

TRV-2000 Tray-Based Inspection System

Ultra high speed tray-to-tray/tray-to-tape component inspection system suitable for gull-wing, BGA and CSP packages.

The TRV-2000 is a state-of-the-art system designed to perform high speed inspection of components handled in JEDEC trays; tape and reel output is optional.

Key features include:

- ✓ Handles gull-wing, CSP and BGA packages.
- ✓ Performs 3D lead, mark and pin 1 inspection at up to 5,000 UPH with a single vision station and 10,000 UPH with dual vision stations.
- ✓ Empties and fills trays a complete row at a time to insure that parts are always available for inspection.
- ✓ Incorporates a walking beam concept for maximum throughput at the vision station.
- ✓ Quick and easy tray loading and unloading at an optimal height.
- ✓ Fast system changeover for different packages.
- ✓ All doors and panels are fully interlocked for safety.

Superior Performance

This ultra fast system incorporates the proven "walking beam" concept to achieve the highest possible throughput. Transport gantries utilize gang pick and place methodology providing high throughput at low transfer speed, minimizing system maintenance.

Efficient Component Handling

System design is such that the flow of components to and from the walking beam system and inspection stage insures that there is always a part to be inspected, maximizing throughput. Input and output gantries transport whole rows of devices at the same time between trays and pairs of machined input and output "shuttles". The shuttles index under the input and output positions of the walking beam mechanism. Once a shuttle is either filled or emptied it is moved to the respective input or output gantry location, and the second of the pair of shuttles moves into place under the walking beam.

Vision Inspection

Components are accurately staged (to better than 0,020 inches) on an illuminated pedestal that provides both back and top lighting simultaneously. Mirrors present side views of devices under test to the camera so that standoffs can be viewed and the resulting single, composite image is used to perform lead, pin 1 and mark inspection.



Machine Control

All basic machine functions are software controlled. During operation, a schematic provides complete system status at all times including pictorial representation of trays/devices. Status of sensors, motors and switches is also displayed.

Reject Handling

If one or more devices in an output shuttle is a reject, the complete row of devices is transported to a reject sorting fixture where "like" rejects and good parts are sorted into rows. When any row is complete, the output gantry transports it to the pass or relevant reject tray.

Fast Changeover

Changeover for a different device and tray pitch takes less than 30 minutes – tooling consists of four shuttles, a reject sorting fixture and two pick up head assemblies for the input and output gantries. The vision pedestal may require a change for correct backlighting. Software set-up includes vision system training and tray pitch selection for the machine control software.

General Specifications

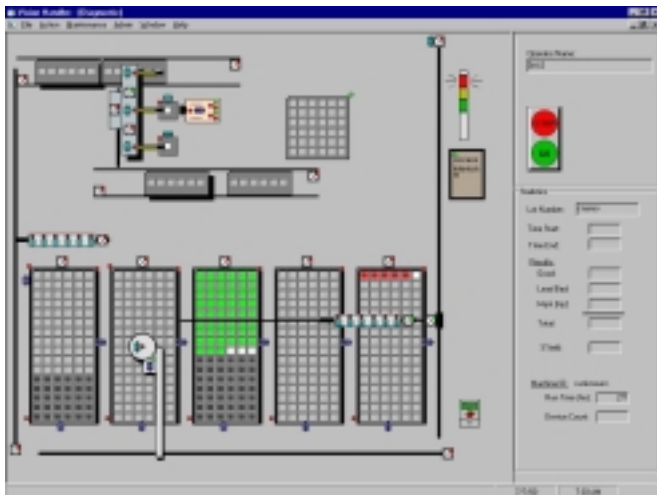
Dimensions: 51 x 55 x 58 inches (DxWxH)
1300 x 1400 x 1475 mm
Weight: 1750 lbs, 800 kg
Power: 220/240VAC, 50/60Hz, 1kW, single phase
Air: 70-90 PSI, 30 CFM clean, oil-free, dry air
4.5-6 bar, 1000 l/min clean, oil-free, dry air
Controls: Machine control software runs under Windows NT
Tray Stackers: 5 front loading units for INPUT, EMPTY, PASS, REJECT 1, REJECT 2
Capacities: 12 inch high stacks of thick or thin JEDEC trays
Tray Types: EIAJ optional

Vision System

Hardware: Pentium III running Windows NT
Frame Grabber
Camera
Inspection pedestal
Software: AVS-4000 (Other systems available)
Inspection: Lead - Space, Width, Span, Slant, Length, Coplanarity
Balls – Coplanarity, Pitch, XY Error, Missing Balls
Mark - Print Defects, Low Contrast, Wrong, Illegible
Pin 1 - Dimple, Notch, Chamfer, Mark
Accuracy: 0.0003 – 0.0005 inches
Repeatability: +/- 0.0004 inches or better
Mark Templates: Up to 4 for sequential inspection on fail – reduces throughput
Over-rejection: < 0.5%

Performance

Device types: TSOP, QFP, BGA, CSP
UPH: Up to 5,000 parts per hour with single vision station; up to 10,000 parts per hour with dual vision stations (10 x 10 QFP)



Run Production Screen

Vision Stage, Walking Beam and Input/Output Shuttle Fixtures



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