## Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>High-speed modular mounter FX-3L / FX-3XL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Board size</strong></td>
<td></td>
</tr>
<tr>
<td>L size</td>
<td>(410x360mm)</td>
</tr>
<tr>
<td>L-Wide size</td>
<td>(510x360mm)</td>
</tr>
<tr>
<td>XL size</td>
<td>(610x560mm)</td>
</tr>
<tr>
<td><strong>Component height</strong></td>
<td>6mm</td>
</tr>
<tr>
<td><strong>Component size</strong></td>
<td>Laser recognition</td>
</tr>
<tr>
<td></td>
<td>0402 (01005)</td>
</tr>
<tr>
<td>Placement speed (chip)</td>
<td>Optimun</td>
</tr>
<tr>
<td></td>
<td>0.049Sec/chip (74,000CPH)</td>
</tr>
<tr>
<td>Placement accuracy</td>
<td>Laser recognition</td>
</tr>
<tr>
<td></td>
<td>±50µm (±0.1)</td>
</tr>
<tr>
<td>Feeder inputs</td>
<td>Max. 120 on 8mm T/F</td>
</tr>
<tr>
<td>Power supply</td>
<td>200 to 415 VAC, 3-phase</td>
</tr>
<tr>
<td>Apparent power</td>
<td>7.8kVA/7.8kVA/9kVA</td>
</tr>
<tr>
<td>Operating air pressure</td>
<td>0.5±0.05Mpa</td>
</tr>
<tr>
<td>Air consumption</td>
<td>Max. 150m³/min</td>
</tr>
<tr>
<td><strong>Machine Dimensions</strong></td>
<td></td>
</tr>
<tr>
<td>(90Cells×1)</td>
<td>L size</td>
</tr>
<tr>
<td></td>
<td>2,850 x 1,650 x 1,530mm</td>
</tr>
<tr>
<td></td>
<td>L-Wide size</td>
</tr>
<tr>
<td></td>
<td>2,880 x 1,650 x 1,530mm</td>
</tr>
<tr>
<td></td>
<td>XL size</td>
</tr>
<tr>
<td></td>
<td>2,880 x 1,650 x 1,530mm</td>
</tr>
<tr>
<td><strong>Mass (approximately)</strong></td>
<td>XL size</td>
</tr>
<tr>
<td></td>
<td>950kg</td>
</tr>
<tr>
<td></td>
<td>L-L Wide size</td>
</tr>
<tr>
<td></td>
<td>3,750kg</td>
</tr>
</tbody>
</table>

### Options

- **Recognition system**: Bad Mark Reader
- **Operation system**: Rear-side Operation Unit / Handheld Operating Device (HOD)
- **Inspection function**: Component Verification System (CVS) / SOT Direction Check Function
- **Others**: FCS Calibration Jig / Feeder Position Indicator / Pin Reference / Longer sized PWB in X axis / Lighting Unit For Solder Recognition / Component Quantity Control
- **Software**: IS / HLC / Board Viewer / EPU / Flexline CAD / SCS
- **Component handling and feeders**: Mechanical Feeder Trolley / Mechanical Tape Feeder 8–56mm / Mechanical Adhesive Tape Feeder 53mm / Mechanical Stick Feeder / Mechanical Bulk Feeder / IC Collection Belt / Trash Box / Tape Feed Base / Connector Bracket / Electric Tape Feeder 8–56mm / Electric Feeder Trolley

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*Please refer to the product specifications for details.*

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High-speed modular mounter

FX-3

The ever-evolving high speed mounter FX-3 meets customers’ needs by the combination of a wide variety of feeders ranging from electric to mechanical tape feeders. This is a new proposal from JUKI, our continuously evolving concept.

- Optimum : 0.049sec./chip (74,000CPH)
- IPC9850 (chip) : 60,000CPH
- Four multi-nozzle laser heads (24 total nozzles)
- Components from 0402 (01005) to 33.5mm square
- Feeder inputs : Max. 120 using 8mm Tape feeders

Actual throughput may vary.

User-friendly Operation

15-inch Touch-panel Color LCD Display

- Easy teaching realized by only touching the pointer you want to move while looking at the OCC image.
- The highly visual touch panel color monitor with excellent operability is provided as standard design.
- The language can be changed by one-touch even while operating or displaying the error screen.

High-speed Technology

1 Two Stations - 4 Beams - 4 Head Configuration

The FX-3 can reach placement rates of up to 60,000ph (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.

High-speed placement : Supporting Customer Needs

High volume with a minimal footprint

Placement speed

| 0.049 sec./chip : 74,000CPH (Optimum) |
| 60,000CPH (IPC9850) |

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

Evolving into ever more attractive products.
Evolving further for sales and services.
Aiming to achieve even more enhanced customer satisfaction.
Together with our customers, we will continue evolving ever further.
Laser centering technology / JUKI’s original technologies realize high-speed and high-quality placement.

Laser sensor: LNC60

Chip placement tact is improved by 20% compared with conventional machines.

Simultaneous picking and on-the-fly batch recognition with 6 nozzles are realized by the laser sensor, LNC60. Also, the placement tact is improved by 20% compared with conventional machines which use 4 nozzles.

Unrivaled placement range from 0402 (01005) 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 0402 (01005) 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.

High functions as standard specifications / Supporting diversified mounting requirements.

Fast and easy setup, Low defect ratio

Auto teaching of pick position

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

HMS (Height Measurement System)

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.

Fiducial recognition

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

Camera bad mark detection

Wide range of supportive parts / Enabling you to build highly operational production lines.

FX-3 can widely recognize and place angular parts ranging from 0402 to 33.5mm. By combining it with the High-Speed Flexible Mounter KE-2080, placement parts are effectively sorted and highly operational production lines can be built.

Advanced functionality

Presence of component is monitored until just before placement.

Component release confirmed after placement.

Tombstone pick easily detected.

Simultaneous picking and on-the-fly batch recognition with 6 nozzles are realized by the laser sensor, LNC60. Also, the placement tact is improved by 20% compared with conventional machines which use 4 nozzles.

A motor driven electric feeder capable of feeding a component steadily and fast.

Simple switch of feed pitch

Just pressing a button can switch feeding 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 electric feeder so that each electric feeder automatically adjusts feeding for more stable pick position and for more chance of simultaneous pick.

Status is displayed with seven segment LED

Before production, electric feeders communicate with the main unit to verify the consistency with the production program: type of feeder and feed pitch. Should there be any discrepancy, LED display flashes on and off. LED display also alerts the operator to running out of components and wrong feeder position. During the machine operation LED display shows its feeder position.

High-speed flexible mounter KE-2080

(LNC60+Vision head)
**Easy operation / Ultimate pursuit of easy operation**

**Function to support operators**

This function assists operators in the preparation for a new production. By simply checking each set up menu from "1. Automatic with adjustment" to "10. Production program check", an operator can see the set up status of operation.

**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 machine automatically.

**Compatibility / Reduced costs by maintaining compatibility**

Many parts and accessories are compatible between the FX-3 and older Juki placement machines.

- Please ask for details.

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**Electric tape feeders and mechanical tape feeders can be switched by the feeder trolley.**

As mechanical and electric feeder trolleys are completely interchangeable, customers can make effective use of existing machinery assets. Using only necessary components fed through an electronic tape feeder (fully interchanged) produces superior cost performance.

When feeder trolleys are set to four feeder banks, the mounter automatically recognizes whether electric tape feeders or mechanical tape feeders are set.

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**Wide variety of options**

**Longer sized PWB in X axis**

Capable of placing a longer board up to 800 mm × 360 mm with FX-3 XL, and up to 800 mm × 160 mm with FX-3L, by automatically indexing the board twice in each station. As a result, the production of long PWB used for the LED lighting etc. is enabled.

- **Solder Recognition Lighting (option)**
  - The solder print can be recognized as BOC mark when there is no BOC mark on the PWB or the circuit. When the twice-fed long PWB is transported, the placement pad etc. on which the solder print is performed at the placement of components in the range where the BOC mark is not prepared can be set as BOC mark.

- **Component Quantity Control (option)**
  - The set of the product (PWB) where the components (LED components etc.) are placed is measured. When the twice-fed long PWB is loaded, it is checked whether components required to complete a production of the PWB remain in the feeder with components in different lots not being mixed in a PWB. If components are not enough, a warning is displayed before the placement starts.

**Feeder**

- **Mechanical feeders**
- **Electric feeders**
  - Tape Feeders
  - Stick Feeders
  - Bulk Feeders
  - ATF (Splicing tape feeder)

**Sophisticated options**

- **High quality**
  - FCS (Flex Calibration System)
  - Component Verification System (CVS)
  - Component Quantity Control (option)
  - Component Recognition Lighting (option)

- **Fast setup and changeover**
  - Feeder Position Indicator
  - Feeder Trolley
  - Component Verification System (CVS)

- **Reduced errors**
  - Bad Mark Reader
  - SOT direction check function

**Software**

- **IS**
  - Intelligent ShopFloor Solutions
  - IS server

**System overview**

IS is a floor productivity improvement support system that raises production preparation, scheduling, quality and monitoring to a new level by bringing together several related functions into one comprehensive software package. IS links managers, supervisors, and engineers the tools they need to run the most efficient production possible, thus reducing cost and improving productivity. Various tools allow workers at different levels to perform the tasks they need within a single software package.

- **IS server**
  - Placed on a server in the factory and is shared by all the software modules.

- **Line B**
  - Used to make the necessary S/W changes when necessary.

- **IS**
  - IS is the core of the entire system.

- **HLC**
  - HLC is the line control software that makes the modular concept work. On HLC, a single-production file can be created and saved and then optimized for the entire line in a single step. HLC will divide the production job among each machine in the line, considering each machine’s capabilities as it does. The result will be a file optimized and balanced over the entire line.

- **HLC (Host Line Computer)**

- **FLEXLINE CAD**
  - Juki’s flexible CAD is a data conversion application that reads a text file output by various CAD systems or other assembly machines and converts it to the format used by HLC, FX series, KE series machines, or CK-1. There are several supported CAD formats, but users may also define their own format using an interactive wizard and save that definition for later use.

- **EPU**
  - EPU is off-line programming software designed for a single machine. Using EPU software, the best feeder layout and optimized placement order can be achieved with the highest production efficiency. Like the FX series and the KE-2000 series, it has a component database to further decrease programming time.