**High-Speed Compact Modular Mounter**

**RS-1**

---

**The ultimate all-in-one mounter**

**High speed × versatily**

---

**Specification**

<table>
<thead>
<tr>
<th>Item</th>
<th>Fast Smart Modular Mounter RS-1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model</strong></td>
<td>Standard</td>
</tr>
<tr>
<td><strong>conveyor specification</strong></td>
<td>100mm conveyor extension, upstream and downstream</td>
</tr>
<tr>
<td><strong>Board size</strong></td>
<td>Optimum</td>
</tr>
<tr>
<td><strong>Component height</strong></td>
<td>Placement speed: 42,000CPH</td>
</tr>
<tr>
<td><strong>Component size</strong></td>
<td>Placement accuracy: ±35µm (Cpk:1.0)</td>
</tr>
<tr>
<td><strong>Feeder inputs</strong></td>
<td>Power supply: AC200～415V, 3-phases</td>
</tr>
<tr>
<td><strong>Operating air pressure</strong></td>
<td>0.5±0.05MPa</td>
</tr>
<tr>
<td><strong>Air consumption</strong></td>
<td>Machine dimensions (W×D×H): 1,500×1,810×1,440 mm</td>
</tr>
<tr>
<td><strong>Mass (approximate)</strong></td>
<td>Feeder,Splicing tape, Big foot, Offset placement after solder screen-printing Solder lighting</td>
</tr>
</tbody>
</table>

---

**Option**

- **Recognitions system**: 10/20/27/54 mm view camera
- **Operations system**: Rear-side operation unit
- **Inspection function**: Coplanarity sensor, Component Verification System (CVS)
- **Conveyor**: Conveyer extention/support pin/support sponge
- **Electrical protection**: CE compatible specification, Ground-fault interrupter
- **Force Control**: Force control unit, Force control nozzle
- **Software**: JaNets, IPS-NX, Flexline CAD

**Component handling and feeders**

- **Feeder Trolley**: RF/EF Dual servo, Electric tape feeder (RF/EF)
- **EF feeders**: Electric stick feeder, Matrix tray server TR5SR, TR5SN, TR5DN, Matrix tray changer TR6SN, TR6DN, Dual tray server TR1RB, Nonstop operation function, Tray Holder, IC collection belt, Tape reel mounting base (RF/EF), Splicer (RF/EF Trolley Power Station PA02)

**Others**

- **Nozzle, Splicing tape, Big foot**: Offset placement after solder screen-printing Solder lighting

---

*Please refer to the product specifications for details.*

---

**JUKI CORPORATION**

**JUKI AUTOMATION SYSTEMS CORPORATION**

**MANUFACTURER**: JUKI CORPORATION

**HEADQUARTERS**: 2-10-1 Takahara, Takasago, Hyogo 668-8551, JAPAN

**TODAY**: TEL.+81-774-239717 FAX.+81-774-23281

**http://www.juki.co.jp**

---

*Please refer to the product specifications for details.*
1. Feature of RS-1

**Feature1** Newly developed "Takumi Head" with changing recognition sensor height

For products with a high number of small chip components, the RS-1 can function as a high speed machine. For products with many large or odd-form parts, the RS-1 can run as a general purpose machine. The RS-1 is a true “all-in-one” machine that can handle a very wide range of PCB types in both high speed and flexible roles.

New Dynamic Height 8 nozzle placement head automatically adjusts the centering laser height to optimize placement speed. This head adjusts automatically based on the production program from 1mm to 25mm tall components in 5 different positions. Optimal speed and component flexibility are possible without the need to change the head unit.

**Feature2** Wide component range 0201 (metric) components supported

Wide component range
RS-1 supports components from 0201*1 (metric) up to 74mm square or 50x150 retangular parts. Component height up to 25mm.

**Feature3** New vision recognition technology

- Component polarity is detected and corrected automatically by the upward looking centering camera (VCS).
- Upside down components Special algorithms can detect components that are upside down and reject them.
- Small component handling Components down to 0201 (metric) are supported with the 10mm field of view camera option.

**Feature4** Auto tape advance function

The auto tape advance function reduces setup time by using the fiducial camera to advance new tapes to the first full pocket. Available for 8mm tape and components from 0402 (metric) to 3216.

**Feature5** Class leading speed, up to 42,000 cph

Class leading speed, up to 42,000 cph
Maximum speed of up to 42,000 cph*. This is made possible by a revolutionary head design that reduces the travel time and distance for every placement.

New RF feeders are smaller, thinner, and lighter
The new RF feeders are smaller and lighter, but still maintain the same high degree of positional accuracy. The thinner width allows up to 112 feeder inputs.*

**Feature6** Line Balancer

Optimum line balance and highest throughput
Changing the RS-1 functionality does not require head replacement. The revolutionary design adapts to the production requirements automatically. It can be used in-line with high speed chip placement machines to improve overall line productivity or to make the line more flexible for complex PCBs with a high number of large components.

Case Study 1 **[Without RS-1]**

Example PWB with 1000 chips, 50 large components. Products with high percentage of small chips results in poor utilization of flexible machines.

**[With RS-1]**

The flexible design for the RS-1 makes it scalable for smaller components and maintain high speed placement capability.

Case Study 2 **[Without RS-1]**

Example PWB with 500 chips, 400 large components. The flexible design for the RS-1 makes it scalable for smaller components and maintain high speed placement capability.

**[With RS-1]**

This RS-1 can change its function dynamically from high speed chip placement to flexible placement of large components. This improves optimization and line balancing for various products.

Case Study 3
2. Recognition technology

**Image recognition technology**

Component shape, lead and ball details are accurately captured using our VCS camera. Component problems such as missing ball detection or bent leads are also detected. A wide variety of components including BGAs and QFPs and many more are supported.

- Three color illumination
  - Optimal lighting color is used to accurately center different component types.
- Wide component range
  - A wide variety of components, including odd-form parts that require special nozzles, can be centered precisely.
- Improved centering speed
  - A new VCS unit can center up to 4 parts in a single image, reducing centering time by 25% with the 54mm field of view VCS. The 10mm and 27mm field of view cameras also support high speed centering and multi-imaging or larger components.

**JUKI’s proprietary laser recognition technology is flexible, accurate and reliable.**

A wide component range is available including parts as small as 03015 (metric), PLCCs, SOPs, QFPs and larger parts up to 50mm square. Laser centering is accurate, fast, and is not affected by variations in components such as lead brightness shape.

**Recognition algorithm**

Laser calculates the following data for each component:
- Component shape
- Center Angle Width
- Height
- Width

**8 placement nozzles can pick and center on-the-fly for high speed production**

Component centering is performed on-the-fly during the movement from the pick to the placement position using a laser unit built onto the head. High speed placement is possible by eliminating travel to a centering camera.

The path from picking to centering and placement is optimized for the fastest possible production speed.

**The component check function improves the quality of component placement.**

The component check function improves the quality of component placement. Component presence is monitored by the laser from pick to placement, reducing the chance for missing components.

- On-the-fly component detection
- Component state check
- Component end check
- Component fall check
- Release check

3. High Productivity

**Bank specification can be selected**

Feeder banks are available in either fixed or easy to replace trolley configurations.

- Fixed bank specification
- Exchange truck specification

**Ease-of-operation improved by automatic component measurement**

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

**Tray component feeding**

Tray parts can be supplied in a variety of tray changers and single tray holders. The compact TR8SR presents the trays for direct picking by the placement head and leaves 20 8mm tape feeder slots free on the rear side. The shuttle type tray changer, TR6, uses no feeder space and includes a conveyor that can be used for inspection. With the rear operation unit, better operator efficiency is possible.

**Flexible vision teaching**

Complicated programming of odd-shaped components is made easier by following step-by-step guidelines, reducing programming time significantly.

**Automated pre-production check list**

Operators can use the automated pre-production check list to make sure all required operations have been completed. Ensures consistency and reduces overlooked operations.

**Pick Position Auto-correction**

The feeder pick position is automatically adjusted based on centering results to improve simultaneous picking and increasing throughput.
4. High Quality

Incorrect component prevention - Component Verification System (CVS)

By measuring the resistance, capacitance, or polarity before production starts, the machine can prevent incorrect components from being placed. The new CVS unit can check six components simultaneously, reducing the check and changeover times.

- Check the Resistance, Capacitance and Polarity before production starts.
- Prevents incorrect component removal from being used.
- Prevents incorrect component placement.

Reduce errors due to solder paste alignment - Offset Placement After Solder Screen printing

The OPASS function uses the machine’s downward looking camera to check the location of solder paste vs. the pads and corrects the placement accordingly. This function reduces defects caused by misalignment of the paste on the pads.

Solder paste for fiducials

Solder printed pads can be used instead of fiducials for circuit boards that do not have fiducials. This is especially helpful on long PCBs that require double clamping and do not have a fiducial in the appropriate area.

Coplanarity sensor - checks balls and leads

Prevents placement of defective components by checking lead float of lead component and nick of ball component. High accurate and high speed coplanarity check will improve the products' reliability.

Proactive maintenance warnings

Dirty laser, low vacuum and upward looking camera conditions are all checked prior to production starting to warn the operator of potential problems and prevent defects.

5. Other options

Dual Tray Server TR1RB

The dual tray server (DTS) reduces the tray replacement time by 75% compared to a standard tray holder. It also leaves space for tape feeders or the feeder bank. The new DTS is 28% lighter than previous models to make changeover even easier.

Support sponge

Soft under board support reduces defects caused by PCB warpage. This unit uses soft pillars that will not damage components on the bottom side and do not require setup for each different PCB. They are easy to remove with a simple magnetic base.

Placement force control with Load cell option

Pick and placement force can be precisely controlled using the load cell option. The force for each nozzle is measured and applied during pick and placement to reduce the possibility of damaging sensitive components.

Non-stop Operation

Non-stop operation allows the operator to replace feeders while the machine continues to run at full speed.

Capable of long board production

It can be standardized up to 650 mm × 370 mm with one clamp and 950 × 370 mm with 2 clamps. Furthermore, by combining optional transport extension, it is possible to handle long board production up to 1,200 mm × 370 mm.

FCS (Flex Calibration System)

JUKI’s highly regarded easy 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)

Mini-signal light

The mini-signal light clearly shows operators which side of the machine has an empty feeder.

The IC collection belt

The IC collection belt provides a safe method to handle rejected parts while also protecting them from further damage. Belt pitch can be set for different size parts.