

MPI TS300-PCB | 300 mm Manual PCB Probe System

For Accurate and Reliable RF and mmW Measurements on PCB Boards

FEATURES / BENEFITS

Dedicated Use

- Designed for PCB probing in various DC/CV and RF measurement configurations
- Signal integrity
- SENTIO® option for efficient probing through microscope automation
- PCB holders from 2" x 2" to 24" x 20" size
- Integrated AUX chucks for RF calibration

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



CHUCK STAGE MOVEMENT

| | |
|-------------------------|--|
| Total XY travel range | 330 x 395 mm (13.0 x 15.6 in) |
| Fine-travel range | 25 x 25 mm fine micrometer control |
| Fine-travel resolution | < 1.0 μm (0.04 mils) @ 500 $\mu\text{m}/\text{rev}$ |
| Planarity | < 10 μm |
| Theta travel (standard) | 360° |
| Theta travel (fine) | $\pm 5.0^\circ$ |
| Theta resolution | 7.5×10^{-3} gradient |
| Movement | Puck controlled air bearing stage |

MICROSCOPE STAGE MOVEMENT

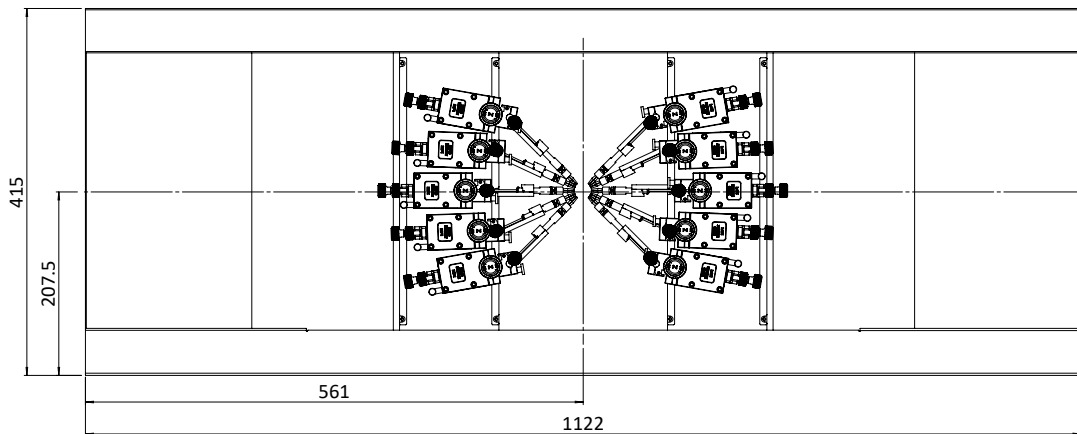
| | | |
|---------------------------|-----------------------------------|--------------------|
| Total XY travel range | 550 x 300 mm manual fast movement | |
| Fine travel option | XYZ Programmable* | XYZ manual |
| XY - Travel range | 50 x 50 mm | 50 x 50 mm |
| Resolution | 1 µm (0.04 mils) | < 5 µm (0.2 mils) |
| Repeatability | < 2 µm (0.08 mils) | N/A |
| Accuracy | < 5 µm (0.2 mils) | N/A |
| Z - Travel range | 140 mm linear | 90 degree tilt |
| Resolution | 0.05 µm (0.002 mils) | N/A |
| Repeatability | < 2 µm (0.08 mils) | < 2 µm (0.08 mils) |
| Accuracy | < 4 µm (0.16 mils) | N/A |

*Requires SENTIO® for manual systems

PROBE PLATEN

Specifications

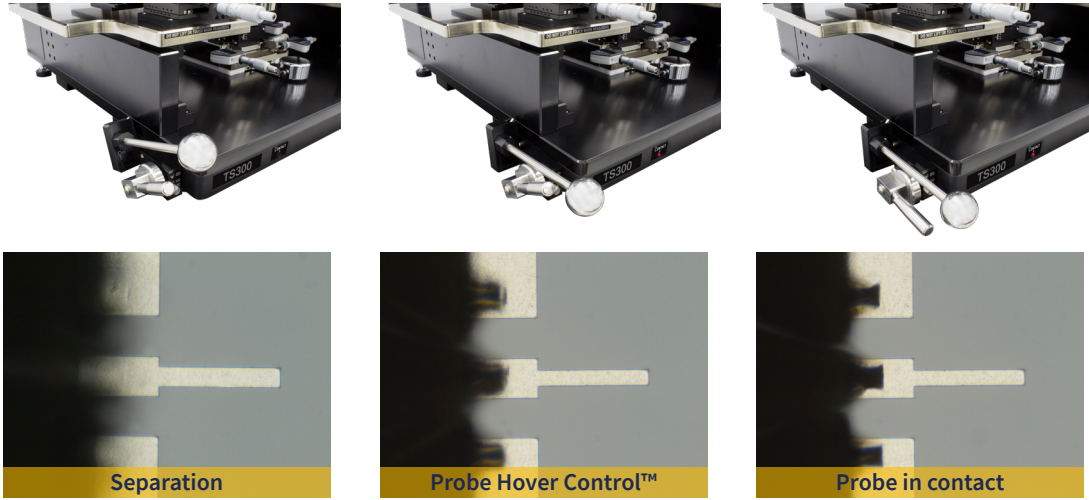
| | |
|-----------------------------|--|
| Material | Nickel plated steel |
| Dimension | See drawing |
| Chuck to platen height | Min. 28 mm |
| Max. No of MicroPositioners | 10 DC or 4 RF |
| Platen lift control | 3 positions - contact (0), separation (300 µm), and loading (3 mm) |
| Platen Z-height movement | Micrometer adjustment for fine control |
| Z-height adjustment range | Max. 20 mm (0.8 in) |
| Separation repeatability | ± 1 µm (0.04 mils) by „Auto Contact“ |
| RF MicroPositioner mounting | Magnetic with rectangular adjustment |
| DC MicroPositioner mounting | Magnetic |
| Probing area | 500 x 460 mm |



Universal probe platen design for up to 10 DC MicroPositioners

PLATEN LIFT WITH PROBE HOVER CONTROL™

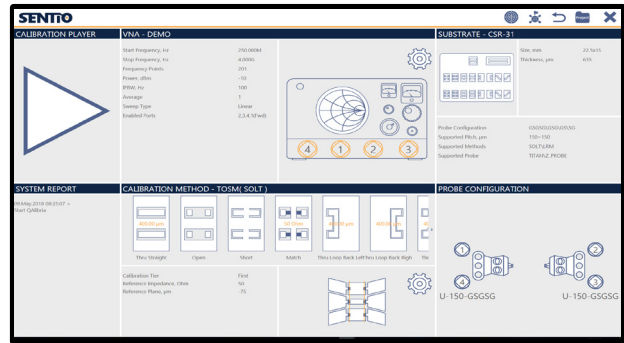
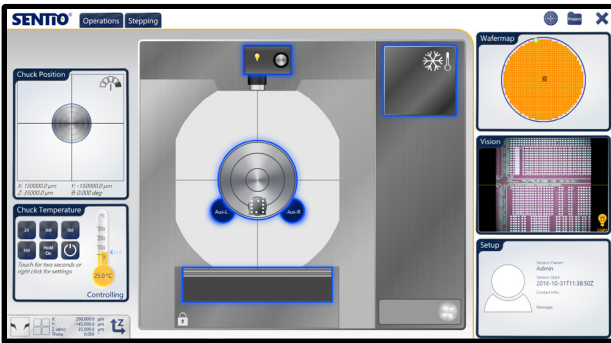
MPI Probe Hover Control™ comes with hover heights (50, 100 or 150 μm) for easy and convenient probe to pad alignment.



SENTIO® FOR MANUAL SYSTEMS OPTION

MPI offers SENTIO® optionally for manual probe systems. The revolutionary multi-touch, single window GUI is designed for easy and intuitive system operation and saves significant training time. The scroll, zoom, and move commands mimic modern smart mobile devices, so anyone can become an expert in minutes. Switching between the active application and the rest of the APPs is just a matter of a simple finger swipe. GPIB and TCP/IP interface is also available for remote control.

By implementing intuitive multi-touch operation, QALibria® provides crisp and clear guidance to the RF calibration process, minimizes configuration mistakes and helps to reach accurate calibration results in fastest time. QALibria® offers industry standard and advanced calibration methods. QALibria® includes TOSM (SOLT), TMR, TMRR methods, and 4-port calibration capability additionally to the integration of NIST StatistiCal calibration packages providing easy access to the NIST multiline TRL metrology-level calibration and uncertain analysis.



SENTIO® for manual probe systems has all controls fully integrated. The intelligent hardware control panel is designed to provide faster, safer and more convenient system control and test operation. Keyboard and mouse are strategically located to operate the Windows® 10 based operating system. Control of the thermal chuck can be accessed via the fully integrated touchscreen display, conveniently placed in front of the operator for quick operation and immediate feedback. USB connection to the systems controller is located right in front for easy data exchange.



SYSTEM CONTROLLER SPECIFICATIONS

| | |
|-------------------------------|---|
| CPU | Intel® Core™ i7-7700, 3.6 GHz, 8M Cache, 14nm, 65W TDP, LGA1151 (4C/8T) |
| RAM | DDR4 2400 MHz 16 GB x 1 |
| 64 bit operating system | Windows 10 Professional (English) |
| Power | 460 W |
| Storage | SSD 500 GB |
| LAN | One internal and one external TCP/IP ports |
| USB Ports | Internal (on PC) x3, external x1 |
| GPIB interface | Optional |
| Power of general probe system | 100-240 V AC nominal ; 50/60 Hz |

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 holes 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

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 $\leq 0\text{ }^{\circ}\text{C}$

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

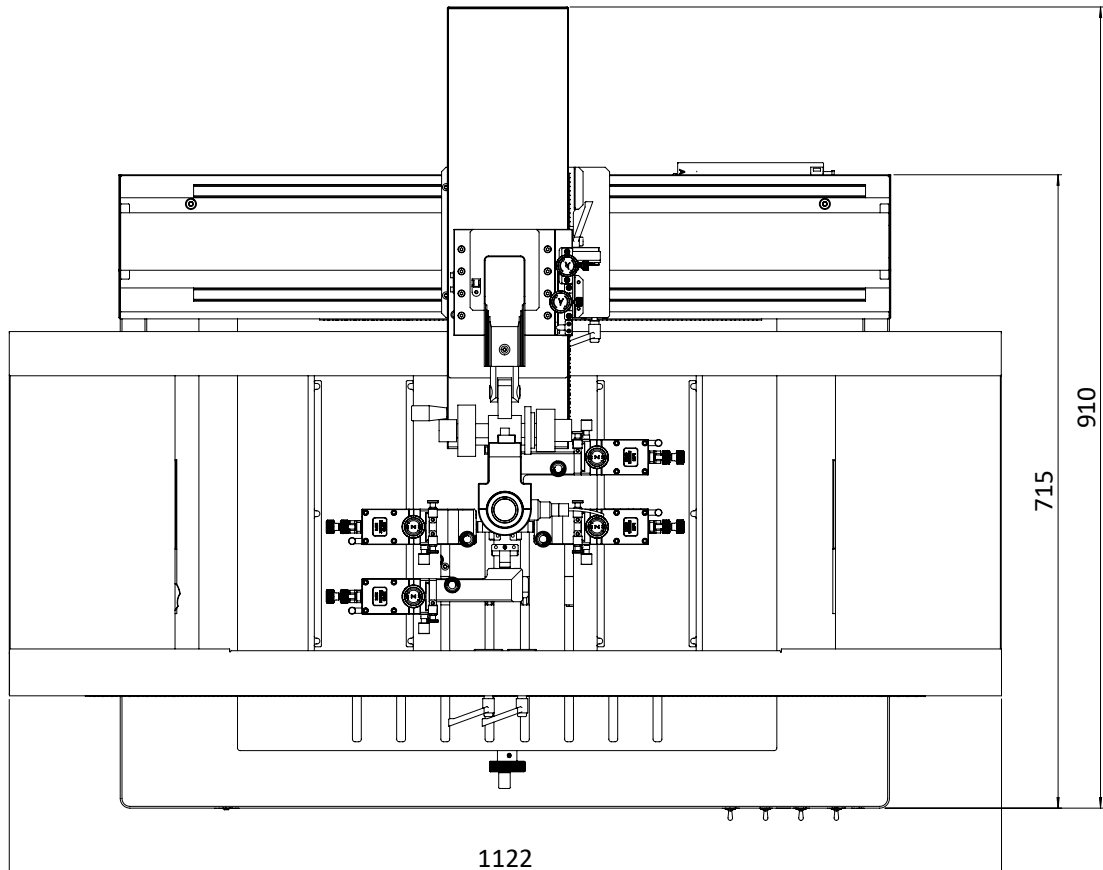
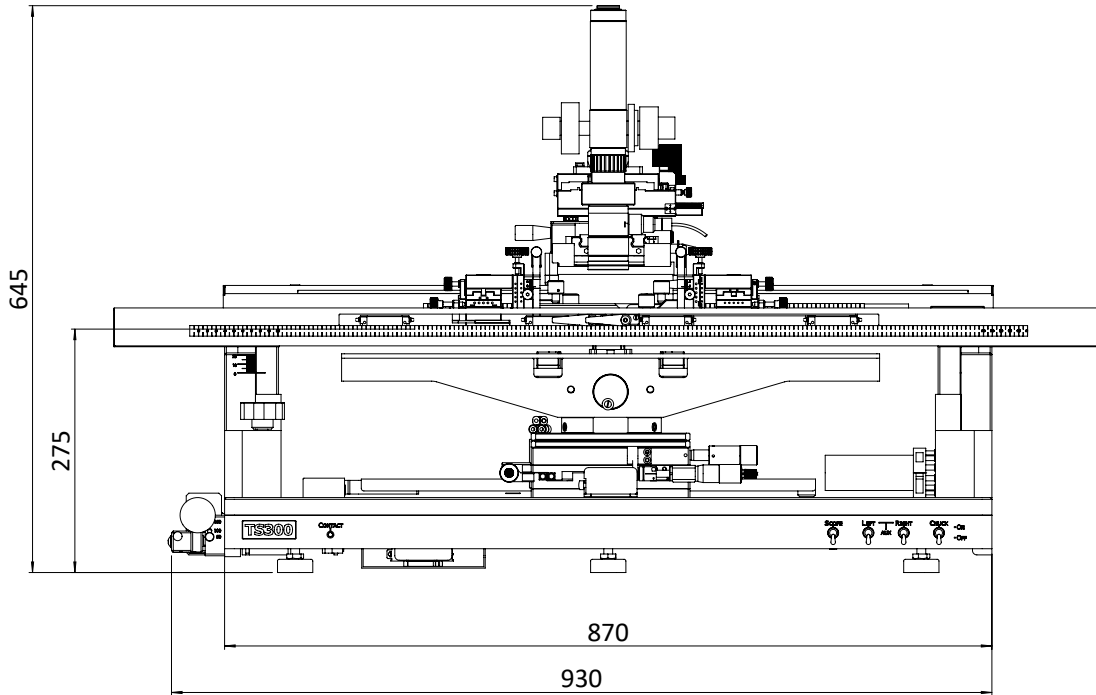
*See MPI Corporation's Terms and Conditions of Sale for more details.

■ PHYSICAL DIMENSIONS

Station Platform with Bridge*

| | |
|------------------------|--|
| Dimensions (W x D x H) | 930 x 910 x 645 mm (36.6 x 35.8 x 25.4 in) |
| Weight | ~110 kg (242 lb.) |

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



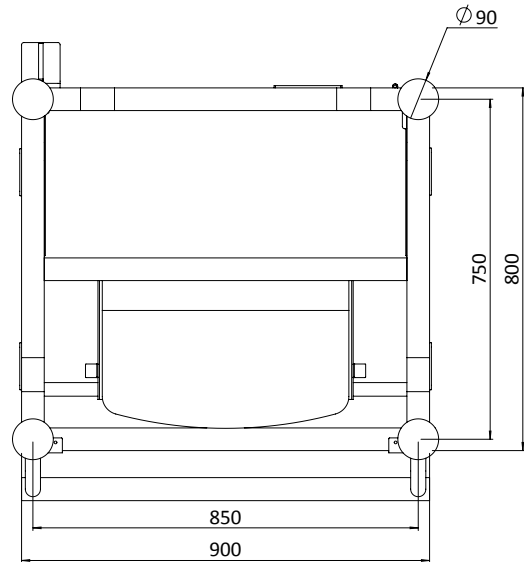
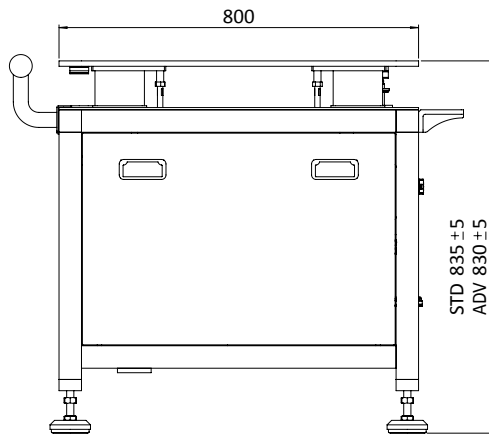
VIBRATION ISOLATION OPTION

The probe station has been designed for bench top use and includes a vibration absorber base. In addition to that a standard or advanced vibration isolation table is available.

Vibration Isolation Table*

| | Standard | Advanced |
|--------------------------------|---|---|
| Dimensions (W x D x H) | 900 x 800 x 835 mm (35.4 x 31.5 x 32.9 in) | 900 x 800 x 830 mm (35.4 x 31.5 x 32.7 in) |
| Feature | Adjustable air damping system | Automatic load leveling |
| Keyboard / Mouse Tray Included | | Yes |
| Front Protection Bar | | Yes |
| Castors Included | | Yes |
| Shelves Included | | Upper and Lower |
| Accessories Accepted | Monitor Stand(s) and Instrument Shelf | |
| Weight | Approx. 210 kg (463 lb.) | Approx. 210 kg (463 lb.) |

*Vibration Isolation Table can be selected optionally..



Direct contact:
 Asia region: ast-asia@mpi-corporation.com
 EMEA region: ast-europe@mpi-corporation.com
 America region: ast-americas@mpi-corporation.com

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

© 2022 Copyright MPI Corporation. All rights reserved.

