SM CONTACT · PIN INSERTION

PinInsert 3200

The smart way to shoot pins: full servo, vision-guided, verified.

Fully servo-driven insertion head, a liquid-lens vision system that measures every pin after insertion, and point-and-click recipe creation. Built for medium- and high-volume press-fit production in automotive, e-mobility and power electronics.



SERVO-DRIVEN HEAD

Servo insertion + motorized feeding

Dedicated servo for insertion depth and force, plus a servo-motorized pin feed synchronised electronically. No pneumatic feed, no cams.

LIQUID-LENS VISION

Measures what was inserted

Electronic focus change: XY hole check before insertion, then pin-tip position and inclination after insertion.

CLICK-TO-TEACH

New product in minutes

Create recipes from the camera image: click a hole, the insertion point is stored. No offline coordinate programming.

Why customers choose PinInsert 3200

Most pin inserters check the board. PinInsert 3200 also checks the result: every pin, every cycle.

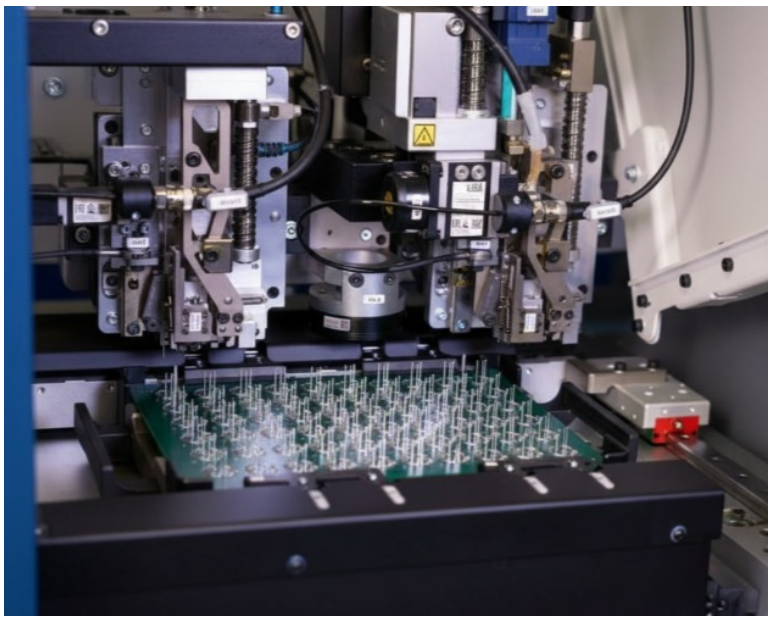
±0.05 mm	500 ms	400×400	60 mm
insertion accuracy (Cpk > 1.68)	cycle time per pin	max PCB size (mm)	max pin length (long version)

THE MACHINE

A complete pin-insertion cell



PinInsert 3200 with pin unreelers



Insertion area: servo heads and camera over the PCB

Built for high-mix, high-volume production

Press-fit and eye-of-the-needle pins up to 60 mm long and 1.5 × 1.5 mm cross section, on boards from 50 × 50 mm to 400 × 400 mm and 0.5 to 4 mm thick.

Quality & safety options

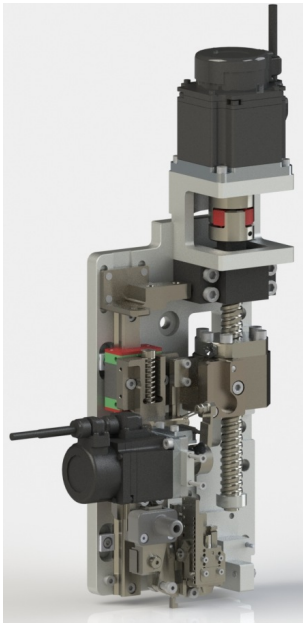
- **Insertion force control**
  Each pin compared to reference force; stop or alarm on deviation.
- **Pin tip inclination & rotation camera**
  Measures tip offset, inclination and rotation of each pin.
- **XY re-coordination of insertion points**
  Camera re-locates holes and corrects each insertion point.
- **Laser component position**
  Flags misplaced parts and halts until corrected.
- **Poka-Yoke reject handling**
  Machine resumes only once the defect is in the reject bin.
- **Data Matrix reader**
  Automatic program changeover and traceability.
- **Safety beams & lighting**
  Foreign-object detection in the work area.
- **Force data export**
  Insertion data exported to Excel.

TECHNOLOGY

Three advantages that set the standard

01 Full-servo insertion head

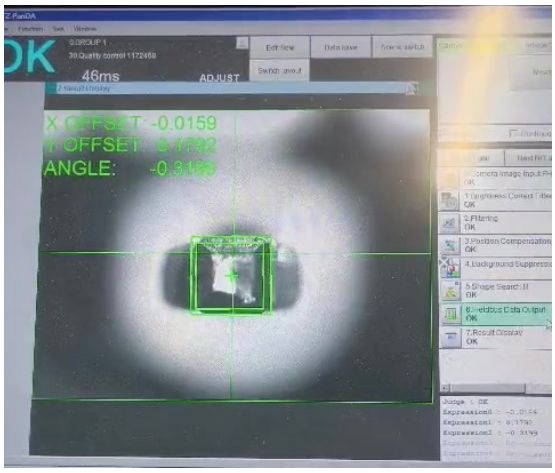
- **1 servo motor for insertion**: depth set by encoder and programmed in the editor to 0.01 mm, with no mechanical adjustment between series.
- **Motorized pin feeding**: a dedicated servo motor drives the pin feed, unlike the pneumatic feeders common on the market. Feed length and speed are programmable and electronically synchronised with the insertion stroke, for stable pin length, gentle handling of the strip and no feed adjustment when changing pin pitch.
- The head is part of a fully servo-driven machine: insertion, feeding and positioning axes are all under electronic control.
- Controlled force profile on every pin; force monitoring and Excel export (option).



Servo insertion head with motorized feeding

02 Liquid-lens vision: hole and pin tip

- The camera's **liquid lens changes focal distance electronically**, in milliseconds and with no moving parts.
- **Before insertion:** focus on the PCB, check XY coordinates of each hole and compensate PCB position errors.
- **After insertion:** refocus on the **pin tip** and compare it with the PCB hole: X/Y offset, **rotation** and **pin inclination** (overall straightness) are measured and shared.
- Inspection in about 40–46 ms per pin with OK/NG judgement and traceable data.



Pin-tip measurement: X/Y offset and angle, judged OK

03 Flexible recipe creation by camera

- **Click on a hole in the live camera image**: the new insertion point is stored in the recipe. No CAD import or offline programming needed.
- New product variants are created on the machine floor by the operator or process engineer in minutes.
- Combine with the Data Matrix reader (option) for automatic program changeover between product references.

1. Live camera image

2. Click the hole

3. Point saved to recipe

4. Production ready

SPECIFICATIONS & APPLICATIONS

Technical data

Cycle time	**500 ms per pin**
Insertion accuracy	**±0.05 mm (Cpk > 1.68)**
Pin max length	**25 mm (std) / 60 mm (long version)**
Pin max cross section	**1.5 × 1.5 mm**
Wire section (servo head)	**0.3 to 1.5 mm**
PCB size	**50 × 50 mm to 400 × 400 mm**
PCB thickness	**0.5 to 4 mm**
Insertion depth setting	**Encoder, programmable to 0.01 mm**
Part change in head	**approx. 15 min**
X / Y axes (option)	**Motorised, 400 mm stroke each**
Power supply	**220 V, 50 Hz, 10 A · 3.0 kW**
Air pressure	**6 bar**
Dimensions (W × D × H)	**1860 × 1730 × 1670 mm**
Conveyor height	**950 ± 30 mm, SMEMA compatible**
Weight (basic)	**approx. 1,500 kg**
Certification	**CE**

Pin types & feeding

- Press-fit and eye-of-the-needle pins
- Custom connector and terminal pins
- End-to-end, right-angle, bandolier and terminal heads
- Floor unreeler, carrier unreeler, terminal unreeler

Applications

- Automotive ECUs and motor controllers
- Power modules and inverters
- Battery management systems (BMS)
- Industrial controls, high-current assemblies
- PIN & PCB, metal, plastic, coil frame

See it on your own PCB

Send us your board and pin references: we run a trial insertion with full pin-tip and inclination measurement report.

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