

### Introduction

The Model 6200 probe station is one of Micromanipulator's most popular probing station models. It is designed to provide an instrument that can find application in both high precision analytical probing and general probing tasks.

The Model 6200 features a highly stable base, platen and stage configuration. Stage controls are provided in a coarse (40 micron per degree) and fine (1.7 microns per degree) resolution range. The Model 6200 also features a quick-pullout stage feature which allows rapid repositioning of the wafer chuck or fast load/unload capability. With proper accessories the Model 6200 may be used for submicron level probing.

### Features and Benefits

- Coaxial, coarse/fine stage controls with fast stage pullout
- Fast platen lift and lock (3 positions) with coupled microscope lift with adjustable delay
- Highly stable, vibration isolated microscope post
- 1" x 1" X, Y microscope translation
- Separate microscope lift and lock mechanism
- Platen fine lift (jackscrew drive) 0.3  $\mu\text{m}$  per degree
- Rigid platen with webbed construction and linear lift accepts magnetic or vacuum based manipulators.

Probing of internal circuit paths may be achieved with the Model 6200 in an efficient manner. The dual resolution stage translation controls allow first rapid movement from die to die on a wafer then fine positioning of the test area underneath the probe tips.

Loading and precise sample positioning may be accomplished as follows:

1. Lift the probes and microscope from the probing area with the fast platen lift and coupled microscope lift mechanism.
2. Release the stage clutch and pull the stage to the station front. Load the wafer and secure it with the stage vacuum hold-down.
3. Engage the stage clutch and position the sample under the microscope with the coarse stage controls.
4. Lower the platen fast lift arm, then raise the probes slightly using the fine platen lift so the probes and the sample are both within the microscope depth of field.
5. Position the probing sites under the probes using the fine X, Y stage positioning and theta adjust controls.
6. Lower the probes to overdrive position with the platen fine lift and begin testing.

The Model 6200 also allows for the need to do high precision probing on a single die or packaged device. The stage may be quickly changed for a socket card holder without affecting stage planarity. The 6200's massive, machined base provides a high degree of vibration isolation. Its stable platen supports high resolution manipulators and optics are available with resolutions up to 0.4 microns and 4000X total magnification.

### Model 6200 Specifications

#### System Components

- Test station with fast stage pullout feature. Allows fast transition across wafer or easy loading of sample while maintaining precise positioning in probing area.

#### Platen

- Large stainless steel (magnetic) platen surface.
- Accepts up to 10 magnetic or vacuum based manipulators.
- Provides ten BNC style or optional triaxial probe signal strain reliefs.

#### Platen Control Features

- Range of fine lift travel is 1.187" (30mm) with 1.187" (30mm) of microscope lift delay.
- Fine lift resolution is 0.3  $\mu\text{m}$ .
- Fast lift via fast lift lever positioned at the left side of the probe station with 3 locking up positions.
- Platen fine lift allows submicron adjustment of probe or probe card vertical position.

#### X-Y Stage Movement

- Convenient fine and coarse stage movement in X and Y axis, with fast pullout stage feature for changing devices.



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## *Microscope and Support Post*

- Rigid microscope support post allows for gross microscope positioning range in excess of 4" and supports optional upgrades to high resolution manual, motorized or programmable X, Y, Z drives.
- Fast microscope lift with lock allows microscope to be cleared from probe

area without disturbing probes. Standard configuration is a dovetail slide, optional linear bearing is available.

## *Vacuum Stage*

- 6-inch wafer chucks are available either gold plated or lapped stainless steel.
- 360° chuck Theta rotation with coarse or fine control.
- Flatness equals  $\pm 12$  microns.
- Electrical isolation exceeds  $10^{10}$  Ohms at 500v DC (standard chuck).
- Chuck surface is electrically connected to a BNC connector at left rear of probe station.
- Single point grounding standard.
- Optional Low Noise (triaxial) chuck available with internal wiring to rear of station. Isolation exceed  $10^{12}$  at 500v DC.

## **Options for Model 6200**

- CAD interface software (the Probe Pilot).
- Cutting, malleable, shielded, specialty probes.
- High frequency, Microwave, Active probes.
- Thermal and thermal (hot)/cold chucks
- Hybrid probing adapters.
- Integral or disposable probe tips.
- Fixed probe card adapter.
- Light tight enclosure.
- Vibration isolation table.
- Video and still photography accessory systems.
- Motorized and Programmable manipulators.
- Probe card holders.
- Socket Stage Adapter for probing packaged devices.
- Laser Cutter.
- Motorized or Programmable microscope XYZ drive with pcProbe™ navigation system.
- Microscope Selection (choose one):

StereoZoom with up to 1000X (50X objective, 10X eyepieces, 2X zoom) magnification,

USMCO compound microscope with on-transformer control fiber optic illuminator or optional remote control. Includes 10X eyepieces, 2X, 10X and 20X objectives,

Mitutoyo FS-70 with up to 2000X (100X objective, 10X eyepieces, 2X zoom) magnification,

Thayes-Optem's A-ZOOM (120X to 4000X).

## **Model 6200 Specifications**

### *Stage*

- X and Y axis range  
6" x 6" (150mm x 150mm)
- Resolution  
40  $\mu\text{m}$ /degree coarse resolution  
1.7  $\mu\text{m}$ /degree fine resolution

### *Microscope*

- 1" x 1" x 2" X, Y and Z axis range
- Standard Precision (programmable)  $\pm 2.5 \mu\text{m}$  Repeatability & Accuracy
- Advanced Precision (programmable)  $\pm 1.5 \mu\text{m}$

### *Repeatability & Accuracy*

- Resolution  
0.1  $\mu\text{m}$  resolution, motorized or programmable  
12.5  $\mu\text{m}$  resolution, standard manual  
1.7  $\mu\text{m}$  resolution, high resolution manual

### *Platen*

- 1" (25.4mm) Z axis range
- 1" (25.4mm) Microscope lift delay
- 0.3  $\mu\text{m}$ /degree fine lift resolution

### *Chuck*

- $\pm 12 \mu\text{m}$  Surface flatness
- 360 degrees Theta range

### *Facility Requirements*

- Power 100-240v AC  
1.0/0.5 ampere  
60/50 Hz
- Vacuum 20 inch Hg

### *Test Station Dimensions*

- Footprint (Width x Depth)  
22.75" x 23.35" (57.7x59.3cm)
- Width, Depth, Height  
28.5" x 26.75" x 21.5"  
(72.3x67.9x54.6cm)
- Weight: 246 lb. (542.3 kg)

### *Construction*

- Material: Machined aluminum plate and magnetic stainless
- Finish: Grained black anodized and grained natural finish