



## ***FOUR DIMENSIONS, INC.***

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# **Automatic Mercury Four-Point Probe\* Model M4PP3093**

## Features

- Fine Mercury Probe Contacts
- Clean and Safe Mercury Handling
- Automatic Multiple-Site Measurements
- Suitable for Mapping Ultra Shallow Ion Implanted Layer

## Description

This instrument comprises a plastic probe head for guiding four fine mercury columns upwards to probe on the wafer held downwards, a set of mechanism for automatic multiple-site mercury four-point probing, and an electronic and computing system for handling four-point probe measurements and data management.

Each of these fine mercury columns, functioning as one of the four-point probes, is refreshed before being pulled up to contact the wafer. Therefore it always has uniform and clean contact and does not stick to Si or SiO<sub>2</sub>. Each mercury reservoir, which is for supplying mercury to each probe, is sealed with rubber and will not spill even if it is capsized. No mercury vapor can be detected inside or outside of the instrument because the paths of mercury and vacuum are well sealed and have collectors attached.

Since the probe head is made of plastic and the probes are made of mercury, probing will not introduce damage to the wafer under test. And since mercury probing is so non-penetrating and so uniform in contact that its four-point probing has the least problem of leaking of test current through the junction of ultra shallow ion implanted layer. Many experiments have shown that mercury four-point probing is much more repeatable in measuring sheet resistivities of ultra shallow ion implanted layer than needle four-point probing.

Also, since the mercury is refreshed every time before contacting, there is no problem of oxidation or particle accumulation on the probe tip as other kinds of probe, especially very soft solid probe, does.



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### Specifications

#### **Measurements**

Wafer Size: 2" to 12"  
Edge Exclusion: 6mm  
Quick Check: up to 25 custom sites  
Mapping: based on up to 650 Cartesian or circular array measurement sites.  
Diameter Scan: any angle with integer mm interval  
Measurement Range: 10m $\Omega$ /sq. to 200k $\Omega$ /sq.  
Measurement Repeatability: < 0.2% (typical)  
Electronic Accuracy: < 0.1% (precision resistor)

#### **Mercury Probe Stage**

Probe Head: made of plastic  
Probe Tip Separation: 2mm  
Probe Tip Diameter: 200mm

#### **Computer and Software**

Pentium or More Advanced Computer for Windows Based OS  
Librarian Storage and Data Retrieval  
Color or Black and White Contour and 3D Maps  
Trend Charts, SPC  
SECS I, II, LAN, HSMS

#### **Facility Requirements**

Power: 100/115/230AC, 50Hz/60Hz, 1 kVA  
Vacuum: >28 inch Hg, >2 l/min  
Compressed Air: 60psi minimum at 2 l/min

#### **Cassette to Cassette Handling**

Available for 8" and 12" Wafers

\*Patent Pending