

TRIAD 05 AP

High Accuracy Assembly Cell

With a post-bonding accuracy of $\pm 0.5 \mu\text{m}$ using passive alignment method, the TRIAD 05 AP High Accuracy Assembly Cell ensures the most precise small device bonding.

Able to perform active alignment as well as passive alignment, the TRIAD 05 AP offers the latest evolution in bonding techniques (i.e. ultrasonic and laser welding, UV curing, etc...) and supports a broad range of applications (i.e. 3-D modules).

By design, the TRIAD 05 AP provides development and production capabilities on a single upgradeable and cost-effective platform with configurations ranging from the manual-loading version to the fully automatic in-line solution.



Features & Benefits

- The TRIAD 05 AP bonding arm low force and high resolution along all 6 axis, offer optimum process flexibility to bond & stack micro devices of various shapes and fragile materials.
- The optical super-imposing microscope optically mixes images of the upper and lower components and performs the decisive 6-axis alignment to achieve the highest alignment accuracy.
- Automated components loading systems allow complete hands-off and non-stop operation :
 - Dynamic/static waffle pack or GELPACK™
 - Diced wafer, tape-on-reel
 - Conveyor for in-line configuration
 - Lens dispenser with glue stamping system
- User friendly Windows-based graphical software for intuitive and easy operation in minutes.

Bonding Processes

- Die Bonding, Flip Chip Bonding
- Mass reflow, in-situ reflow
- Thermocompression, thermo-sonic, ultrasonic and adhesive bonding
- Fragile material compatibility : InP, GaAs, MCT...

Applications

- Chip-to-Chip, Chip-to-Substrate bonding
- RF & optoelectronic & photonic devices assembly
- MOEMS, MEMS, MCM...
- Customized tool for Micro Mechanics Assembly

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Technical Specifications

Process station

Component Size

Chip (Upper Component)	0.1 ~ 20 mm Thickness up to 25 mm
Substrate (Lower Component)	Up to 50 x 50 mm Thickness up to 22 mm

Bonding Arm : Universal Bonding Arm

Post-bonding Accuracy	$\pm 0.5 \mu\text{m}$ @ 3 sigma* (Passive alignment)
Motorized Leveling Travel	± 1.1 degrees Resolution 10 μrad
Z Travel	190mm, Resolution 0.03 μm
Theta control of the chip	± 45 degrees Resolution 3 μrad
Force	0.01 ~ 5 N, Resolution 0.01 N

Bonding Heads

Room Temperature	Up to sq. 22 mm
Heating	sq. 22 mm
Ultrasonic	55 ~ 65 kHz, 40 W max
UV	80 mW/cm ² @ 365 nm

Substrate Chucks

Room Temperature	Up to sq. 50 mm
Heating	sq. 22, 50 mm

Optics

XY Inspection Travel	20 x 30 mm Resolution 0.01 μm
Autocollimator Sensitivity	20 μrad on mirror
Digital Camera Resolution	0.55 μm per pixel (sub-pixel alignment capability)
Field of View	890 x 680 μm
Pattern Recognition System	Cognex™

Feed station

3-Axis Cartesian Transfer Robot

XY Loading area	325 x 472 mm Customized configuration of loading area Component transfer accuracy : $\pm 20 \mu\text{m}$
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Component Handling Head

Chip rotation	± 90 degrees, Resolution 0.002 degrees
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Optics

Field of View	1.1 x 0.8 mm
Illumination	LED 660 nm / dark and bright field

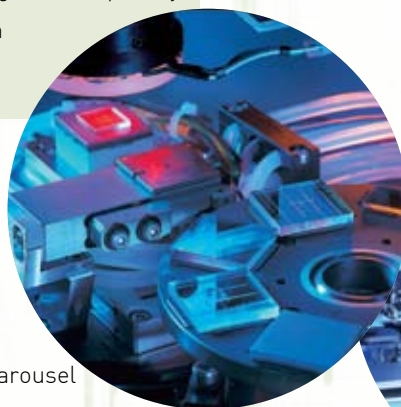
Pattern Recognition System	Cognex™
Analog Camera Resolution	1.5 $\mu\text{m}/\text{pixel}$ (sub-pixel alignment capability)

Available Component Loading Systems

Vacuum pipette storage (up to 8 pipettes), Waffle pack or GELPACK™, Automatic waffle tray feeder (2-inch or 4-inch), Tape-on-reel, Substrate/Package Conveyor

General Characteristics

Machine Footprint	2250 x 1250 mm
<i>Stand Alone Version</i>	1820 x 1630 mm
Machine Height	2100 mm
Machine Total Weight	2100 kg
<i>Stand Alone Version</i>	1500 kg
Electrical Power Supply	240/400 V - 8 kVA 50/60 Hz



Carousel



Inside view

*Process or Configuration Dependent

Data, design and specifications depend on individual process conditions and can vary according to equipment configurations. Not all specifications may be valid simultaneously. Illustrations, photos and specifications in this datasheet are not legally binding. Specifications are subject to change without prior notice.

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