MPI TS200 | 200 mm Manual Probe System

For accurate and reliable DC/CV, RF and High Power measurements

FEATURES / BENEFITS

Universal Use

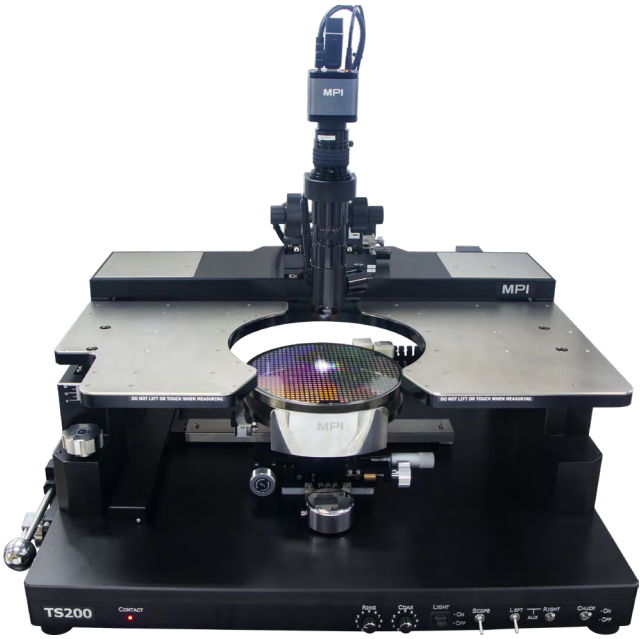
- Designed for wide variety of applications such as RF and mmW, Device Characterization, Wafer Level Reliability, High Power, Failure Analysis, IC Engineering and MEMS

Ergonomic Design

- Unique puck controlled air bearing stage for quick single-handed operation
- Rigid platen accommodates up to 10 DC or 4 RF positioners
- Highly repeatable platen lift design with three discrete positions for contact, separation, and loading

Upgradability

- Available with various chuck options and wide range of accessories such as DC/RF/mmW MicroPositioners, microscopes and EMI shielded DarkBox to support various application requirements



SPECIFICATIONS

Chuck XY Stage (Standard)

Total travel range	240 x 315 mm (9.4 x 12.4 in)
Fine-travel range	25 x 25 mm fine micrometer control
Fine-travel resolution	< 1.0 µm (0.04 mils) @ 500 µm/rev
Planarity	< 10 µm
Theta travel (standard)	360°
Theta travel (fine)	± 5.0°
Theta resolution	7.5 x 10^{-3} gradient
Movement	Puck controlled air bearing stage

Manual Microscope Stage (Air Bearing)

Movement range	25 x 25 mm (1 x 1 in)
Resolution	N/A
Scope lift	Manual, tilt-back
Movement	Air bearing control, fixed by vacuum

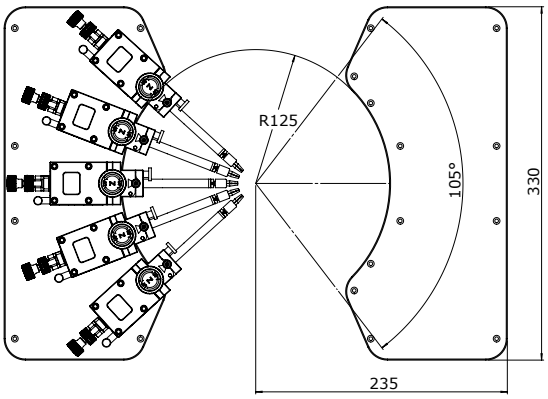
Manual Microscope Stage (Linear)

Movement range	50 x 50 mm (2 x 2 in) or 80 x 80 mm (3.15 x 3.15 in)
Resolution	< 5 µm (0.2 mils)
Scope lift	Manual, tilt-back or vertical (depending on microscope type)
Movement	Independently controlled X and Y movement with locking screws

PROBE PLATEN

Specifications

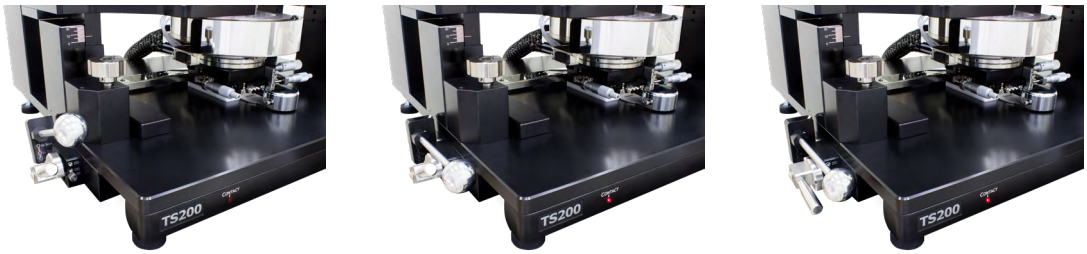
Material	Nickel plated steel
Dimension	See drawing
Chuck top to platen top	Min. 28 mm
Max. No of MicroPositioners	10 DC or 4 RF
Platen lift control	3 positions - contact (0), separation (300 µm), and loading (3 mm)
Z-height movement range	20 mm (0.8 in)
Separation repeatability	< 1 µm (0.04 mils) by „automated“ control
RF MicroPositioner mounting	Magnetic with guided rail
DC MicroPositioner mounting	Magnetic
300 °C thermal isolation	Depending on chuck configuration

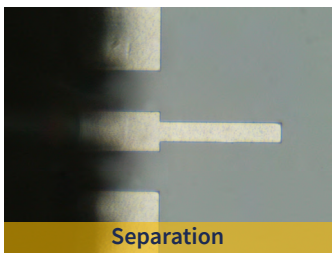


Universal probe platen design for up to 10 DC MicroPositioners

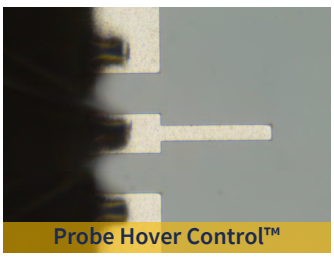
Platen Lift with Probe Hover Control™

MPI Probe Hover Control™ comes with hover heights (50, 100 or 150 µm) for easy and convenient probe to pad alignment.

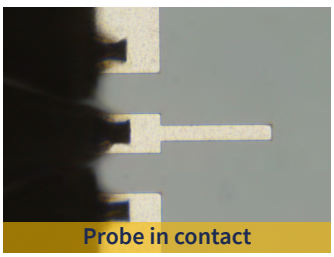




Separation



Probe Hover Control™



Probe in contact

NON-THERMAL CHUCKS

Standard Wafer Chuck

Connectivity	Coax BNC (f)
Diameter	210 mm
Material	Stainless steel
Chuck surface	Planar with centric engraved vacuum grooves
Vacuum grooves sections (diameter)	3, 27, 45, 69, 93, 117, 141, 164, 194 mm
Vacuum actuation	Multizone control - All connected in meander shape, center hole in 3 mm diameter
Supported DUT sizes	Single DUTs down to 5x5 mm size or wafers 50 mm (2 in) thru 200 mm (8 in)*
Surface planarity	≤± 5 µm
Rigidity	< 15 µm / 10 N @edge

**Single DUT testing requires higher vacuum conditions dependent upon testing application.*

RF Wafer Chuck

Connectivity	Kelvin Triax (f)
Diameter	210 mm with 2 integrated AUX areas
Material	Nickel plated aluminum (flat with 0.5 mm holes)
Chuck surface	Planar with 0.5 mm diameter holes in centric sections
Vacuum holes sections (diameter)	3, 27, 45, 69, 93, 117, 141, 164, 194 mm
Vacuum actuation	Manual switch between Center (4 holes), 100, 150, 200 mm (4, 6, 8 in)
Supported DUT sizes	Single DUTs down to 5x5 mm size or wafers 100 mm (4 in) thru 200 mm (8 in)*
Surface planarity	≤± 5 µm
Rigidity	< 15 µm / 10 N @edge

**Single DUT testing requires higher vacuum conditions dependent upon testing application.*

High Power Wafer Chucks

Connectivity 1	10 kV Coaxial (Banana or SHV)
Connectivity 2	Kelvin Triax (f), 3 kV or 10 kV Coaxial
Diameter	210 mm with 2 integrated AUX areas
Material	Gold plated aluminum (flat with 100 µm holes)
Chuck surface	Planar with 0.5 mm diameter holes in centric sections
Vacuum holes sections (diameter)	3, 27, 45, 69, 93, 117, 141, 164, 194 mm
Vacuum actuation	Manual switch between Center (4 holes), 100, 150, 200 mm (4, 6, 8 in)
Supported DUT sizes	Single DUTs down to 5x5 mm size or wafers 100 mm (4 in) thru 200 mm (8 in)*
Surface planarity	≤± 5 µm
Rigidity	< 15 µm / 10 N @edge

**Single DUT testing requires higher vacuum conditions dependent upon testing application.*

Auxiliary Chuck

Quantity	2 AUX chucks
Position	Integrated to front side of main chuck
Substrate size (W x L)	Max. 25 x 25 mm (1 x 1 in)
Material	Ceramic, RF absorbing material for accurate calibration
Surface planarity	≤± 5 µm
Vacuum control	Controlled independently, separate from chucks

Electrical Specification (Coax)

Operation voltage	In accordance with EC 61010, certificates for higher voltages available upon request
Maximum voltage between chuck top and GND	500 V DC
Isolation	> 2 GΩ

Electrical Specification (Triax)

	Standard Chuck (10 V)	High Power Chuck (10 V)
Chuck isolation	> 100 GΩ	> 30 TΩ
Force to guard	> 100 GΩ	> 30 TΩ
Guard to shield	> 10 GΩ	> 500 GΩ
Force to shield	> 50 GΩ	> 100 GΩ

THERMAL CHUCKS

Specifications of MPI ERS AirCool® Technology

	Ambient to 150 °C	20 °C to 150 °C	Ambient to 200 °C	20 °C to 200 °C
Connectivity	Coax BNC (f)	Coax BNC (f)	Coax BNC (f)	Coax BNC (f)
Temperature control method	Cooling air / Resistance heater	Cooling air / Resistance heater	Cooling air / Resistance heater	Cooling air / Resistance heater
Coolant	Air (user supplied)	Air (user supplied)	Air (user supplied)	Air (user supplied)
Smallest temperature selection step	0.1 °C	0.1 °C	0.1 °C	0.1 °C
Chuck temperature display resolution	0.1 °C	0.1 °C	0.1 °C	0.1 °C
External touchscreen display operation	N/A	N/A	N/A	N/A
Temperature stability	±0.5 °C	±0.5 °C	±0.5 °C	±0.5 °C
Temperature accuracy	±1 °C	±1 °C	±1 °C	±1 °C
Control method	DC/PID	DC/PID	DC/PID	DC/PID
Chuck pinhole surface plating: 200 °C	Nickel	Nickel	Nickel	Nickel
Vacuum distribution	In center for 5x5 mm (4 holes) 100, 150, 200 mm (4, 6, 8 in)			
Temperature sensor	Pt100 1/3DIN	Pt100 1/3DIN	Pt100 1/3DIN	Pt100 1/3DIN
Temperature uniformity	< ±1 °C	< ±1 °C	< ±1 °C	< ±1 °C
Surface flatness and base parallelism	< ±15 µm	< ±15 µm	< ±15 µm	< ±15 µm
Max. Voltage between Force-to-GND	500 V DC	500 V DC	500 V DC	500 V DC
Heating rates	35 to 150 °C < 10 min	20 to 150 °C < 12 min	35 to 200 °C < 13 min	20 to 200 °C < 15 min
Cooling rates*	150 to 35 °C < 15 min	150 to 20 °C < 18 min	200 to 35 °C < 18 min	200 to 20 °C < 20 min
Leakage @ 10 V	N/A	N/A	N/A	N/A
Electrical isolation	> 0.5 T Ω at 25 °C	> 0.5 T Ω at 25 °C	> 0.5 T Ω at 25 °C	> 0.5 T Ω at 25 °C
Capacitance	< 750 pF	< 750 pF	< 750 pF	< 750 pF

**All data are relevant for chucks in ECO mode.*

HIGH POWER THERMAL CHUCKS

Specifications of MPI ERS Integrated Technology

	20 °C to 200 °C	20 °C to 300 °C
Connectivity	Kelvin Triax (f), 3 kV or 10 kV Coaxial	Kelvin Triax (f), 3 kV or 10 kV Coaxial
Temperature control method	Cooling air / Resistance heater	Cooling air / Resistance heater
Coolant	Air (user supplied)	Air (user supplied)
Smallest temperature selection step	0.1 °C	0.1 °C
Chuck temperature display resolution	0.01 °C	0.01 °C
External touchscreen display operation	Yes	Yes
Temperature stability	±0.08 °C	±0.08 °C
Temperature accuracy	0.1 °C	0.1 °C
Control method	Low noise DC/PID	Low noise DC/PID
Interfaces	RS232C	RS232C
Chuck surface plating	Gold plated with pinhole surface	Gold plated with pinhole surface
Temperature sensor	Pt100 1/3DIN, 4-line wired	Pt100 1/3DIN, 4-line wired
Temperature uniformity	< ± 0.5°C	< ±0.5°C at ≤ 200°C < ±1.0°C at > 200°C
Surface flatness and base parallelism	< ±10 µm at ≤ 200 °C	< ±10 µm at ≤ 200 °C < ±15 µm at > 200 °C
Heating and Cooling Rates*	20 to 200 °C < 30 min 200 to 20 °C < 30 min	20 to 300 °C < 40 min 300 to 20 °C < 40 min
Leakage @ 10 V Kelvin Triax (f)		
25°C	< 15 fA	< 15 fA
200°C	< 30 fA	< 30 fA
300°C	--	< 50 fA
Leakage @ 3000 V Kelvin Triax (f)		
25°C	< 5 pA	< 5 pA
200°C	< 10 pA	< 10 pA
300°C	--	< 15 pA
Leakage @ 10 kV Coax UHV/SHV (f)		
25°C	< 6 nA	< 6 nA
200°C	< 6 nA	< 6 nA
300°C	--	< 6 nA
Maximum voltage between chuck top and GND	10 kV DC	10 kV DC

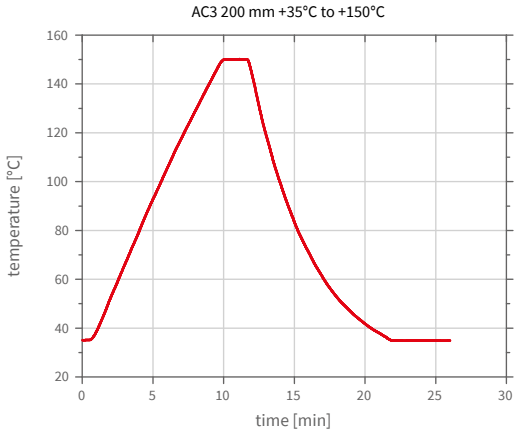
**All data are relevant for chucks in ECO mode.*

Thermal Controller Dimensions / Power and Air Consumption

System type	W x D x H (mm)	Weight (kg)	Power cons. (VA)	max. Air flow*(l/min)
35 to 150 °C	300 x 260 x 135	7	600	200
20 to 200 °C	300 x 360 x 135	12	1000	200
20 to 300 °C	300 x 360 x 135	12	1000	200

**All data are relevant for chucks in ECO mode.*

TYPICAL TRANSITION TIME



FACILITY REQUIREMENTS

Thermal Chuck Electrical Supply

Electrical Supply	Hot only thermal chucks
Electrical primary connection	100 to 240 VAC auto switch
Electrical frequency	50 Hz / 60 Hz
Compressed Air Supply	
Operating pressure	6.0 bar (0.6 MPa, 87 psi) at specified flow rate
CDA dew point	≤ 0 °C

General Probe System

Power	100-240 V AC nominal; 50/60 Hz for optical accessories* only
Vacuum	-0.5 bar (for single DUT) / -0.3 bar (for wafers)
Compressed air	6.0 bar

**e.g. microscope illumination, CCD cameras, monitors.*

REGULATORY COMPLIANCE

- CE certified. TÜV compliance tested according to EN 61010 and ISO 12100

WARRANTY

- Warranty*: 12 months
- Extended service contract: contact MPI Corporation for more information

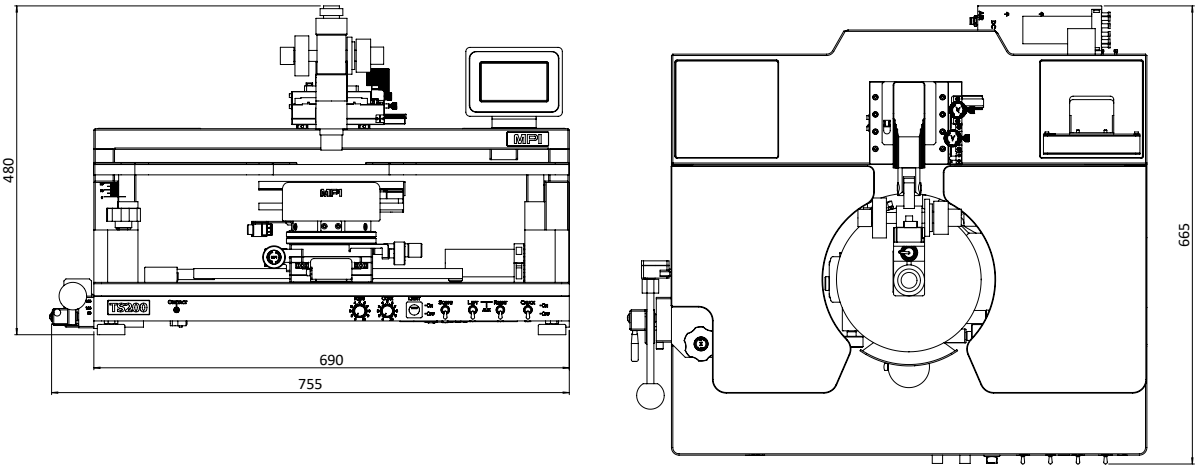
**See MPI Corporation's Terms and Conditions of Sale for more details.*

PHYSICAL DIMENSIONS

TS200

Dimensions* (W x D x H)	690 x 665 x 480 mm (27.2 x 26.2 x 18.9 in)
Weight	~88 kg (194 lb.)

**Station accessories, such as different microscopes, cameras, or laser cutters, may change the total height.*



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