

# MPI TS300 | 300 mm Manual Probe System

## For accurate and reliable DC/CV and RF measurements

### FEATURES / BENEFITS

#### Universal Use

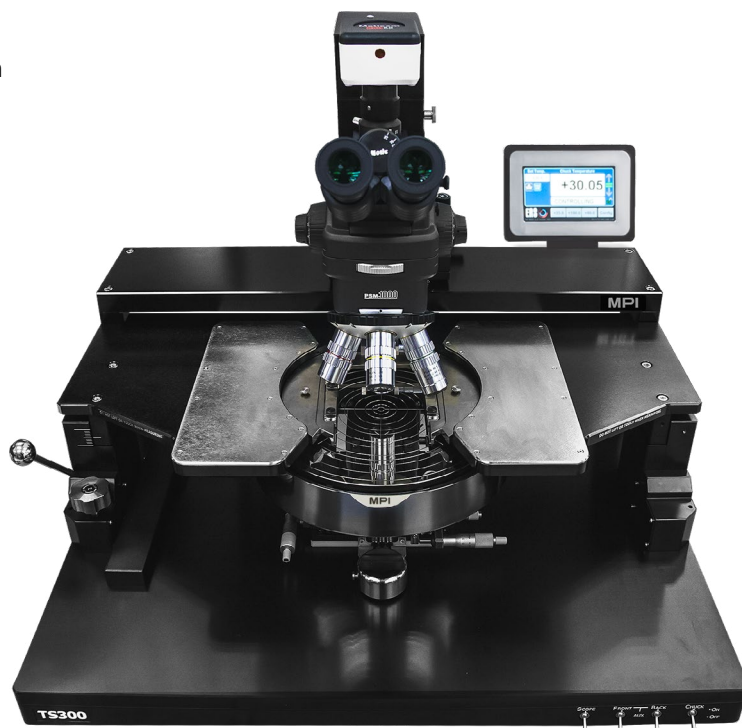
- Designed for wide variety of applications such as Device Characterization and Modeling, Wafer Level Reliability, Failure Analysis, IC Engineering and MEMS

#### 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, Optics, microscopes and EMI shielded dark box to support various application requirements



### SPECIFICATIONS

#### Chuck XY Stage (Standard)

Total travel range	330 x 420 mm (13.0 x 16.5 in)
Fine-travel range	25 x 25 mm fine micrometer control
Fine-travel resolution	< 1.0 $\mu\text{m}$ (0.04 mils) @ 500 $\mu\text{m}/\text{rev}$
Planarity	< 10 $\mu\text{m}$
Theta travel (standard)	360°
Theta travel (fine)	$\pm 5.0^\circ$
Theta resolution	$7.5 \times 10^{-3}$ 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

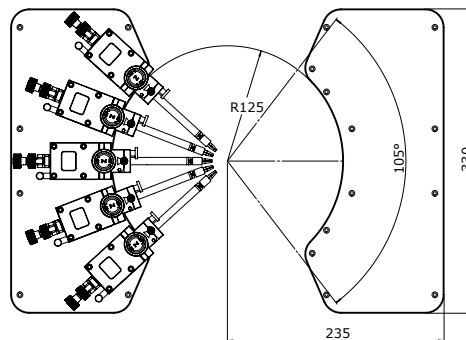
**Manual Microscope Stage (Linear)**

Movement range	50 x 50 mm (2 x 2 in) or 80 x 80 mm (3.15 x 3.15 in)
Resolution	< 5µm (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**

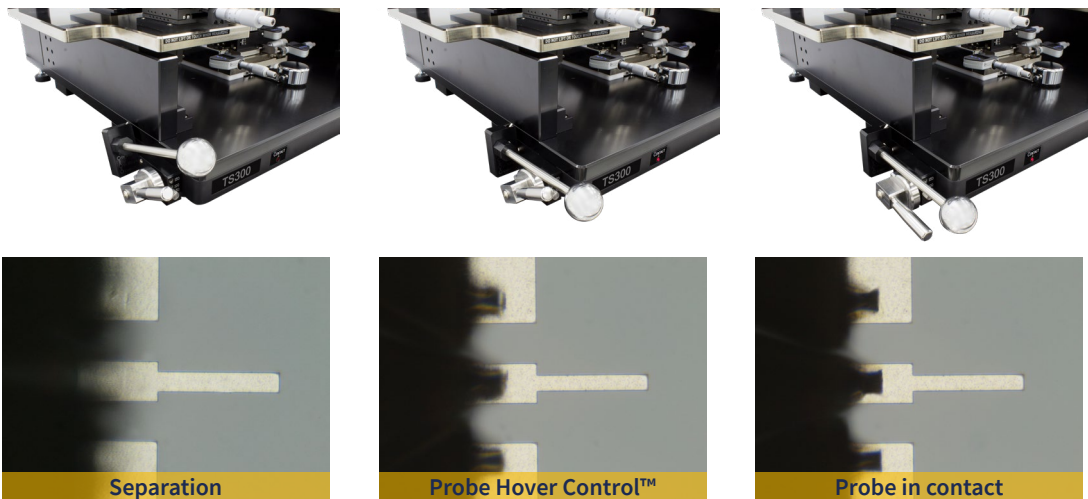
Material	Nickel plated steel
Dimension	See drawing
Chuck to platen height	Min. 10 mm
Max. No of MicroPositioners	10 DC or 4 RF
Platen lift control	3 positions - contact (0), separation (300 µm), and loading (3 mm)
Platen Z-height movement	Micrometer adjustment for fine control
Z-height adjustment range	Max. 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.



## NON-THERMAL CHUCKS

### Standard Wafer Chuck

Connectivity	Coax BNC (f)
Diameter	310 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, 214, 254, 294 mm
Vacuum actuation	Multizone control - All connected in meander shape, center hole in 3 mm diameter
Supported DUT sizes	Single DUTs down to 4 x 4 mm size or wafers 50 mm (2 in) thru 300 mm (12 in)*
Surface planarity	$\leq \pm 5 \mu\text{m}$
Rigidity	$< 15 \mu\text{m} / 10 \text{ N @edge}$

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

### RF Wafer Chuck

Connectivity	Coax BNC (f)
Diameter	310 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, 214, 254, 294 mm
Vacuum actuation	Manual switch between Center (4 holes), 150, 200, 300 mm (6, 8, 12 in)
Supported DUT sizes	Single DUTs down to 4 x 4 mm size or wafers 150 mm (6 in) thru 300 mm (12 in)*
Surface planarity	$\leq \pm 5 \mu\text{m}$
Rigidity	$< 15 \mu\text{m} / 10 \text{ N @edge}$

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

### Auxiliary Chuck

Quantity	2 AUX chucks
Position	Integrated to rear 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	$\leq \pm 5 \mu\text{m}$
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	$> 2 \text{ G}\Omega$

## THERMAL CHUCKS

### Specifications of MPI ERS AirCool® PRIME Technology

	Ambient to 200/300 °C	20 °C to 200/300 °C	Ambient to 200/300 °C	20 °C to 200/300 °C
Chuck type	RF	RF	Ultra low noise	Ultra low noise
Connectivity	Kelvin Triax (f)	Kelvin Triax (f)	Kelvin Triax (f)	Kelvin Triax (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	0.01 °C	0.01 °C	0.01 °C	0.01 °C
External touchscreen display operation	Yes	Yes	Yes	Yes
Temperature stability	±0.5 °C	±0.05 °C	±0.05 °C	±0.05 °C
Temperature accuracy	±0.1 °C	±0.1 °C	±0.1 °C	±0.1 °C
Control method	Low noise DC/PID	Low noise DC/PID	Low noise DC/PID	Low noise DC/PID
Chuck pinhole surface plating: 200°C / 300°C	Nickel / Gold	Nickel / Gold	Nickel / Gold	Nickel / Gold
SmartVacuum™ distribution	In front for single DUT 4x4 mm (4 holes) and 75 mm (3 in) In center for 150, 200, 300 mm (6, 8, 12 in)			
Temperature sensor	Pt100 1/3DIN, 4-line wired	Pt100 1/3DIN, 4-line wired	Pt100 1/3DIN, 4-line wired	Pt100 1/3DIN, 4-line wired
Temperature uniformity	< ±0.5 °C at ≤ 200 °C < ±1 °C at > 200 °C	< ±0.5 °C at ≤ 200 °C < ±1 °C at > 200 °C	< ±0.5 °C at ≤ 200 °C < ±1 °C at > 200 °C	< ±0.5 °C at ≤ 200 °C < ±1 °C at > 200 °C
Surface flatness and base parallelism	< ±12 μm	< ±12 μm	< ±12 μm	< ±12 μm
Max. Voltage between				
Force-to-GND	600 V DC	600 V DC	600 V DC	600 V DC
Force-to-Guard	100 V DC	100 V DC	600 V DC	600 V DC
Heating rates	35 to 200 °C < 15 min 35 to 300 °C < 25 min	20 to 200 °C < 18 min 20 to 300 °C < 28 min	35 to 200 °C < 18 min 35 to 300 °C < 28 min	20 to 200 °C < 20 min 20 to 300 °C < 30 min
Cooling rates*	200 to 35 °C < 28 min 300 to 35 °C < 35 min	200 to 20 °C < 30 min 300 to 20 °C < 38 min	200 to 35 °C < 30 min 300 to 35 °C < 38 min	200 to 20 °C < 33 min 300 to 20 °C < 40 min
Leakage @ 10 V	N/A	N/A	< 15 fA at 25 °C < 30 fA at 200 °C < 50 fA at 300 °C	< 15 fA at 25 °C < 30 fA at 200 °C < 50 fA at 300 °C
Electrical isolation	> 5 T Ω at 25 °C > 1 T Ω at 200 °C > 0.5 T Ω at 300 °C	> 5 T Ω at 25 °C > 1 T Ω at 200 °C > 0.5 T Ω at 300 °C	N/A	N/A
Capacitance				
Force-to-Guard	< 1600 pF	< 1600 pF	< 600 pF	< 600 pF
Guard-to-Shield	< 2000 pF	< 2000 pF	< 2000 pF	< 2000 pF

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



ERS and MPI's joint product AirCool® PRIME Chuck won "Electronics Industry Awards 2018" in the category, "Test, Measurement and Inspection Product of the year".

## FACILITY REQUIREMENTS

### Thermal Chuck Electrical Supply

<b>Electrical Supply</b>	Hot only thermal chucks
Electrical primary connection	100 to 240 VAC auto switch
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

### Controller Dimensions / Power and Air Consumption

System Type	W x D x H (mm)	Weight (kg)	Power Cons. (VA)	max. Air Flow (l/min)
35/20 to 200 °C	300 x 360 x 135	12	1200	400
35/20 to 300 °C	300 x 360 x 135	12	1200	400

### 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

- Certification: CE
- Power Supplies: CE, NRTL certified

## WARRANTY

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

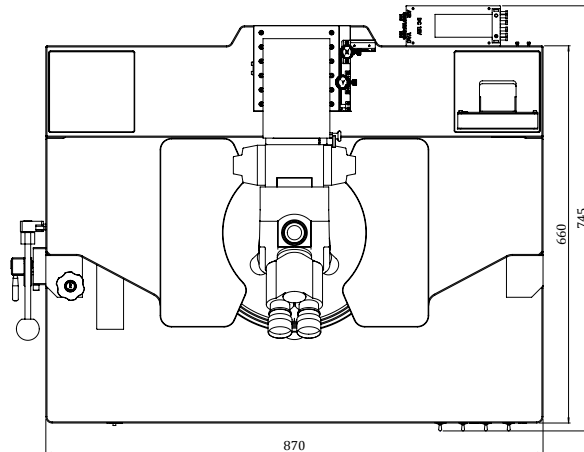
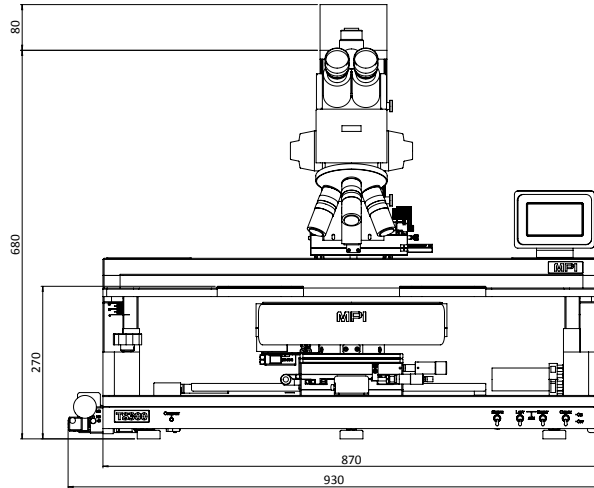
\*See MPI Corporation's Terms and Conditions of Sale for more details.

**PHYSICAL DIMENSIONS**

**Station Platform with Bridge\***

Dimensions (W x D x H)	870 x 660 x 680 mm (34.3 x 26.0 x 26.8 in)
Weight	~95 kg (210 lb.)

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



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**MPI Global Presence**

