

MPI TS300-SE |

300 mm Manual Probe System with ShieldEnvironment™

For Accurate and Reliable DC/CV, RF, mmW and High Power Measurements

FEATURES / BENEFITS

Universal Use

- Designed for wide variety of applications such as Device Characterization and Modeling, RF and mmW Wafer Level Reliability, and Failure Analysis
- High power measurement option

MPI ShieldEnvironment™ for Accurate Measurements

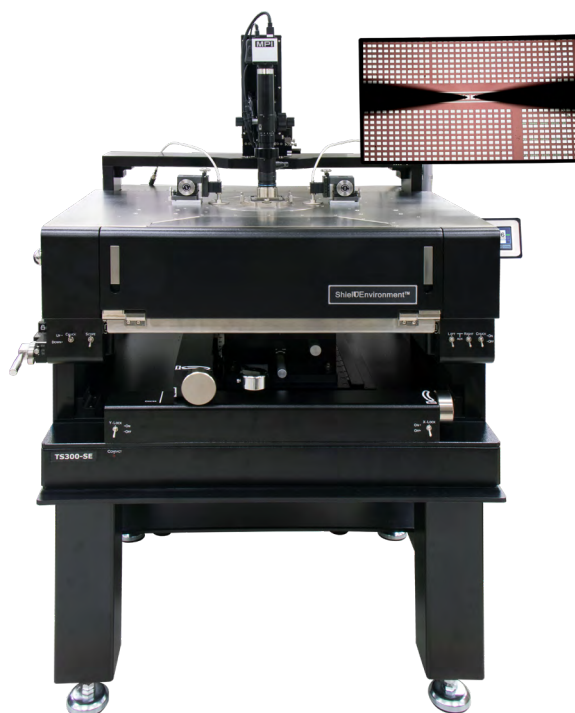
- Design for Advanced EMI / RFI / Light-Tight Shielding
- FemtoAmp low-leakage capabilities
- Integrated active vibration isolation
- Ready for temperature range -60 °C to 300 °C

Ergonomic Design and Options

- Unique puck controlled air bearing stage for quick single-handed operation
- Available with various chuck options and wide range of accessories such as DC/RF/mmW MicroPositioners, microscopes and ShieldEnvironment™ provide excellent support for various application requirements

Light Curtain Option

- Safety design converting the probe station into an TS300-HP



SPECIFICATIONS

Chuck XY Stage (Standard)

Fast and fine travel range	325 x 325 mm (12.8 x 12.8 in)
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
MPI Safe Contact	XY stage is locked, as soon in contact, with LED indication

Chuck Z Stage

Travel range	5 mm (0.2 in)
Fine-travel resolution	< 1.0 μm (0.04 mils) @ 500 μm/rev
Load stroke	20 mm, pneumatically

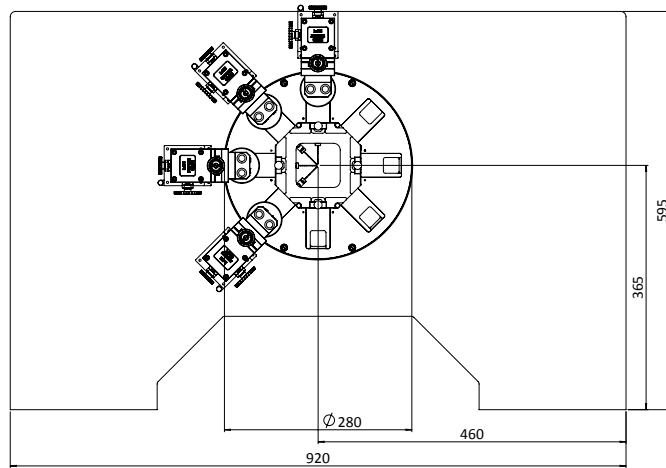
Manual Microscope Stage (Linear)

Movement range	50 x 50 mm (2 x 2 in)
Resolution	< 5 μm (0.2 mils)
Scope lift	140 mm vertical, pneumatic control
Movement	Independently controlled X and Y movement with locking screws

PROBE PLATEN

Specifications

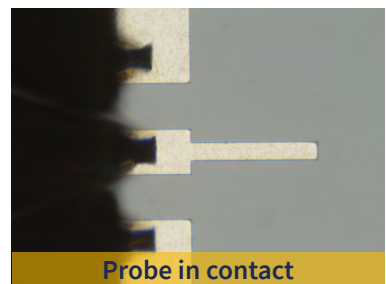
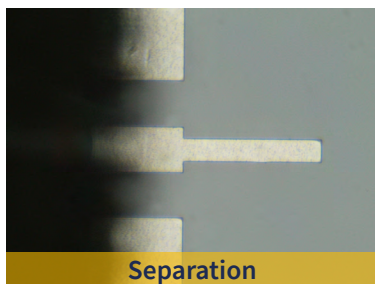
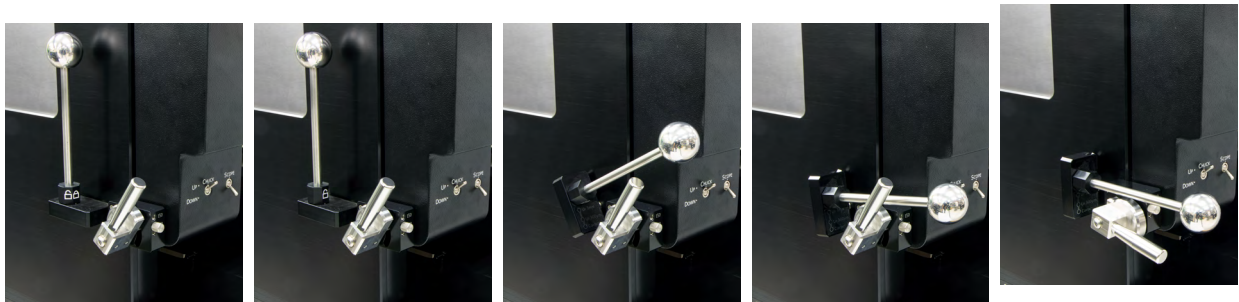
Material	Nickel plated steel
Dimension	See drawing
Chuck to ShieldGuard height	Min. 5 mm
Max. No of MicroPositioners	8x DC MicroPositioners or 4x DC + 4x RF MicroPositioner Setup
Platen lift control	3 positions - contact (0), separation (300 μm), and loading (3 mm)
MPI Probe Hover Control (PHC™)	Additional hover height (50, 100 or 150 μm) for easy probe to pad alignment
Contact repeatability	< 1 μm (0.04 mils) by “automated” control
RF MicroPositioner mounting	Magnetic with guided rail
MicroPositioner mounting	Magnetic
300 °C thermal isolation	Depending on chuck configuration



Universal probe platen design for up to 8 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.



ShieldEnvironment™

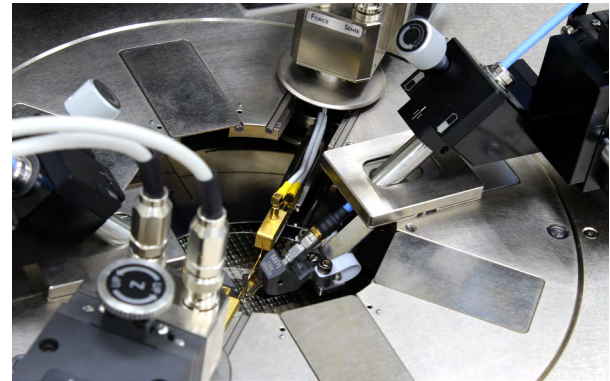
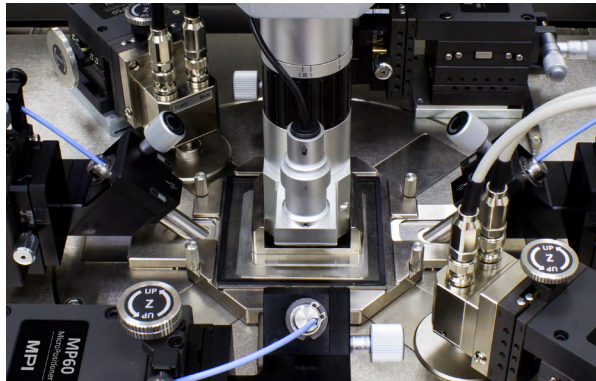
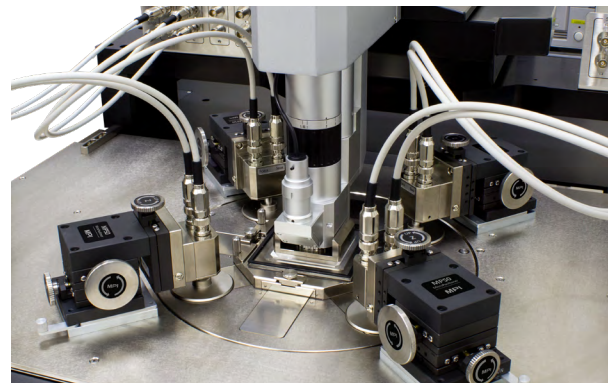
MPI ShieldEnvironment™ is a high performance local environmental chamber providing excellent EMI- and light-tight shielded test environment for ultra-low noise, low capacitance measurements.

MPI ShieldEnvironment™ allows up to 4-port RF or up to 8-ports DC/Kelvin or a combination of those configurations. MPI ShieldCap™ provides easy reconfiguration of measurement setup as well as EMI/noise shielding - which make great difference in simplifying day to day operations.

ShieldEnvironment™ Electrical Specifications*

EMI shielding	> 30 dB (typical) @ 1 kHz to 1 MHz
Light attenuation	≥ 130 dB
Spectral noise floor	≤ -180 dBVrms/rtHz (≤ 1 MHz)
System AC noise	≤ 5 mVp-p (≤ 1 GHz)

*Including 4 MicroPositioners.



TYPICAL CONFIGURATION WITH MPI KELVIN AND MPI KELVIN-HIGH TEMPERATURE PROBES INSIDE SHIELD ENVIRONMENT™

	Coax Probe	Triax Probe	Kelvin Probe	Kelvin HT Probe
Max voltage	500 V	500 V	500 V	500 V
Temperature range	-60 °C to 300 °C	-60 °C to 300 °C	-60 °C to 200 °C	-60 °C to 200 / 300 °C
Leakage current	< 0.8 pA	< ± 20fA	< ± 10fA	< ± 10fA / < ± 20fA
Connectivity	SMB / BNC	Standard Triax	Kelvin Triax	Kelvin Triax
Connectivity type	Single, Coaxial	Single, low noise Triaxial	Force / Sense, low noise Triaxial	
Characteristics impedance	50 Ohms	50 Ohms	50 Ohms	50 Ohms
Residual capacitance	< 95 fF	< 95 fF	< 95 fF	< 95 fF
Probe holder material	Au-plated Brass		Au-plated Bras (Guarded)	
Probe tip type	Variety of metal tips		Coaxial / Guarded	Guarded ceramic blades
Probe tips material	W, BeCu, Au-plated		W	WRe
Probe tips radius	0.5 µm – 25 µm	0.5 µm – 25 µm	0.5 µm – 5 µm	2 µm – 5 µm
Minimum pad size	25 µm x 25 µm	25 µm x 25 µm	30 µm x 30 µm	25 µm x 25 µm



Typical MPI configuration with Kelvin Probes

TS300-IFE WITH IceFreeEnvironment™

As an alternative to the ShieDEnvironment™, MPI IceFreeEnvironment™ provides unique capability to perform measurements with probe cards and MicroPositioners simultaneously, especially at negative temperatures down to -60 °C.

Internal node probing with active/passive high impedance probes is very convenient.

The optimized design with minimal tip drop for highest dynamic range and gamma of mmWave and Load Pull measurements make the system an ideal choice for RF/mmW applications on 300 mm wafers.



NON-THERMAL CHUCKS

Standard 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 grooves sections (diameter)	4, 24, 48, 72, 96, 120, 144, 168, 192, 216, 240, 264, 288 mm
SmartVacuum™ distribution	In front for single DUT 5x5 mm (4 holes) and 75 mm (3 in) In center for 150, 200, 300 mm (6, 8, 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.

**By using SENTIO® topography

Triaxial Wafer Chuck

Connectivity	Kelvin Triax (f)
Diameter	310 mm
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)	4, 24, 48, 72, 96, 120, 144, 168, 192, 216, 240, 264, 288 mm
SmartVacuum™ distribution	In front for single DUT 5x5 mm (4 holes) and 75 mm (3 in) In center for 150, 200, 300 mm (6, 8, 12 in)
Surface planarity	$\leq \pm 5 \mu\text{m}^{**}$
Rigidity	$< 15 \mu\text{m} / 10 \text{ N @edge}$

**By using SENTIO® topography

Triaxial RF Wafer Chuck

Connectivity	Kelvin Triax (f)
Diameter	310 mm with 2 integrated AUX chucks
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)	4, 24, 48, 72, 96, 120, 144, 168, 192, 216, 240, 264, 288 mm
SmartVacuum™ distribution	In front for single DUT 5x5 mm (4 holes) and 75 mm (3 in) In center for 150, 200, 300 mm (6, 8, 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.

**By using SENTIO® topography

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	$\leq \pm 5 \mu\text{m}$
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 GΩ

Electrical Specification (Triax)

Chuck Isolation	At 10 V
Force-to-Guard	> 5 T Ohm
Guard-to-Shield	> 1 T Ohm
Force-to-Shield	> 5 T Ohm

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	±0.08 °C	±0.08 °C	±0.08 °C	±0.08 °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 5x5 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 < 16 min 35 to 300 °C < 29 min	20 to 200 °C < 19 min 20 to 300 °C < 30 min	35 to 200 °C < 17 min 35 to 300 °C < 33 min	20 to 200 °C < 21 min 20 to 300 °C < 34 min
Cooling rates*	200 to 35 °C < 24 min 300 to 35 °C < 27 min	200 to 20 °C < 35 min 300 to 20 °C < 42 min	200 to 35 °C < 27 min 300 to 35 °C < 31 min	200 to 20 °C < 37 min 300 to 20 °C < 50 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

*Typical data for all chucks based on FPS requirements.

Specifications of MPI ERS AirCool® PRIME with Fusion Chiller Technology

	-10 °C to 200/300 °C	-40 °C to 200/300 °C	-60 °C to 200/300 °C
Chuck type	RF	RF	RF
Connectivity	Kelvin Triax (f)	Kelvin Triax (f)	Kelvin Triax (f)
Temperature control method	Cooling air / Resistance heater	Cooling air / Resistance heater	Cooling air / Resistance heater
Coolant	Air (user supplied)	Air (user supplied)	Air (user supplied)
Smallest temperature selection step	0.1 °C	0.1 °C	0.1 °C
Chuck temperature display resolution	0.01 °C	0.01 °C	0.01 °C
External touchscreen display operation	Yes	Yes	Yes
Temperature stability	±0.08 °C	±0.08 °C	±0.08 °C
Temperature accuracy	0.1 °C	0.1 °C	0.1 °C
Control method	Low noise DC/PID	Low noise DC/PID	Low noise DC/PID
Interfaces	RS232C	RS232C	RS232C
Chuck pinhole surface plating: 200°C / 300°C	Nickel / Gold	Nickel / Gold	Nickel / Gold
SmartVacuum™ distribution	In front for single DUT 5x5 mm (4 holes) and 75 mm (3 in) In center for 150, 200 and 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
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
Surface flatness and base parallelism	< ±12 μm	< ±12 μm	< ±12 μm
Max. Voltage between			
Force-to-GND	600 V DC	600 V DC	600 V DC
Force-to-Guard	100 V DC	100 V DC	100 V DC
Heating rates*			
25 °C	-10 to 25 °C < 3 min	-40 to 25 °C < 5 min	-60 to 25 °C < 6 min
200 °C		25 to 200 °C < 16 min	
300 °C		25 to 300 °C < 28 min	
Cooling rates*			
AC3 Mode	300 °C	300 to 25 °C < 26 min	300 to 25 °C < 24 min
	200 °C	200 to 25 °C < 21 min	200 to 25 °C < 22 min
	25 °C	25 to -10 °C < 11 min	25 to -40 °C < 18 min
TURBO Mode	300 °C	300 to 25 °C < 26 min	300 to 25 °C < 23 min
	200 °C	200 to 25 °C < 21 min	200 to 25 °C < 21 min
	25 °C	25 to -10 °C < 11 min	25 to -40 °C < 16 min
Leakage @ 10 V	N/A	N/A	N/A
Electrical isolation		> 5 T Ω at 25 °C or below > 1 T Ω at 200 °C > 0.5 T Ω at 300 °C	
Capacitance			
Force-to-Guard	< 1600 pF	< 1600 pF	< 1600 pF
Guard-to-Shield	< 2000 pF	< 2000 pF	< 2000 pF

*Typical data for all chucks based on FPS requirements.

Specifications of MPI ERS AirCool® PRIME with Fusion Chiller Technology

	-10 °C to 200/300 °C	-40 °C to 200/300 °C	-60 °C to 200/300 °C
Chuck type	Ultra low noise	Ultra low noise	Ultra low noise
Connectivity	Kelvin Triax (f)	Kelvin Triax (f)	Kelvin Triax (f)
Temperature control method	Cooling air / Resistance heater	Cooling air / Resistance heater	Cooling air / Resistance heater
Coolant	Air (user supplied)	Air (user supplied)	Air (user supplied)
Smallest temperature selection step	0.1 °C	0.1 °C	0.1 °C
Chuck temperature display resolution	0.01 °C	0.01 °C	0.01 °C
External touchscreen display operation	Yes	Yes	Yes
Temperature stability	±0.08 °C	±0.08 °C	±0.08 °C
Temperature accuracy	0.1 °C	0.1 °C	0.1 °C
Control method	Low noise DC/PID	Low noise DC/PID	Low noise DC/PID
Interfaces	RS232C	RS232C	RS232C
Chuck pinhole surface plating: 200°C / 300°C	Nickel / Gold	Nickel / Gold	Nickel / Gold
SmartVacuum™ distribution	In front for single DUT 5x5 mm (4 holes) and 75 mm (3 in) In center for 150, 200 and 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
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
Surface flatness and base parallelism	< ±12 μm	< ±12 μm	< ±12 μm
Max. Voltage between			
Force-to-GND	600 V DC	600 V DC	600 V DC
Force-to-Guard	600 V DC	600 V DC	600 V DC
Heating rates*			
25 °C	-10 to 25 °C < 3 min	-40 to 25 °C < 5 min	-60 to 25 °C < 6 min
200 °C		25 to 200 °C < 18 min	
300 °C		25 to 300 °C < 31 min	
Cooling rates*			
AC3 Mode	300 °C	300 to 25 °C < 28 min	300 to 25 °C < 28 min
	200 °C	200 to 25 °C < 23 min	200 to 25 °C < 24 min
	25 °C	25 to -10 °C < 12 min	25 to -40 °C < 20 min 25 to -60 °C < 40 min
TURBO Mode	300 °C	300 to 25 °C < 28 min	300 to 25 °C < 27 min
	200 °C	200 to 25 °C < 23 min	200 to 25 °C < 23 min
	25 °C	25 to -10 °C < 12 min	25 to -40 °C < 18 min 25 to -60 °C < 37 min
Leakage @ 10 V			
-10, -40 or -60 °C	< 30 fA	< 30 fA	< 30 fA
25 °C	< 15 fA	< 15 fA	< 15 fA
200 °C	< 30 fA	< 30 fA	< 30 fA
300 °C	< 50 fA	< 50 fA	< 50 fA
Capacitance			
Force-to-Guard	< 600 pF	< 600 pF	< 600 pF
Guard-to-Shield	< 2000 pF	< 2000 pF	< 2000 pF

*Typical data for all chucks based on FPS requirements.

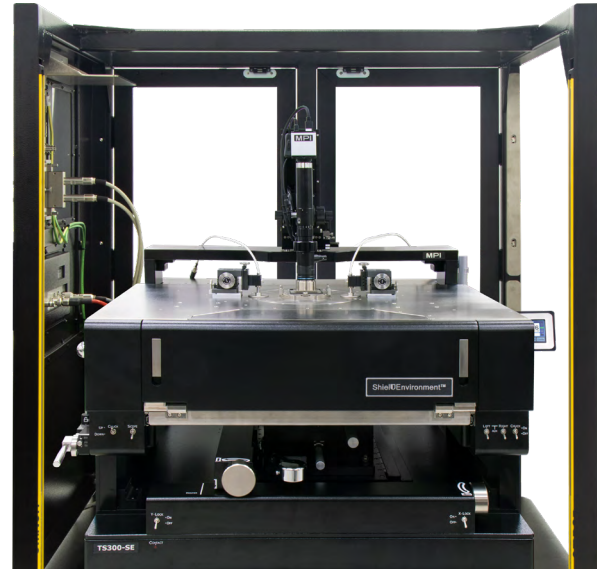
TS300-HP FOR HIGH POWER MEASUREMENTS

Dedicated designed for High Voltage and High Current application

- On wafer high power device measurement up to 10 kV/600 A
- Gold plated chuck surface for minimum contact resistance and vacuum holes optimized for thin wafer handling down to 50 μm
- Taiko wafer chuck option
- Dedicated high voltage and high current probes
- Anti-arcing solutions

Light Curtain

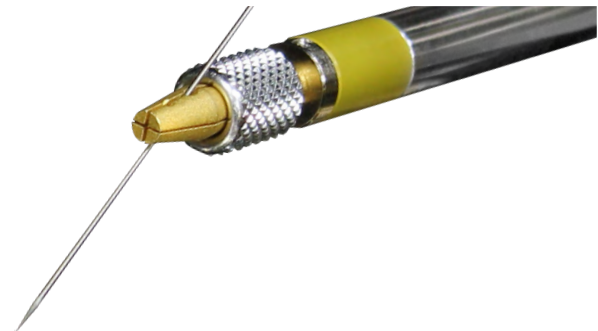
Light Curtain Interlock protects user from accidental high voltage shock by shutting down the instrument through interlock system. The interlock system at rear doors provides safety, easy and convenient initial measurement set-up.



HIGH POWER PROBES

High Voltage Probes (HVP)

Low leakage probes specially designed to withstand high voltage up to 10 kV (coaxial) and 3 kV (triaxial). Choice of various connectors options such as Keysight Triax/UHV, Keithley Triax/UHV, SHV or Banana.



High Current Probe (HCP)

High performance probes specially designed for on wafer measurement of high current up to 200 A (pulse). MPI multi-fingers high current probes are single piece construction to efficiently handle high current and provide low contact resistance.



HIGH POWER PROBES - SELECTION GUIDE

	High current probes			High voltage probes		
	3 fingers	5 fingers	7 fingers	PA-HVT	PA-HVC	PA-HVC-10KV
Max current	40 A	65 A	100 A	2 A	2 A	2 A
Max voltage	500 V	500 V	500 V	3,000 V	5,000 V	10,000 V
Residual resistance (Typical)	≤ 5 mΩ	≤ 3 mΩ	≤ 1 mΩ	--	--	--
Leakage @ max. V	--	--	--	≤ 1 pA	≤ 600 pA	> 35 TΩ
Connector options	Banana ^[3] plug or BNC ^[4]			HV triaxial ^[2]	SHV	10 KV UHV or banana ^[3] plug
Replaceable tip	Yes	Yes	Yes	Yes	Yes	Yes
Probe pitch ^[1]	350 μm (Std)	350 μm (Std)	350 μm (Std)	Single needle	Single needle	Single needle

^[1]Configurable

^[2]Keysight or Keithley

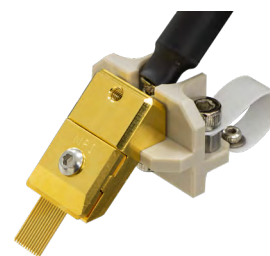
^[3]Banana: 100 A max, 1 ms max PW, 1% max PLC

^[4]BNC: 40 A max, 1 ms max PW, 1% Max PLC

ULTRA HIGH POWER PROBES

Ultra High Power Probe (UHP)

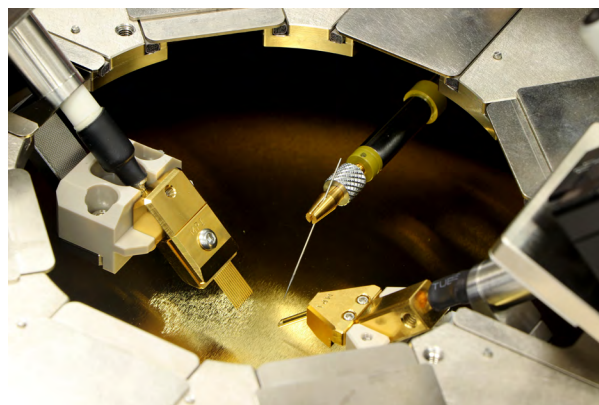
Designed for Ultra high voltage and current on wafer measurement up to 10 kV/600 A (pulse). MPI replaceable multi-fingers probes tips and probe arms are design for low contact resistance for ultra-high current measurement and to support ultra-high voltage of up to 10 KV, without having to change probes for high voltage and current application.



ULTRA HIGH POWER PROBES - SELECTION GUIDE

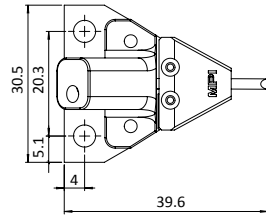
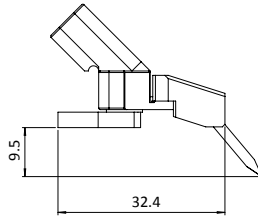
	1 finger	4 fingers	6 fingers	8 fingers	12 fingers
Max current*	20 A	80 A	120 A	160 A	250 A
Max voltage	10 KV	10 KV	10 KV	10 KV	10 KV
Residual resistance (Typical)	≤ 5 mΩ	≤ 3 mΩ	≤ 1 mΩ	≤ 1 mΩ	≤ 1 mΩ
Connector options	Banana	Banana	Banana	Banana	Banana
Replaceable tip	Yes	Yes	Yes	Yes	Yes
Probe tip width	250 μm	250 μm	250 μm	250 μm	250 μm
Probe pitch	--	650 μm	650 μm	650 μm	650 μm

*1 ms Max PW, 0.4% max PLC

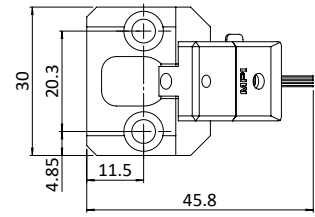
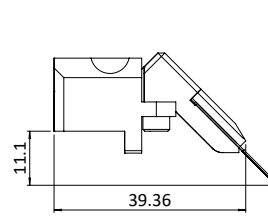


DIMENSIONS

High current probe



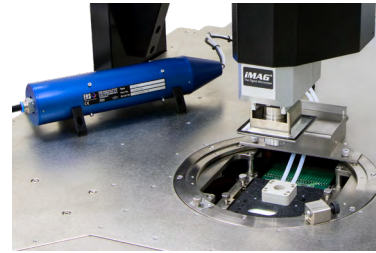
Ultra High Power probe



ANTI-ARCING SOLUTIONS

Optional Anti-Arcing Probe Card

In addition, MPI is offering optional temperature control of the pressurized air in a range of 20 to 200 °C, which correlate direct with the chuck set temperature. High-voltage testing without arcing at higher temperatures are possible now.



Optional Anti-Arcing LiquidTray™

Specially designed anti-arcing LiquidTray™ can be used for arcing suppressing by simply place on the high power chuck surface. Wafers can be safely placed inside the tray to submerge in the liquid for arcing free high voltage test.

NON-THERMAL CHUCKS

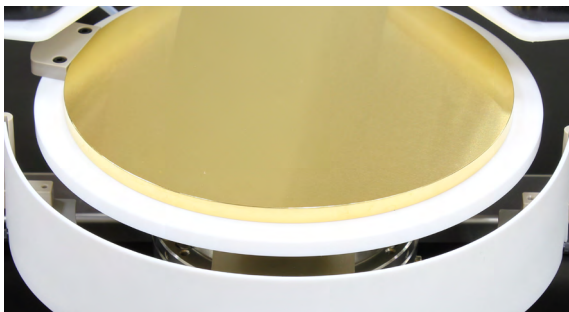
High Power Wafer Chucks

Connectivity 1	10 kV Coaxial (Banana or SHV)
Connectivity 2	Kelvin Triax (f), 3 kV or 10 kV Coaxial
Diameter	310 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)	4, 24, 48, 72, 96, 120, 144, 168, 192, 216, 240, 264, 288 mm
SmartVacuum™ distribution	In front for single DUT 5x5 mm (4 holes) and 75 mm (3 in) In center for 150, 200, 300 mm (6, 8, 12 in)
Supported DUT sizes	Single DUTs down to 5x5 mm size or wafers 100 mm (4 in) thru 300 mm (12 in)*
Surface planarity	≤± 5 µm
Rigidity	< 15 µm / 10 N @edge

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

Electrical Specification (Triax)

Chuck isolation	> 30 TΩ
Force to guard	> 30 TΩ
Guard to shield	> 500 GΩ
Force to shield	> 100 GΩ



MPI Non-thermal Triaxial High Power Chuck with gold plated surface for low contact resistance



MPI 10 kV Triaxial Connector used for Kelvin chuck connection

HIGH POWER THERMAL CHUCKS

Specifications	TC-300N Power Series	TC-300NT Power Series	TC-300NT ULN Power Series	
Max. Voltage	1.1 kV	3 kV	3 kV Triax or 10 kV Coax	
Connectivity	Keithley Kelvin Triax (f)	MPI Kelvin Triax (f)	MPI Kelvin Triax (f)	
Temperature Range - Minimum	-60 °C, -40 °C, -10 °C, 20 °C or 35 °C versions			
Temperature Range - Maximum	200 °C	200 °C	300 °C	
Temperature control method	Cooling air / Resistance heater			
Coolant	Air (user supplied)	Air (user supplied)	Air (user supplied)	
Smallest temperature selection step	0.1 °C	0.1 °C	0.1 °C	
Chuck temperature display resolution	0.01 °C	0.01 °C	0.01 °C	
External touchscreen display operation	Yes	Yes	Yes	
Temperature stability	±0.5 °C	±0.5 °C	±0.5 °C	
Temperature accuracy	±0.1 °C	±0.1 °C	±0.1 °C	
Control method	Low noise DC/PID	Low noise DC/PID	Low noiseDC/PID	
Chuck pinhole surface plating	Gold** (others on requests)			
SmartVacuum™ distribution*	In front for single DUT 5x5 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			
Temperature uniformity	< ±0.5 °C at ≤ 200 °C	< ±0.5 °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	
Heating rates**				
-60 to 25 °C	< 6 min	< 6 min	< 6 min	
-40 to 25 °C	< 5 min	< 5 min	< 5 min	
-10 to 25 °C	< 3 min	< 3 min	< 3 min	
35 to 200 °C	< 16 min	< 25 min	< 25 min	
20 to 200 °C	< 18 min	< 32 min	< 32 min	
35 to 300 °C	N/A	N/A	< 45 min	
20 to 300 °C	N/A	N/A	< 50 min	
Cooling rates** (faster with -60 °C chiller)				
AC3 Mode	25 to -10 °C	< 11 min	< 12 min	< 18 min
	25 to -40 °C	< 18 min	< 28 min	< 28 min
	25 to -60 °C	< 36 min	< 66 min	< 66 min
	200 to 35 °C	< 24 min	< 35 min	< 35 min
	200 to 20 °C	< 28 min	< 48 min	< 48 min
	300 to 35 °C	N/A	N/A	< 41 min
	300 to 20 °C	N/A	N/A	< 54 min
TURBO Mode	25 to -10 °C	< 11 min	< 12 min	< 18 min
	25 to -40 °C	< 16 min	< 27 min	< 27 min
	25 to -60 °C	< 34 min	< 65 min	< 65 min
	200 to 35 °C	< 24 min	< 35 min	< 35 min
	200 to 20 °C	< 28 min	< 48 min	< 48 min
	300 to 35 °C	N/A	N/A	< 41 min
	300 to 20 °C	N/A	N/A	< 54 min

Leakage

@ Voltage and:	10 V	1.1 kV	10 V	3 kV	10 V	3 kV	10 kV
@ -60 °C	< 2 pA	< 220 pA	< 300 fA	< 100 pA	< 30 fA	< 10 pA	< 6 nA
@ 25 °C	< 1 pA	< 110 pA	< 150 fA	< 50 pA	< 15 fA	< 5 pA	< 6 nA
@ 200 °C	< 1 nA	< 110 nA	< 300 fA	< 150 pA	< 30 fA	< 10 pA	< 15 nA
@ 300 °C	N/A	N/A	N/A	N/A	< 50 fA	< 15 pA	< 40 nA

Capacitance

Force-to-Guard	< 1600 pF	< 600 pF	< 600 pF
Guard-to-Shield	< 2000 pF	< 2000 pF	< 2000 pF
Residual Capacitance	N/A	≤ 2.5 pF	≤ 2.5 pF

* Taiko-wafer support is optional available, please contact MPI local technical support.

** Typical values, depends on chiller type and facility supply, please check MPI FPS for the certain chuck and system.

THERMAL CHUCKS DIMENSIONS

System Controller / Chiller Dimensions and Power / Air Consumption

System type	W x D x H (mm)	Weight (kg)	Power cons. (VA)	max. Air flow* (l/min)	CDA dew Point
Ambient	300 x 360 x 135	12	1200	400	≤ 0 °C
20°C, -10 °C to 200 / 300 °C	300 x 360 x 135	12	1200	400	≤ -30 °C
-40 to 200 / 300 °C	420 x 300 x 520	45	1200	400	≤ -40 °C
-60 to 200 / 300 °C	420 x 500 x 1020	140	2400	450	≤ -40 °C
Electrical primary connection	100 to 240 VAC auto switch				
Electrical frequency	50 Hz / 60 Hz				
Compressed air supply	6.0 bar (0.8 MPa, 87 psi)				

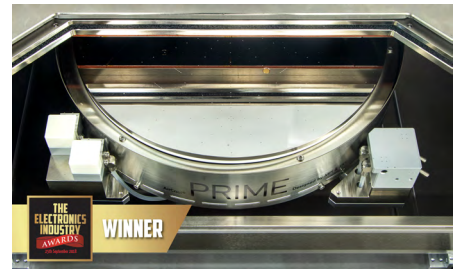


ERS AirCool® Fusion*, Controller Integrated Chiller -40 °C / -60 °C



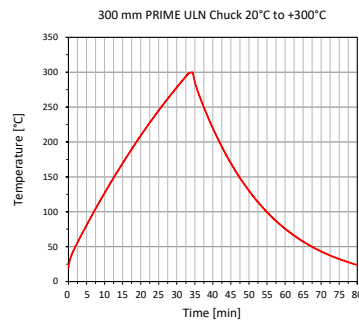
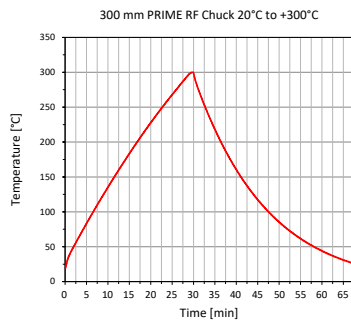
ERS AirCool® Fusion*, Controller Integrated Chiller -10 °C

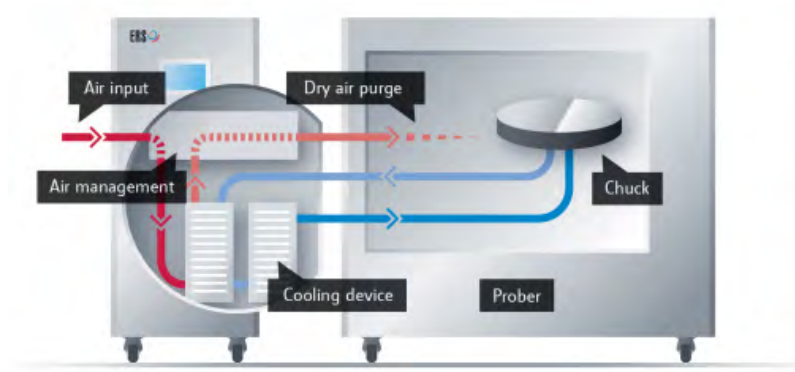
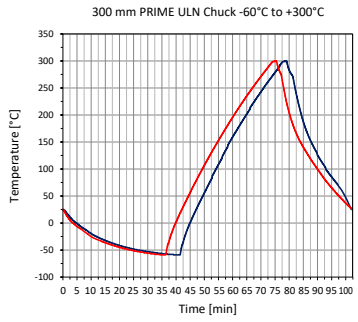
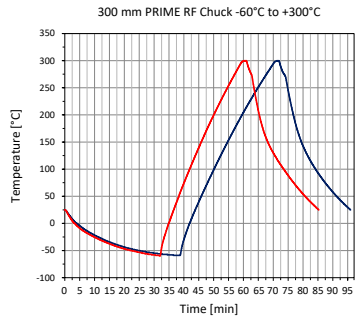
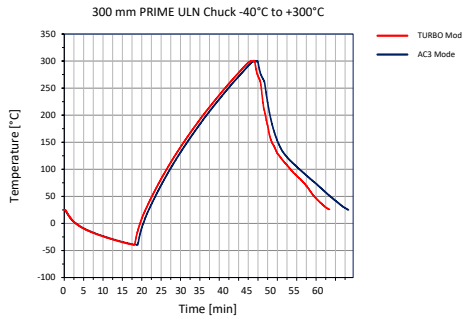
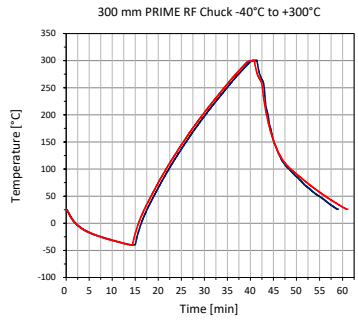
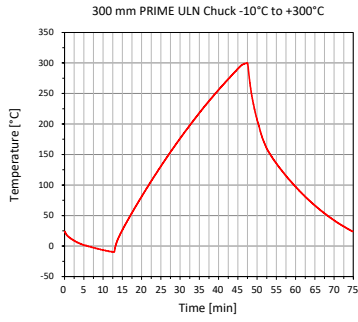
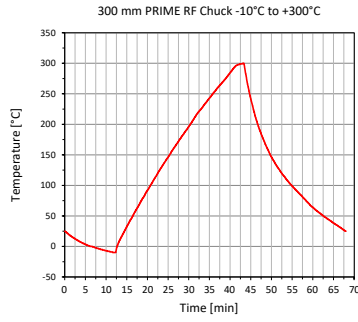
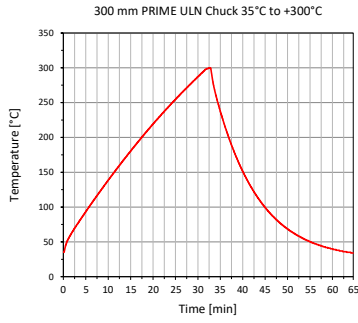
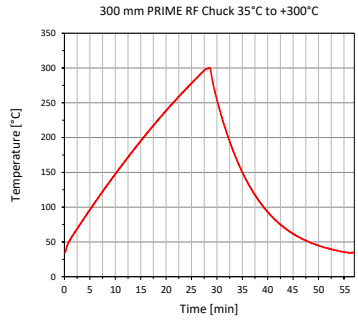
*ERS electronic GmbH patented solution



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".

TYPICAL TRANSITION TIME





These chucks incorporate the ERS patented AC3 cooling technology and its air management system to purge the MPI ShieldEnvironment™ directly from “already used” air – reducing dry air consumption up to 30 to 50% as compared to other systems on the market.
 Copyright belongs to ERS electronic GmbH

FACILITY REQUIREMENTS

Thermal Chuck Electrical Supply

Electrical Supply	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 for hot chuck system (ambient to 300 °C) ≤ -45 °C for hot and cold chuck system (-60 °C to 300 °C)

General Probe System

Power	100-240 V AC 50/60 Hz for optical accessories* only
Vacuum	-0.5 bar (for single DUT) / -0.3 bar (for wafers)
Compressed air	6.0 ~ 7.0 bar

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

WARRANTY

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

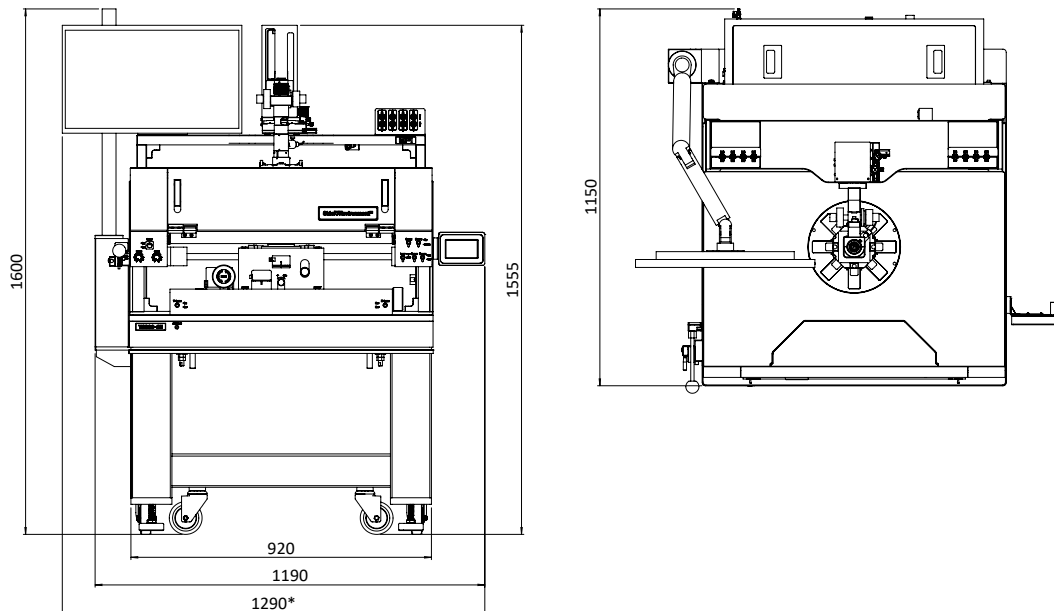
*See MPI Corporation's Terms and Conditions of Sale for more details.

PHYSICAL DIMENSIONS

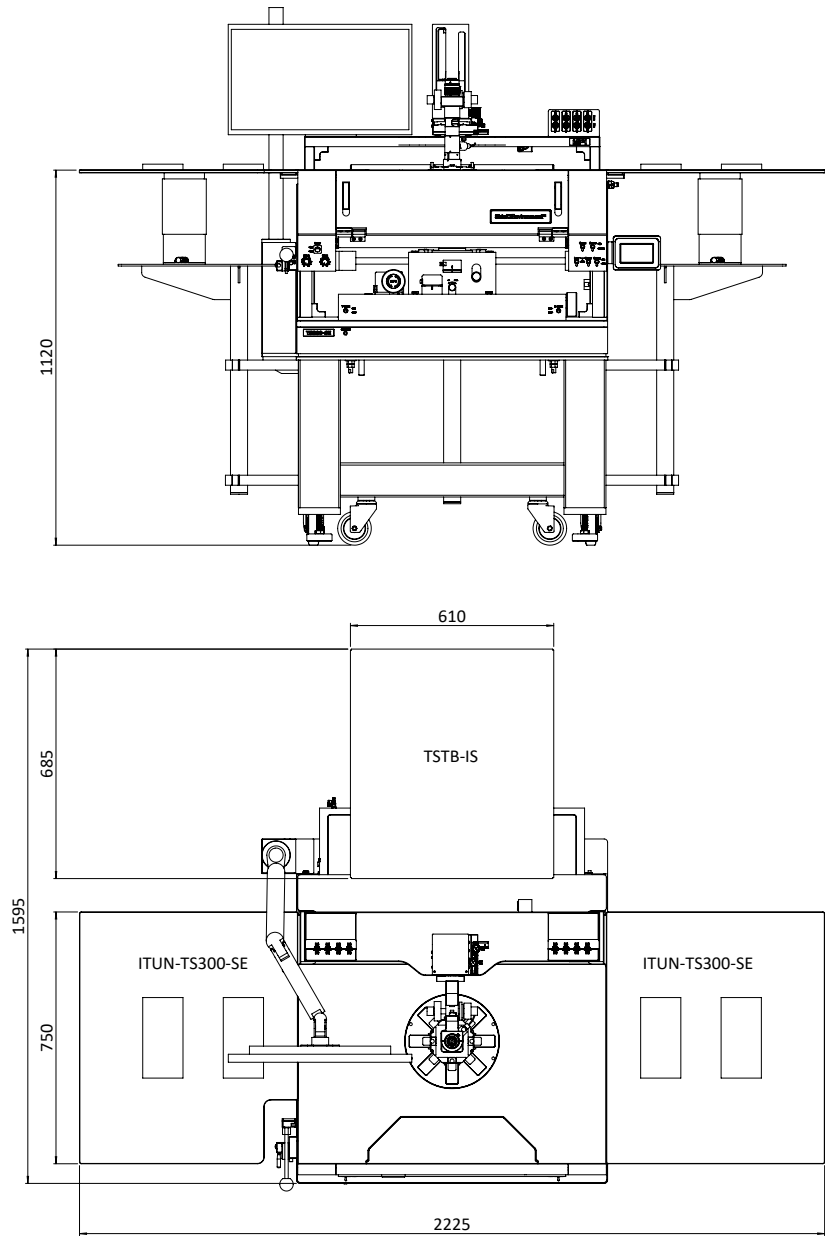
Station Platform with Bridge*

Dimensions (W x D x H)	1190 x 1150 x 1600 mm (46.9 x 45.3 x 63.0 in)
Weight	~600 kg (1322.8 lb.)

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



TS300-SE with ITUN-TS300-SE and Instrument Shelf



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MPI global presence: for your local support, please find the right contact here:
www.mpi-corporation.com/ast/support/local-support-worldwide

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MPI Global Presence

