

Introduction

Many MEMS are designed to operate in a vacuum or in special environments with a controlled atmosphere and temperature. Dust free, moisture free, vacuum environment or special inert atmosphere requirements may require the use of a vacuum probe station. Micromanipulator's VACP200 (programmable) and VACM200 (motorized) Probe Stations are engineered to meet these exacting environmental conditions.

Below are common applications for the VACP200 and VACM200:

- RF MEMS (special atmosphere or vacuum).
- Optical switching micro-mirrors used in optical switching (dust free).
- Resonator elements including accelerometers and gyros (dust free).
- Microbolometers (uncooled thermal detector arrays) for IR imaging (vacuum).
- Pressure sensors (vacuum).
- Condensation-free (corrosion reduction).
- Chemical sensors (controlled atmosphere and temperature).
- Any MEMS designed for aerospace applications (vacuum).

Device Tests

The VACP200 and VACM200 are designed to probe up to 8" (200mm) wafers, pieces, die or packaged parts.

Optical System

The VACP200 and VACM200 probe stations include a laser-ready Thales-Optem A-Zoom microscope with a 40X zoom body and a long working distance 10X objective. This microscope was selected in order to provide a wide range of image options without the problem of changing microscope objectives. Users can observe the device under test with a wide field-of-view then magnify the area of interest with simple microscope controls.

In the programmable model VACP200 the image from the

A-Zoom camera is displayed on the computer monitor screen to provide integrated features. In the motorized model VACM200 the image is displayed on a color video monitor.

Since the microscope is mounted on the top of the vacuum chamber, just above the optical window, the image is held steady relative to the sample which eliminates image vibration.

Automated controls

Automated chamber open/close and evacuation is standard on the Micromanipulator VACP200 and VACM200 for ease of use and operator safety. The entire chamber top is automatically moved away for easy access and setup of the test chamber.

The programmable version includes *ease of use* click and drag movement control plus a range of software control features to help the operator to probe efficiently. Standard software on the programmable version includes wafer map, in-die probing and the option of pattern recognition functions.

Vacuum

The Micromanipulator VACP200 and VACM200 probe stations are designed for probing applications (such as optical MEMS) which require low pressure or vacuum. Pump down is efficient from initiation of the chamber closure to reaching an operational vacuum.



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A1014758 rev 4 © 9/05

Specifications subject to change without notice.

Thermal Testing

The VACP200 and VACM200 may be used with the Micromanipulator thermal chuck system for operation and control of temperatures from -40° to +150°C. The Micromanipulator thermal chuck system is designed for precise temperature control plus quick heat-up and cool-down without overshooting the set temperature.

Multiple High Resolution Manipulators plus a Probe Card

Individual manipulators (up to 6) and/or a probe card may be used to contact the device under test. Probe contact is stable, allowing long term tests to be completed.

High Frequency/RF Testing

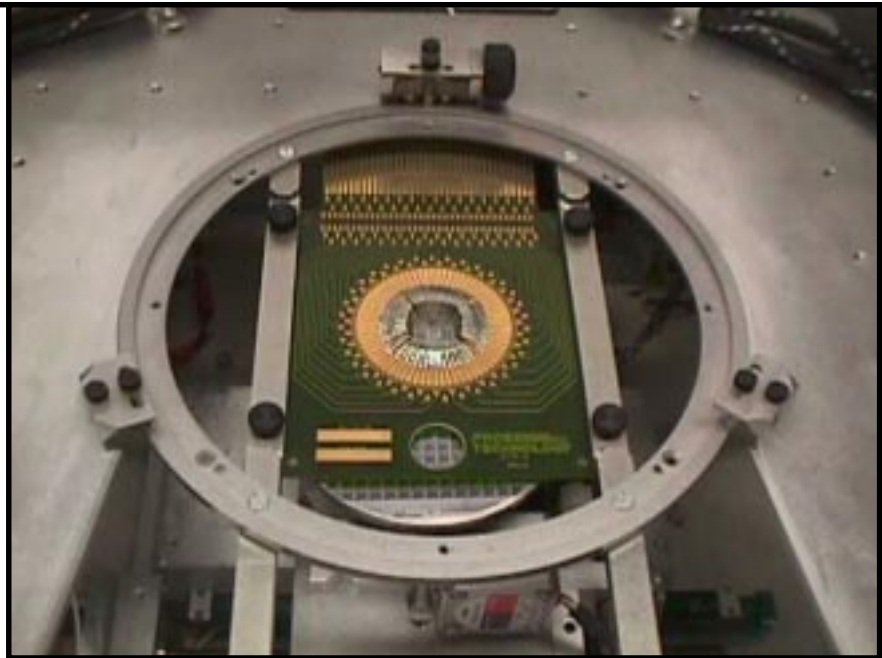
The VACP200 and VACM200 are compatible with high frequency Picoprobe active and passive probes.

Low Current Testing

The VACP200 and VACM200 are easily configured for low current, low noise measurements. A standard light shield feature enhances the vacuum chamber's natural RFI/EMI and light shielding properties. Plus the station is designed with low noise cables and a triaxial shielding needed for femtoamp and attoamp measurements.

Laser Cutter

The VACP200 and VACM200 include an A-Zoom microscope which is laser cutter ready and may be used with green (532nm), IR (1064nm) and UV (355nm) laser wavelengths.



VACP200 and VACM200 Probers support 4.5" probe cards.

Vibration Isolation

The entire probe chamber is built into an integrated active and passive vibration isolation system.

Base Programmable System VACP200

Description: Programmable 8" (200mm) probe station in vacuum chamber with light optics

- * 8" (200mm) ambient wafer chuck with mechanical hold down mechanism and interface cable
- * The mechanical hold down mechanism supports 4", 6", and 8" wafers as well as small pieces measuring 0.4" square or larger
- * 8"x8" (200x200mm) X-Y stage movement and Z platen movement
- * "Microscope movement" in X-Y
- * Chuck Theta movement, programmable
- * Cool able platen (Required to insure probe stability if using 1 or more manipulators, and or a thermal chuck)
- * Platen is probe card compatible for standard micromanipulator probe card holder
- * System/Platen allows for mounting/using up to 6 manipulators (no manipulators are included, order manipulators separately).
- * Windows based Pentium PC for programmable control with monitor
- * Drive electronics and PC housed in separate control cart
- * Integrated probe station and manipulator control software with integrated video functions
- * Vacuum chamber enclosing chuck, stage, platen and manipulators
- * Vacuum chamber controls for opening, closing, pump down, and vent
- * Mechanical roughing pump and turbo pump
- * (7) high isolation coaxial vacuum feed through connectors (for chuck and optional manipulators (up to 6)) mounted on one (1) panel
- * Three (3) blank panels for customizing chamber feed through ports
- * Integrated vibration isolation for vacuum chamber
- * Thales-Optem A-Zoom microscope, 40X zoom body and Tri-light laser cutter compatible
- * 10X light microscope objective
- * Installation and training
- * 1-year warranty

Probe Tips

Any 7 series tip may be used.

Standard Software Package (VACP-200 only)

pcProbe Launch: software for initial basic program setup; activates computer software needed to accept control commands plus activates joystick control and optional MicroTouch™ knobs.

pcProbe Navigation: software for controlling system functions from screen buttons and value entry fields. Features include: jog/index movement selection, speed controls, illuminator on/off, stage/manipulator device selection, X-Y and column-row position set and readout, chuck theta control, align, set reference, set coordinates, Z up/down set and controls, set index size, set die size, auto raise/lower, overdrive set and control.

pcVideo: software for displaying and integrating video camera output to software control. Features include: Click and drag motion control X-Y for stage or manipulators, measurement functions, video image capture and save/freeze image.

pcProbe Wafer: software for wafer map station control testing. Features include: die selection, test pattern, and die test status.

pcProbe In Die: software to allow random positioning of programmable elements (stage/manipulators). This program linked with pcWafer will



Chamber control panel.

allow the system to position manipulators in a random location (not index move) within each die.

pcSetup: software which allows for setup routines to be displayed, saved and recalled. This is useful for occasional users to step them through the setup procedure specific to their needs.

pcEmulate: software program to accept any tester program with an EG2001 prober driver. Emulates EG2001 tester.

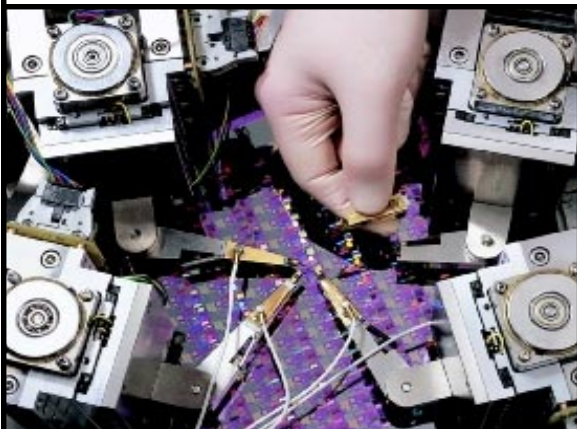
Optional Software Package pcProbe-VX

pcPattern Recognition: software which can be taught to recognize a specific pattern and make fine adjustments to X-Y stage position. This feature is especially useful with thermal probing where thermal expansion and shrinkage can move touchdown pads off of original settings and is available for the VACP200 only.

Available Options

- Chamber purge gas input controls and fittings.
- Partial pressure control (Requires cooling hardware for turbo pump).

- MicroTouch™ knobs for control of programmable/motorized station.
- A total of 6 manipulators are available as an option; ordered at the time of the station order. Manipulators require the purchase of probe holders and an Environmental Control Cabinet.
- Probe holders and high isolation interface cables.
- Probe card holder for 8" (200mm) probe cards.
- Additional/custom vacuum feed through panels with up to 360 connections.
- Active and Passive high frequency probes (special pass-through panel required).
- Touchdown sense module.
- Thermal chuck systems: ambient, zero or -40° to +150°C. Thermal chucks require the purchase of an Environmental Control Cabinet.
- Special sample holders.
- View port side panel mounted in feed through ports.
- Second microscope for open chamber work.
- Laser cutters from New Wave.
- Additional standard light objectives for A-Zoom.
- Eyepieces for A-Zoom microscope.
- NAVCAM for A-Zoom microscope.
- Additional training.
- Computer upgrade (VACP200 only).



Changing probe tips inside the vacuum chamber is easy.

Feed through connections shown on side of the Prober.

