SEMIPROBE PS4L-M6-PS4L-M8 High Frequency Wafer Probe Station Instruction Manual

Contents

SEMIPROBE PS4L-M6-PS4L-M8 High Frequency Wafer Probe Station

Product Usage Instructions

- Place the M-8 manual probe station on a stable surface.
- Ensure all components are securely attached and aligned.
- Connect any necessary accessories such as manipulators or probe arms.
- Turn on the power to the probe station.
- Adjust the manual X-Y stage for quick movements across the wafer.
- Use the micrometer controls for precise probe tip alignment.
- Perform measurements on wafers or individual parts as needed.

Introduction

- Example configuration pictured above: M-8 manual probe station with a vibration isolation table incorporating a rapid advance wafer stage, 200 mm tilting chuck, platen with linear lift, DC manipulators, compound optics and CCTV system.
- PS4L systems are modular and configured to suit customers' specific requirements, see below for more example applications and configurations.

MAJOR APPLICATIONS/MARKETS SERVED:

- Device Characterization, MEMS, Optoelectronics, HF/Microwave, High Power, Photovoltaic, Failure Analysis, Research, Material Science and more.
- The SemiProbe M-8 is the most modular and flexible 200 mm manual probe system available today.
- It is built using our patented Probe System for Life (PS4L) architecture, which provides unsurpassed flexibility and significant capital equipment savings.
- With the PS4L, customers can purchase a manual 200 mm system that meets their precise specifications and requirements.
- The Probe System for Life (PS4L) family of wafer probing systems is designed based on SemiProbe's patented adaptive architecture.
- Unlike traditional probe systems, all foundation modules – bases, stages, chucks, microscope mounts, microscope movements, optics, manipulators, and more – are interchangeable, making the PS4L the consummate solution for many different applications and budgets.
- This unique modular design enables customers to acquire test capabilities that precisely match their requirements.
- More importantly, as the environment or test conditions change, the PS4L can easily be field-upgraded to meet these new demands.
- With this design philosophy, PS4L customers realize substantial time and cost savings over traditional probe systems because they do not need to invest in a new platform when wafer size, levels of automation, or test requirements change.
- A complete line of accessories is available for all systems including probe card holders, manipulators, probe arms & bases, probe tips, thermal chucks, environmental chambers, lasers, optics, CCTV systems, vibration isolation tables, dark boxes,s and more.

FEATURES & BENEFITS

- 200 mm manual system with an upgrade path to a 200 mm semiautomatic system
- All key components are interchangeable which enables the system to easily be configured to meet applications and budgets – present and future.
- Software and hardware modules provide a perpetual field upgrade path.

Semiautomatic & Automatic Configurations

PROBE SYSTEM FOR LIFE (PS4L): Manual, Semiautomatic & Automatic Configurations

- SemiProbe's PS4L-M manual range of wafer probe equipment is ideal for customers that require advanced wafer probing equipment without motorized device alignment.
- A rapid advance manual X-Y stage enables quick stage movements across the wafer, with fine micrometer controls for precise probe tip alignment.
- As the user's environment or test requirements change, the PS4L manual systems can be field upgraded with enhanced features or levels of automation, turning a manual prober into a semiautomatic or even fully automatic system.

PROBE SYSTEM FOR LIFE – MANUAL (PS4L-M): Example Customer Configurations

PS4L-M8 Configured for High Frequency Test

- The customer required a general-purpose 200 mm manual high frequency (HF) wafer probe station designed to perform measurements on whole wafers and on individual diced parts mounted on tape, over a variety of higher frequency ranges.
- 'The configuration included individual manual manipulators with standard west/east HF probe arms for GS, SG, GSG, differential, and multi-contact wedges operating from DC to 40 GHz. In addition, the customer needed the ability to add manual manipulators for DC bias and a probe card holder for probe cards."

PS4L-M8 Configured for Double-Sided Test

- The customer required a manual double-sided probe station (DSP) system to test silicon photonic chips and wafers using probe cards and manipulators.
- The top side of the device would be biased, and the backside of the device had a light output that was captured by a detector. The detector was mounted on a manual X, Y, Z and theta stage.
- The devices tested had a variety of dimensions, so a universal mechanically clamping chip carrier was designed to hold the devices. Carriers for different-size wafers were also required.

PS4L-M6 Configured for Magnetic Stimulation

- The customer required a magnetic stimulation manual probe station to test 150 mm MRAM wafers using a magnet placed underneath the device that could be moved in X, Y, Z and theta.
- The device would be contacted from the top with up to five manual three-axis manipulators with coaxial probe arms and DC probes while being stimulated by the magnet located beneath the device.
- The customer also needed the ability to test the devices from the top at temperatures ranging from ambient to 225 °C.

PS4L-M6 Configured for High Power Testing

- The customer required a flexible probing solution that would allow them to test wafers with voltage up to 3kV.
- Volume was low, therefore a manual probe system with manual manipulators and a variety of probe arms were desired.
- The probe system would get interfaced to a Keysight B1505 and due to lethal voltage levels required to test the devices, a safety enclosure was required.
- The system also had to pass a Canadian Standards Association (CSA Group) inspection.

PS4L-M8 Configured for MEMS Devices

- The customer required a 200 mm capable manual probe station to test silicon MEMS wafers, integrated with a Polytec Motion Analyzer.
- The motion analyzer would measure a variety of MEMS devices while in-plane and out-of-plane. The wafer chuck would need to be tilted in a variety of directions.
- The devices would be contacted with a probe card as well as individual manipulators with coaxial probe arms and DC probe needles.

- PS4L-M12 Configured for Device Characterization
- The customer required a 300mm manual wafer probe station for device characterization.
- Due to initial demand, a manual system was purchased that would later be automated as volumes and requirements increased.
- Configured on an antivibration table, the system included a compound microscope with four turrets capable of up to 4000x magnification.
- Four coaxial DC probe arms and individual manipulators were used to connect the devices under test.

SPECIFICATIONS

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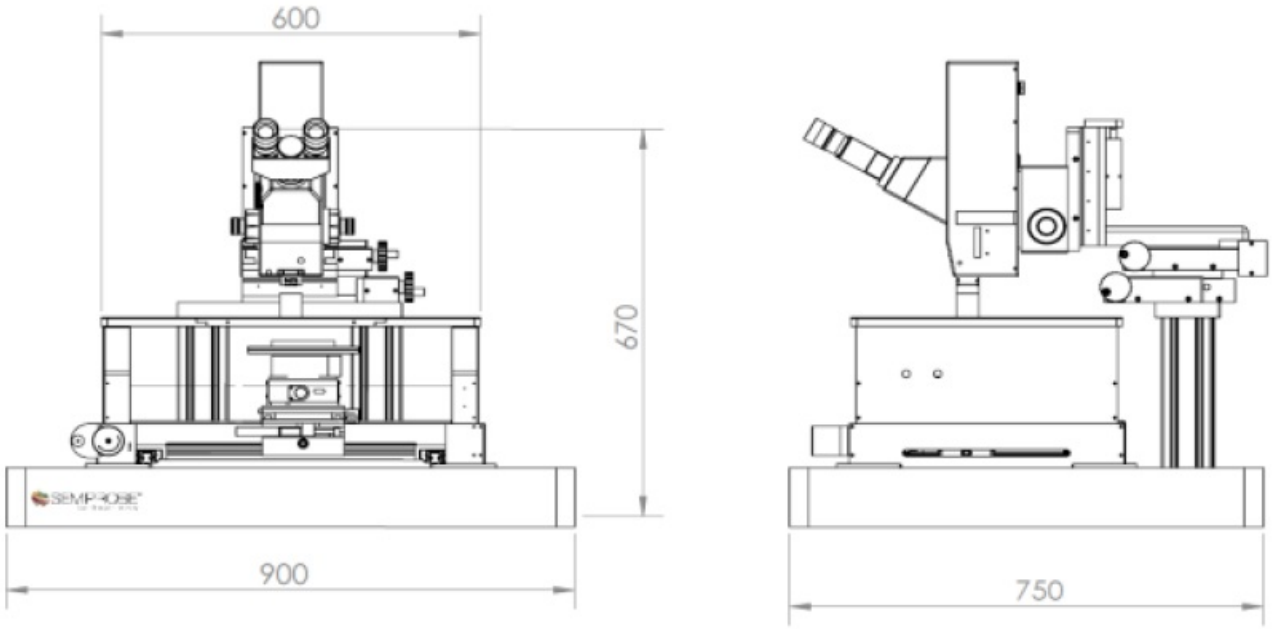
Dimensions	900 mm x 650 mm x 750 mm (35.5” x 25.4” x 29.5”) (W,H, L) – with optics

Weight	75 Kg (165 lbs.)
Chuck Stage XY Movement	Rapid align with coarse and fine stage movements – coarse >200 mm, fine is 2 5 mm (X, Y)
	Travel: Fine X, Y stage movement of 25 mm via precision micrometers
	Planarity: +/- 7.5 µm over a travel range
	Resolution: 5 µm
	Stage Types: Rapid Align (standard), coaxial and programmable (optional)
Chuck Stage Z Movement	Z Travel: >20 mm with a precision micrometer
Theta Movement	Travel: Coarse (360 degrees) and fine (>10 degrees) with theta locking knob
Chucks	Vacuum or mechanical clamping, round or square, triaxial, HF, HV/HC, ambient , thermal & custom
	Handle die, waffle packs, sawn wafers on the frame, broken wafers, and full waf ers up to 200 mm
	Nickel-plated steel with concentric vacuum rings (standard), and other plating materials are available
	Planarity: 5 µm
Platen	Aluminum with stainless steel top with removable front wedge 360-degree mani pulator placement
	Manipulator fixation – magnetic (standard), vacuum (optional with vacuum mani fold kit)
Platen Movement	Platen Lift: Choice of fixed or adjustable (linear)
	Adjustable: Coarse – 40 mm, Fine – 200 um contact/separation stroke via lever – lockable
Microscope Mounting/Movem ent	Mounting – Boom, Post or Bridge

	Movement – Manual or Programmable – 50 x 50 mm, 50 x 75 mm, 100 x 100 m m and 200 x 200 mm
Microscope (Optics)	Stereo Zoom, Zoom Tube, A-Zoom or Compound Microscope
Utilities	Power: AC 110/220V AC 50-60 Hz 20A
	Vacuum: 23 Hg or -0.8 bar
Note: Data and specifications vary depending on probe system configurations and accessories	

PHYSICAL DIMENSIONS



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FAQ

- **Q:** Can the M-8 manual probe station be upgraded?
- **A:** Yes, the M-8 probe station can be field-upgraded with enhanced features or levels of automation to meet changing requirements.
- **Q:** What accessories are available for the M-8 probe station?
- **A:** A complete line of accessories including probe card holders, manipulators, probe arms & bases, probe tips, thermal chucks,\ environmental chambers, lasers, optics, CCTV systems, vibration isolation tables, dark boxes, and more are available for the M-8 probe station.

Documents / Resources

	SEMIPROBE PS4L-M6-PS4L-M8 High Frequency Wafer Probe Station [pdf] Instruction Manual PS4L-M6, PS4L-M8, PS4L-M6-PS4L-M8 High Frequency Wafer Probe Station, PS4L-M6-PS4L-M8, High Frequency Wafer Probe Station, Frequency Wafer Probe Station, Wafer Probe Station, Probe Station

References

- User Manual