

PMC200

200 mm Manual Cryogenic Probe System



DATA SHEET

The PMC200 is the ideal solution for testing wafers and substrates up to 200 mm in a cryogenic environment. Specially designed for laboratory requirements, it supports a wide range of measurements, including I-V, C-V and RF, and can be used for probing down to 77 K with liquid nitrogen or 4 K with liquid helium. Application flexibility is ensured for DC and RF measurements of the latest silicon, compound semiconductor and superconductor devices.

The base of the PMC200 is a vibration isolated mainframe. The chuck and the chuck stage with 200 mm x 200 mm X-Y travel, theta and separation stroke are located inside the high-vacuum chamber that contains flanges for vacuum-tight mechanical feedthrough drives. Thus the chuck and up to eight vacuum-type positioners can be easily operated from outside of the chamber via cardan shaft. Different exchangeable window flanges are available for different working distances between the microscope objective and the wafer. The high-vacuum pump stand with turbo-molecular-pump (TMP) ensures ice- and condensation-free probing.

The probe platen is designed to mount probe cards or up to eight vacuum-type positioners on magnetic feet. To reduce heat entrance, probes are cooled by flexible copper braids connected with the cryo shield. A high-resolution video microscope with 50 mm x 50 mm travel range is mounted either on a microscope bridge for vibration-sensitive test instruments or on a remote controlled lift.

The PMC200 can be outfitted with a number of instruments. These include, among others, various video microscopes, laser cutters and optical topology measurement tools, or black bodies for exposure of the DUT with controlled IR radiation.

FEATURES / BENEFITS

Flexibility	Customized to meet users' requirements Different substrate carriers for wafers up to 200 mm or single dies Cooling sequence of chuck and shield controlled by cold valves Use of both, LN2 and LHe Wide range of measurements [I-V, C-V, RF] Accessories available, such as laser cutters and optical motion analysis tools
Stability	High accuracy, ideal for small structures Highly stable mechanics, stable vibration isolation table
Ease of use	Simple, straightforward design for easy and ergonomic operation Quick and ergonomic change of the DUT through front door
High measurement throughput	Independent control of chuck and positioners for fast step-and-repeat testing of the whole wafer

SPECIFICATIONS*

Wafer / Substrate Size	Up to 200 mm (round or square)
X, Y, Theta Chuck Stage	
Resolution	5 μm
X-Y travel	200 mm x 200 mm
Load stroke Y axis	100 mm
Z contact / separation stroke	5 mm
Theta travel (standard)	$\pm 3^\circ$
Positioners	
Type	Up to 8 vacuum type positioners with universal joints and probe cooling
Chuck	
Wafer chuck	100 mm, 150 mm or 200 mm
Universal chuck	Small dies, wafer fragments, 1", 2", 3" Wafers
Temperature range LN2	75 K to 400 K
Temperature range LHe	4 K to 400 K
Temperature extensions	Up to 675 K
High-Vacuum Pumping System	
Maximum vacuum	10^{-5} mbar
Pump types	Diaphragm and turbo-molecular drag pumps
Vacuum gauge	Full range Pirani/cold-cathode
Manual Microscope Support (Swivel Mechanism / Linear Bridge)	
Travel range	50 mm x 50 mm
Z travel	Large motorized Z stroke or 50 mm manual focus drive and pneumatic lift-off
View Port	
Diameter	60 mm
Material	Quartz glass (others on request)
Working distance	30 mm, 50 mm or 80 mm
Microscope	
Type	Video zoom microscope (optional: FS70 or custom instruments)
Zoom range	12x
Magnification	1.16x - 14x
Resolution	9 μm - 2 μm

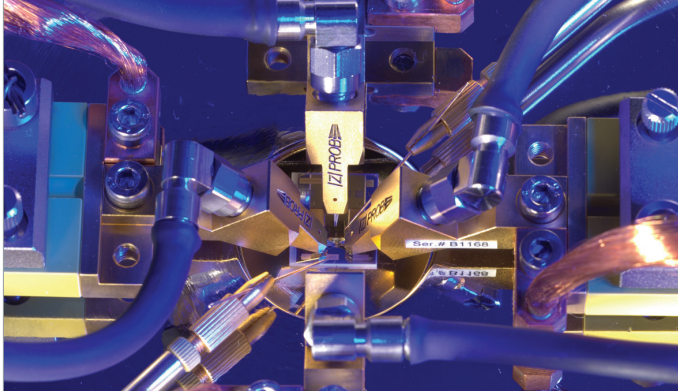
** Data, design and specification depend on individual process conditions and can vary according to equipment configurations.
Not all specifications may be valid simultaneously.*

PHYSICAL DIMENSIONS

Weight	750 kg
Dimensions	1100 mm x 1500 mm x 2000 mm

APPLICATIONS

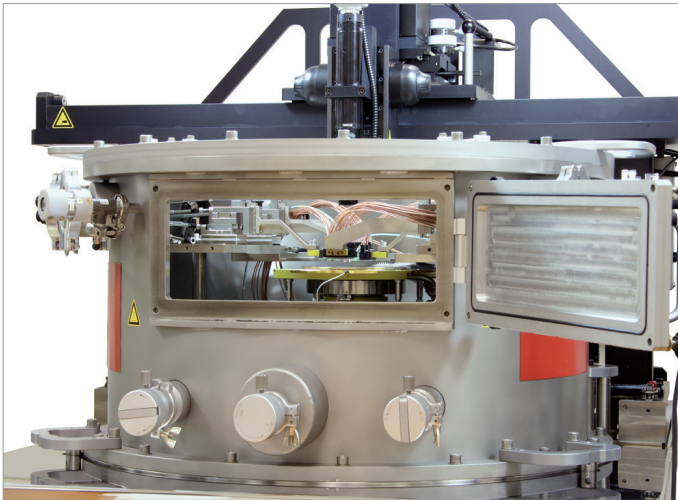
Advanced silicon technology
Compound semiconductor devices
Superconductors



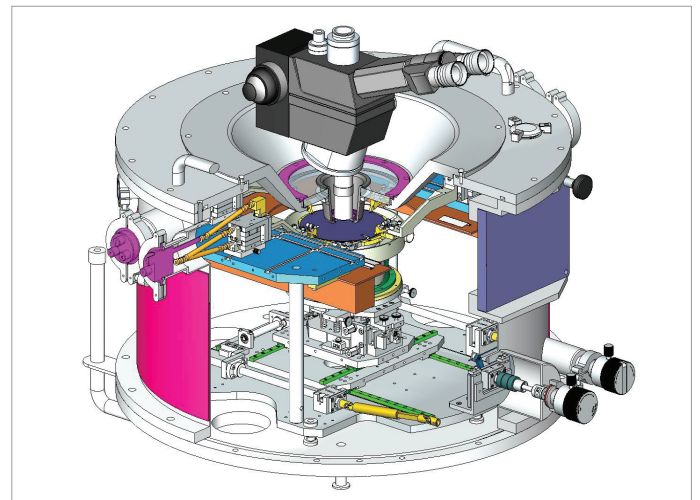
Test of a wafer with six positioners (four RF, two DC).

HANDLING

All knobs located outside of the chamber ensure easy and precision control of the chuck stage and positioners. The hinged front door allows quick and ergonomic loading and unloading of your DUT. The chamber lid enables easy probe configuration and probe tip exchange.



The large front door allows quick and ergonomic loading and unloading of your DUT. The chuck and up to eight vacuum-type positioners can be easily operated from outside via universal joint drivers.



Principle of manual chamber.

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