accurate dimensions, number of leads and lead pitch are measured and programmed by the machine automatically.



Compatibility / Reduced Costs by Maintaining Compatibility

Many parts and accessories are compatible between the FX-3RA and other JUKI placement machines.

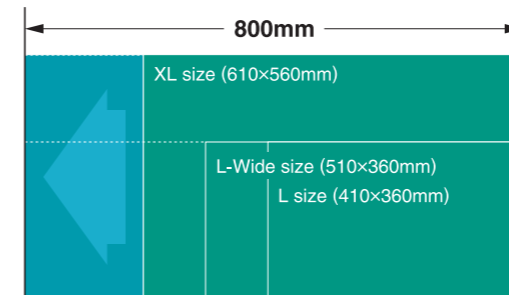


*Please ask for details.

Wide Variety of Options

Options for LED Placement

• Capable of producing long boards (800mm) used in LED lighting



• Nozzles for LED components

JUKI has a variety of nozzles for placing LED components. Contact our sales personnel for details.

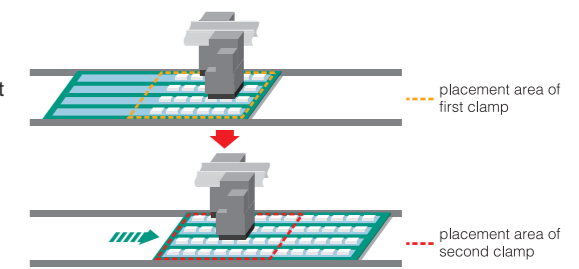


• Solder Recognition Lighting Option

The Solder Recognition Lighting Option can be used to view pasted pads as fiducial marks. This option is most commonly used when building a PCB that requires multiple indexing that does not have valid fiducial marks.

• Component Quantity Control

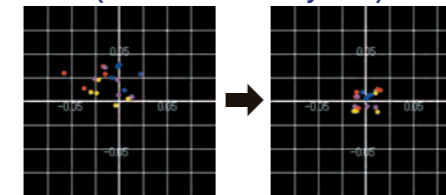
The Component Quantity Control Option calculates the number of LEDs required to build the PCB versus what is remaining on the existing reel and will not allow production to begin if there are not enough components.



Options

High Quality

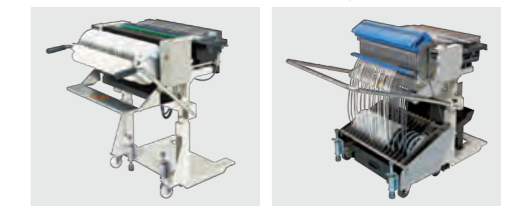
• FCS (Flex Calibration System)



JUKI's superior ease of maintenance just got even easier! The optional FCS calibration jig is a simple to use system to re-calibrate placement accuracy. The machine automatically picks and places jig components, then measures the error and adjusts all necessary calibrations. (optional)

• Feeder Trolley

Industry leading design for easy replacement of an entire bank of feeders in seconds. Single switch release / lock and no feeder retooling required.



Fast Setup and Changeover

• Feeder Position Indicator

LEDs on the feeder bank indicate which feeder needs to be replaced or which feeder has an alarm, indicate location of feeders to be set during changeover, and help simplify feeder setup.



• Component Verification System (CVS)

Measures electrical resistance, capacitance or polarity to verify components have been loaded correctly on the machine.



• Bad Mark Reader

Detects "bad circuit" marks on matrix type boards and skips placement of parts on all defective circuits, preventing waste.

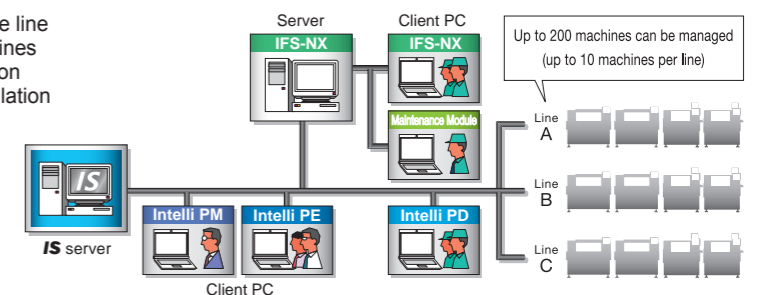
• SOT Direction Check Function

When the 3-terminal SOT is placed on the SOT direction check table, the parts feeding angle is checked by the OCC.

Software

Supported by IS NPI+ and IFS-NX Verification System which includes:

- CAD, Gerber and ASCII or centroid data software package that automatically and efficiently creates complete JUKI program files in seconds
- Employs a client-server architecture that connects the IS server throughout the factory via Ethernet for factory wide control to:
 - Create Production Programs
 - Perform Line and Factory optimization
 - Supports Cluster groups for maximum optimization of the line
 - Supports downloading production programs to multiple lines
 - Supports Line Monitoring and On-Demand Job Production
 - Provides a factory status display and performance calculation
- Utilizes RFID Smart Feeder technology to guarantee accurate production builds:
 - Closed Loop System set to ensure proper feeder setup
 - Improved component Inventory control
 - Provides traceability functionally down to the referenced designator level



Specifications

Item		Model	High-speed modular placement system FX-3RA
Board size	L size (410x360mm) (800mm long optional)		○
	L-Wide size (510x360mm) (800mm long optional)		○
	XL size (610x560mm) (800mm long optional)		○
Component height	6mm		○
Component size	Laser recognition		01005 (0402 metric) to 33.5mm square
Placement speed (chip)	IPC9850		66,000CPH ^{*1}
Placement accuracy	Laser recognition		±0.05mm (Cpk ≥ 1)
Feeder inputs			Max. 240 8mm tape feeders (using dual lane electronic)
Power supply			200 to 415 VAC, 3-phase
Apparent power			Maximum 9.5KVA
Operating air pressure			0.5±0.05Mpa
Air consumption			Max.150L/min
Machine Dimensions (WxDxH ²)	L size		2,650 X 1,650 X 1,530mm
	L-Wide size		2,880 X 1,650 X 1,530mm
	XL size		2,880 X 1,850 X 1,530mm
Mass (approximately)	L, L-Wide size		3,500kg
	XL size		3,750kg

*1: This speed does not apply to XL board size.

*2: Height described is for conveyor height 900mm

Options

Recognition system	Bad Mark Reader / Placement Monitor / Solder Lighting / Component Quantity Control / Offset Placement After Solder Screen-Printing (OPASS)
Operation system	Long Board Option / Trolley Kits
Inspection function	Component Verification System (CVS) / SOT Direction Check Function
Others	FCS Calibration Jig / Feeder Position Indicator / Pin Reference
Software	IS NPI+ / IFS-NX
Component handling and feeders	Mechanical Feeder Trolley / Mechanical Tape Feeder 8~56mm / Mechanical Adhesive Tape Feeder 32mm /
	Mechanical Stick Feeder / Mechanical Bulk Feeder / IC Collection Belt / Trash Box / Tape Reel Base /
	Connector Bracket / Electric Tape Feeder 8~56mm / Electric Feeder Trolley / Electronic Stick Feeder

*Please refer to the product specifications for details.

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JUKI CORPORATION HEAD OFFICE

Juki Corporation operates an environmental management system to promote and conduct the following as the company engages in the research, development, design, sales, distribution, and maintenance services of industrial sewing machines and industrial robots, etc. and the research, development and design of household sewing machines, and in the provision of sales and maintenance services for data entry systems.

- (1) The development of products and engineering processes, which are safe to the environment
- (2) Green procurement and green purchasing
- (3) Energy conservation (reduction in carbon-dioxide emissions)
- (4) Resource saving (reduction of papers purchased, etc.)
- (5) Reduction and recycling of waste
- (6) Improvement of logistics efficiency (modal shift and improvement of packaging, packing, etc.)

<http://www.juki.co.jp>

