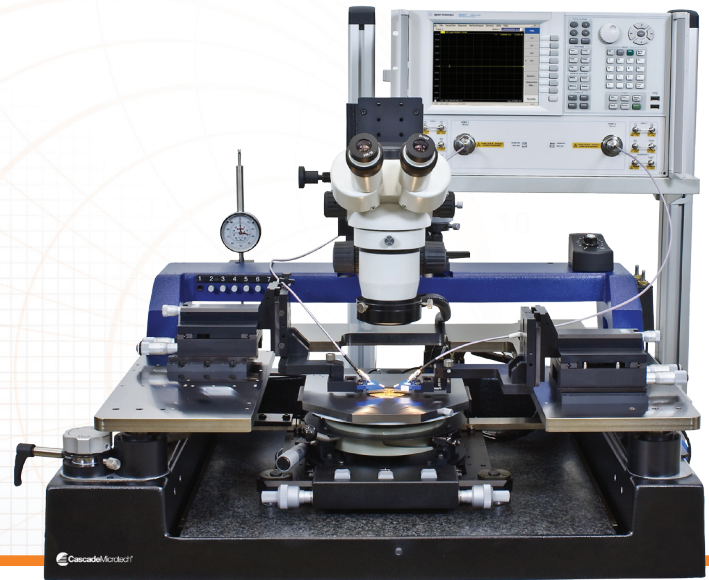


# PM8

## 200 mm Manual Probe System

### DATA SHEET



The PM8 is designed to provide a highly stable, ergonomic and flexible probing platform for precise analytical probing applications up to 200 mm, such as device and wafer characterizations, failure analysis (FA), RF/mmW and sub-THz probing, opto-engineering and MEMS.

The innovative fine-glide chuck stage offers both wide-range coarse movement and micrometer-level fine movement, simplifying precision measurements. The granite plate can easily withstand any thermal or mechanical influences and therefore ensures complete system stability during testing. The solid structure of the PM8 makes it ideal for all RF and mm-wave applications up to sub-THz range and beyond. These RF tests are supported by the WinCal XE™ calibration software, including LRRM, LRM+, NIST-style TRL and hybrid calibration methods.

The unique movable microscope bridge option provides an easy and ergonomic coarse and fine adjustment of the observation system of up to 200 mm, making all FA and inspection tasks and wafer-level reliability (WLR) tests easy.

Ergonomically, the PM8 was designed with the operator in mind. All controls are located to provide comfortable, effortless control.

The PM8 can be upgraded with a variety of accessories, such as laser cutters and the remote-controlled manual positioners for FA applications and chucks with special designs for calibration substrates and burnishing pads for high-frequency applications. Probe cards can be easily used for testing, and packaged parts can be tested with minimum setup adjustment.

### FEATURES / BENEFITS

Flexibility	Ideal for FA, WLR, RF/mmW, sub-THz and MEMS applications Extensive accessories available, such as laser cutters and a wide range of equipment for RF test Compatible with probe cards and/or packaged parts
Stability	Fine-glide chuck stage on highly-stable granite base Ideal for sub-micron probing Active platen cooling for thermal stability Solid structure Superior vibration attenuation
Ease of use	Low-profile, straightforward design for easy and ergonomic operation Fast, independent X-Y chuck stage movement Simple and easy to use microscope

## MECHANICAL PERFORMANCE

### Chuck Stage

Travel	Coarse: 200 mm x 200 mm (8.0 inch x 8.0 inch) Fine: 10 mm x 10 mm (0.4 inch x 0.4 inch)
Fine-travel resolution	< 1.0 $\mu\text{m}$ (0.04 mils) (~0.8 mm/rev)
Feedback system	Visual position indicator for fine movement with micrometer screw
Z load stroke	10 mm
Z load stroke repeatability	$\leq 2 \mu\text{m}$
Theta travel	$\pm 8.5^\circ$
Theta resolution	$< 6.75 \times 10^{-30}$ (< $\pm 5 \mu\text{m}$ at wafer edge)

### Manual Microscope Stage (Fixed Bridge)

Travel range	50 mm x 50 mm (2.1 inch x 2.1 inch) / 100 mm x 100 mm (4.0 inch x 4.0 inch)
Resolution	$\leq 5 \mu\text{m}$ (0.2 mils)
Scope lift	Manual: Tilt-back or linear pneumatic

### Manual Microscope Stage (Movable Bridge)

Travel range	200 mm x 200 mm (8.0 inch x 8.0 inch)
Resolution	Coarse: 88 mm (3.46 inch)/ rev. Fine: 250 $\mu\text{m}$ (9.8 mils)/ rev.
Scope lift	Manual: Tilt-back

### Programmable Microscope Stage \*

Travel range	50 mm x 50 mm (2.0 inch x 2.0 inch)
Resolution	0.25 $\mu\text{m}$ (0.01 mils)
Scope lift	Programmable, 130 mm

\*ProberBench electronics required for manual systems (P/N 157-137).

## PHYSICAL DIMENSIONS

### Station Platform with Fixed Bridge\*\*

Station dimensions	750 mm (W) x 700 mm (D) x 527 mm (H) (29.5 in. x 27.6 in. x 20.7 in.)
Weight	130 kg (59 lb.)

### Station Platform with Moveable Bridge \*\*

Station dimensions	784 mm (W) x 615 mm (D) x 530 mm (H) (30.9 in. x 24.2 in. x 20.9 in.)
Weight	170 kg (77 lb)

\*\*Station accessories, such as cameras or laser cutters, may increase the total height to 900 mm (35.4 in.)

## PLATEN SYSTEM

### Platen

Platen space (typical)	DC platen: Able to mount up to eight DPP2xx/DPP3xx/DPP4xx/RPP210 or up to twelve DPP105 positioners RF platen: Able to mount up to four RPP305 and LAP positioners
Z-height adjustment range	45.0 mm (1.77 inch)
Minimum platen-to-chuck height	17 mm – 22 mm (depending on platen)
Separation lift	400 µm (15.7 mils)
Separation repeatability	< 1 µm (0.04 mils)
Vertical rigidity /force	5 µm/10N (0.2 mils / 2.2 lb.)
Accessory mounting options	DC platen: Magnetic, vacuum RF platen: Bolt-down, magnetic

### Standard Wafer Chuck

Diameter	200 mm
Material	Stainless steel
Supported DUT sizes	Shards or wafers 25 mm (1 inch) through 200 mm (8 inch)
Vacuum ring diameter	Universal: 4 mm, 7 mm, 22 mm, 42 mm, 66 mm, 88 mm, 110 mm, 132 mm, 176 mm Standard: 22 mm, 42 mm, 66 mm, 88 mm, 110 mm, 132 mm, 176 mm
Vacuum ring actuation	Universal: All connected in meander shape, center hole 1.5 mm diameter Standard: Mechanically selected, center hole 1.0 mm diameter
Chuck surface	Planar with centric engraved vacuum holes
Surface planarity	≤ ± 6 µm

### RF Wafer Chuck

Diameter	200 mm with two additional AUX areas
Material	Stainless steel with HF/OPTO surface (flat with 0.7 mm holes)
Supported DUT sizes	Main: Single DUTs down to 3 mm x 5 mm size or wafers 25 mm (1 inch) through 200 mm (8 inch) AUX: Up to 18 mm x 26 mm (1 inch x 0.7 inch) each
Vacuum hole sections (diameter)	22 mm, 42 mm, 66 mm, 88 mm, 110 mm, 132 mm, 176 mm (four holes in center with 2.5 mm x 4.3 mm distance)
Vacuum holes actuation	Mechanically selected
Chuck surface	Planar with 0.7 mm diameter holes in centric sections
Surface planarity	≤ ± 6 µm

## NON-THERMAL CHUCKS

Note: Results measured with non-thermal chuck at standard probing height (10,000 µm) with chuck in a dry environment. Moisture in the chuck may degrade performance.

### Chuck Stage

Standard chuck performance (Non triaxial)	
Operation voltage	Standard: In accordance with EC 61010, higher certificates available on request
Isolation*	> 2 GΩ
System electrical performance (Triaxial)	
Probe leakage**	≤ 500 fA (typical)
Probe capacitance***	50 fF – 80 fF (typical)

\* Factory test with multimeter with maximum 2 GΩ range

\*\*Verified with DCP-150K probes and 4 x 2 m SSMC triaxial cables. Test condition: Force 10 V on each SMU. Integration time: Long. Limit range: Fixed 10 pA measure current.

Note: Cascade Microtech has no influence on the surrounding equipment, which might induce distracting peaks. Leakage current levels depend on surrounding atmosphere and are valid for low humidity cases.

\*\*\* Typically for triaxial arm setup (1 kHz frequency, maximum 3 m cable). Achievable measurement capacitance resolutions depend mainly on the equipment and measurement frequency used.

## THERMAL CHUCKS (ATT A200)

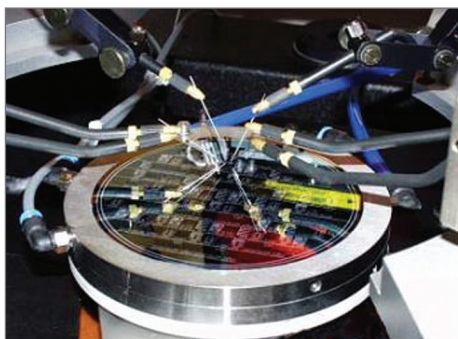
Note: Results measured with a thermal chuck at standard probing height with a chuck in a dry environment. Moisture in the chuck may degrade performance.

Temperature range	+25°C to +200°C
Extended temperature range	-30°C to +400°C
Temperature stability	±0.1°C
Temperature accuracy	±0.5°C
Transition time - Heating	+25°C to +200°C = < 10 minutes -10°C to +25°C = < 2 minutes
Transition time - Cooling	+25°C to -10°C = < 7 minutes +200°C to +25°C = < 8 minutes
Temperature uniformity	< ± 0.5K @ -30°C to +100°C < ± 0.5 % @ +100°C to +400°C
Flatness/ Paralellism	< ± 8 µm
Isolation	> 2 TΩ @ 25°C
Capacitance	1,000 pF (standard), 100 pF (triaxial)
Interface	RS232 (standard), IEEE488 (option)
Chuck dimensions	Diameter: 205 mm Height: 28 mm Weight: 2,750 g
Controller dimensions	250 mm x 480 mm x 120 mm

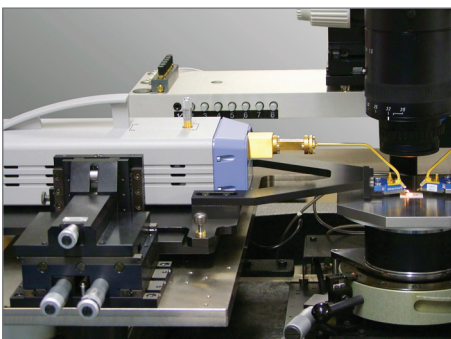
## FACILITY REQUIREMENTS

Power	100 - 240 VAC, 47 - 63 Hz, 1 A maximum, 24 W typical (without thermal chuck)
Vacuum	-0.8 bar
Compressed air	4 bar

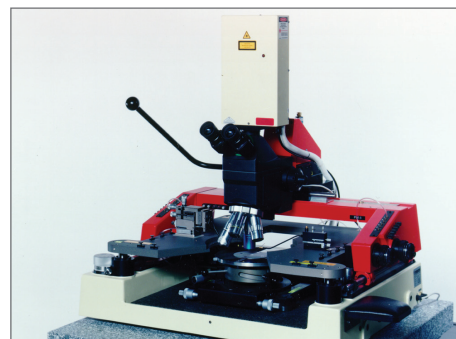
## APPLICATIONS



MEMS testing on PM8 with pressure chuck.



Sub-THz measurements with the Infinity Probes®



Failure analysis with an optional laser cutter.

## ORDERING INFORMATION

### Complete RF Package

PART NUMBER	DESCRIPTION
EPS200RF	SMART 200 mm RF manual station package for applications up to 67 GHz
EPS-ACC-200RF-4P	4-port option for EPS200RF package including two RPP305 positioners and two N/S RF arms
EPS-ACC-TV	Analog TV option for EPS packages containing C-mount

### PM8-Based Preconfigured Systems

PART NUMBER	DESCRIPTION
PM8-COAX-ST-PCKG	Preconfigured base system for coaxial setups with stereo microscope
PM8-COAX-HR-PCKG	Preconfigured base system for coaxial setups with high-resolution microscope
PM8-FA-PCKG	Preconfigured base system for failure analysis application

## REGULATORY COMPLIANCE

Certification	CE
Power supply certification	CE, UL, PSE

## WARRANTY

Warranty*	Fifteen months from date of delivery or twelve months from date of installation
Service contracts	Single and multi-year programs available to suit your needs

\*See Cascade Microtech's Terms and Conditions of Sale for more details.

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