

Inline 3D X-ray Inspection Machine for Power Module

3Xi-M200

Improved efficiency and accuracy
with these three key features

Unparalleled
Accuracy

High-Speed

Easy to Maintain



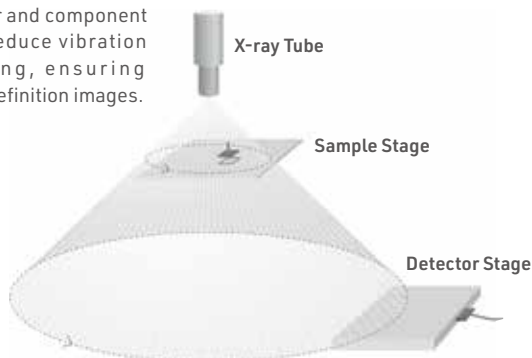
Unparalleled Accuracy

High-precision 3D inspection thanks to unique Planar CT technology

Complete 3D volumetric imaging assures reliable void detection in soldering layers typically invisible by optical inspection.

Unique hardware structure guarantees high-accuracy

The unique hardware structure features a fixed X-ray source, moving detector and component in parallel to reduce vibration during imaging, ensuring premium high-definition images.

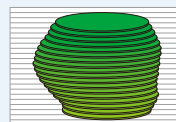


High-precision 3D data generation process

The Planar CT capturing process and calculation utilizes images from multiple angles to generate a full spread of hundreds of high-res cross-sectional images. The combined images provide highly accurate 3D data for incredible inspection accuracy.

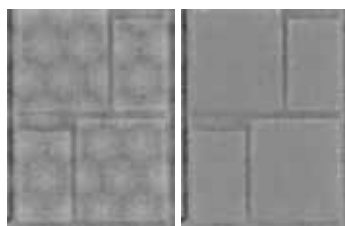
- 1 Multiple angled images
- 2 Unique image calculation
- 3 Hundreds of cross-sectional images are rendered

Accurate 3D inspection
data is generated



Heat sink shadows are removed

Image processing separates the soldering layer and heat sink, removing the pin-fin shadows that interfere with accurate void detection.



Before noise cancellation After noise cancellation

Highly accurate void inspection

Use of the noise cancellation filter accurately detects elusive thin voids.

The following image shows use of the noise cancellation filter in detecting thin voids. The left image (no filter) misses the void area clearly visible in the right image (filter applied).



Before noise cancellation After noise cancellation

High-Speed

Optimization of image capturing process

With both hardware and software simultaneously developed by Saki in-house, the image processing is optimized such that CT calculations present almost no delay to the inspection process.

Faster Cycle Time

The new conveyor design allows for loading of larger carriers - now up to 460mm x 600mm. Through batch imaging and inspection of multiple samples, cycle time is decreased, while operator workload and preparation time are also improved.

Ease of maintenance

Improved maintainability

With a revised lead protection design and sealed X-ray tube that greatly reduces X-ray exposure on the sensor, Saki's latest detector enjoys a significantly longer lifetime, resulting in fewer replacement parts and less maintenance.

Self-diagnosis function to prevent unplanned downtime

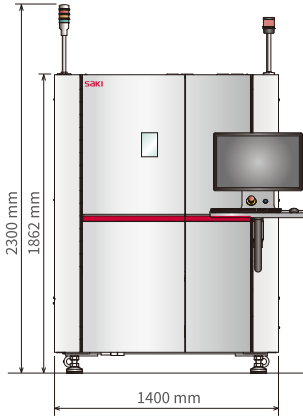
The self-diagnosis functionality prevents unexpected downtime. The early alarm system allows for planned maintenance and replacement of parts well before any system failure.



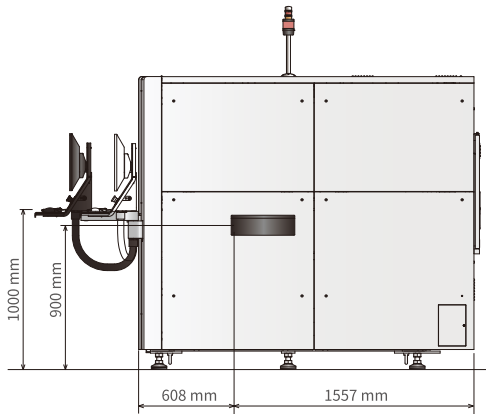
3Xi-M200

Dimensions

■ Front View



■ Side View



Hardware / Function Specifications

Model	3Xi-M200
Resolution	51 μm - 104 μm
Loading size	50 - 460 W x 140 - 440 L mm (1.97 - 18.12 W x 5.52 - 17.33 L in.) 50 W x 140 L - 460 W x 600 L mm (1.97 W x 5.52 L - 18.12 W x 23.63 L in.)*1
Loading Thickness	0.8 mm - 4.0 mm (0.032 - 0.157 in.) 6.0 mm or more (0.24 in. or more) *2
Warpage	2mm (0.08 in.) or less
Loading Clearance	Top: 68 mm (2.68 in.) Bottom: 40 mm (1.57 in.)
Inspection Categories	IGBT Module solder inspection, Presence/Absence, Misalignment, Tombstone, Bridge, Foreign material, Absence of solder, Insufficient solder, Dryjoint, Lifted bump, Lifted lead, Lifted chip, Fillet defect, and Void
Detector	Saki Detector V2
X-ray Source Type	Closed X-ray tube 180kV
X-ray leakage	0.5μSv/h or less
Transfer Conveyor Method	Flat belt transfer
Transfer Conveyor Height	880 - 920 mm (34.65 - 36.22 in.)
Transfer Conveyor Width Adjustment	Auto Width Adjustment
PC Specification OS	Windows10 IoT Enterprise 2019 EMB 64bit (Microsoft)
Electric Power Requirement and Power Consumption	Three-phase ~ 200V +/-10%, 50/60Hz 4.2 kVA With Cable 5m*3
Air Requirement	0.5 MPa @ ≥ 20L/min (ANR)
Usage Environment	15°C(59F) - 30°C (86F) / 15 - 80%RH (Non-condensing)
Noise Level	70 dB(A) or less
Dimensions	1400 W x 2165 D x 1862 H mm (55.12 W x 85.24 D x 73.31 H in.)
Weight	Approx. 5200 Kg (11464.04 lbs)

*1 With JIG type Conveyor Compatible and Loading size Expanded Compatible (Two Step Scan Feature) options

*2 With JIG type Conveyor Compatible option

*3 For operating this machine with other than three-phase 200V, the step-down transformer is necessary. Select the transformer from manufacturing option.

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