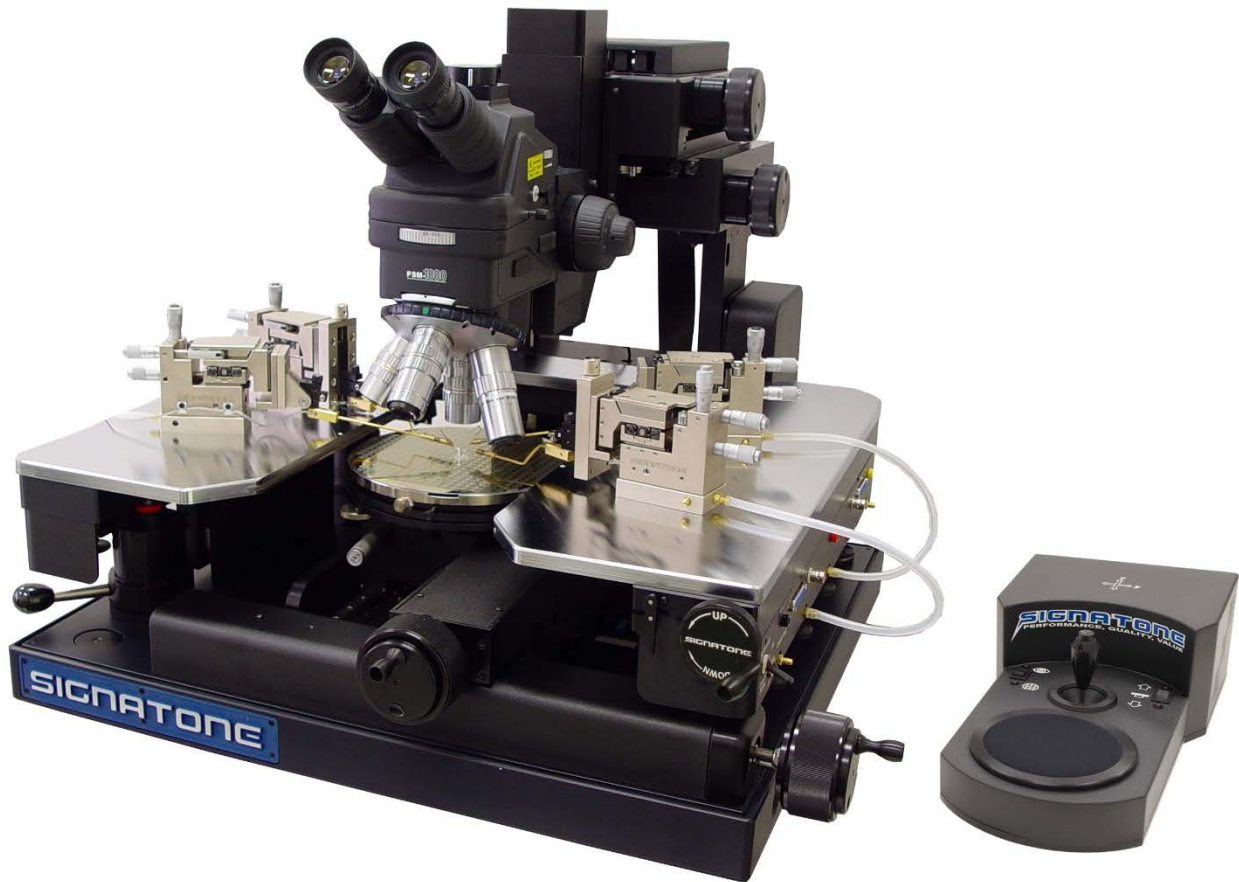


Signatone CM-220 200mm Precision Manual /Motorized Probe System with Joy-Stick .

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



❖ FEATURES / BENEFITS

Standard Features

- Ultra-stable 50mm thick Al base
- Fast and Fine control of DUT X-Y Knobs
- Motorized Microscope and DUT X-Y stage controlled with Analog- open loop Joy-Stick
- Three - Point Chuck planarization
- Micrometer Driven Chuck Theta-Rotation
- Selectable Pin-Hole Vacuum Zones
- Continuous Platen Lift (CVL) for ease of probe and DUT exchange.
- Fine Platen Lift with lock for DUT/probe setup
- Large Platen (Steel or Aluminum available*)
- Ultra-Stable Linear Microscope Stage

Designed for a Variety of On-Wafer Analytical Measurement Applications

- DC, CV/IV, pulsed -IV applications
- High Power Application up to 12KV /600A
- IC Design / test verification Ambient to +300°C
- RF applications up to 110GHz with 2 & 4 port setup

Product Versatility

- Designed for full or partial wafer probing
- Ultra-Stable solid base for sub- μ probing
- Variable Probe, Chuck, and Microscope configuration.
- Upgradable to motorized - Joy Stick or Semi-Automatic /step & repeat control
- Active Vibration Isolation table (optional)
- Hot Chuck System +300°C (optional)

❖ SPECIFICATIONS

Chuck XY Stage (Manual)

Travel range	205 mm x 205 mm (8.07 x 8.07 in)
Travel Resolution (standard)	14 µm Per Degree of Knob Rotation
Travel Resolution (Fine)	1.5 µm Per Degree of Knob Rotation
Drive Mechanism	Precision Leadscrew – Carriage and Rails

Chuck Z Stage (Pneumatic)

Travel range	2.5 mm (0.01 in)
Repeatability	± 1.0 µm
Z Stage Drive	Pneumatic Precision Lift

Chuck To Platen (Manual Adjust)

Separation (Quick Lift)	3.175mm (1/8")
Separation (Fine Lift)	38.1mm (1.5")

Chuck Theta Stage (Manual)

Travel range	± 11° (22°)
Resolution	0.01mm Per Degree of Knob Rotation
Accuracy	< 1.0 µm (measured at the edge of the 200 mm chuck)
Repeatability	< 1.5 µm
Theta Stage Drive	High Resolution Micrometer

Roll Out / Loading Stage * (optional for use with probe card adapter and RF probes)

Travel range	195mm
Presentation	190mm (view or access to the sample chuck for load/unload)
Return repeatability	< 1µm

Manual Microscope Stage (linear)

Movement range	50mm X 50mm (2"x2")
Resolution	< 2µm (2 x 10 ⁻⁴ mils)
Scope lift	101 mm (4") Vertical Pneumatic (Manual Knob- optional)

Analog Joy-Stick

Microscope X-Y Stage	50mm X 50mm (2"x2") motorized
DUT X-Y Stage	200mm X 200mm (8"x8") motorized
Motion Control	Analog open loop motors with dynamic speed control

❖ CM-220 Joy- Stick

Easily upgrade your CM-210 manual prober by simply adding the CM-220 motorization and Joy-Stick control.

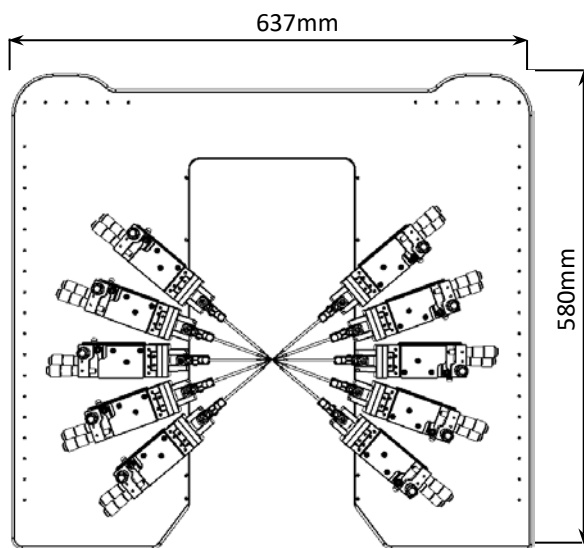


1. The open-loop motor Joy-Stick allows dynamic motion control of the microscope and wafer stage x-y. The selected device will travel in every direction the Joy-stick is point. *(note: manual knobs will also turn)*
2. Ergonomic hand rest for support during prolonged use.
3. Device selection rocker switch indicates use of microscope or DUT stage, LED selection indicator.
4. DUT "Z" chuck selector switch indicates with illuminated LED if the chuck is in the up or down position.

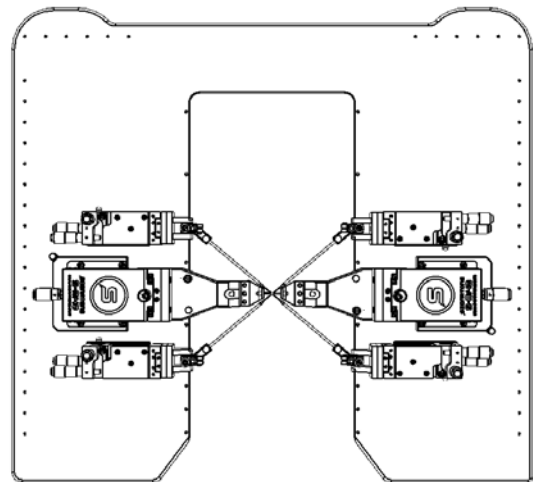
❖ PROBE PLATEN

Specifications

Material	Nickel Plated Steel (Al optional)
Dimension	L = 580mm x W = 637mm x H = 12.7mm (See drawing)
Chuck to Thermal Shield Separation	Min. 2 mm (Variable Separation with Fine Platen Adjust)
Max. No of Micro Positioners	10x DC/HV or 2x RF + 4 x DC or 4x RF + 2x DC or 2x CAP + 4x DC
Quick Platen Lift Control (CVL)	Continuous Variable Lift (0 to 3.175 mm)
Contact Repeatability	< 1 µm (0.04 mils) by Manual Control
RF MicroPositioner mounting	Magnetic or Bolt Down
DC MicroPositioner mounting	Magnetic or Vacuum
Thermal Isolation (Optional)	Platen Temp = +15 °C to +40°C /chuck @ -60 °C to +300°C



Sample4: Probe Configured with 10 DC Probes



Sample2: Probe Configured with 2 RF + 4 DC Probes

❖ ONE PLATEN x 4 BENFITS

Signatone Multi Benefit Ergonomically Correct Platen Adjust and Features:

- “Quick Lift” with CVL for easy probe to pad separation and alignment
- “Fine Adjust” for Probe card and variable Chucks and DUT thickness setup
- “Position Lock” allows for secure “lock” of user defined platen height setup
- “Thermal Isolation” maintains a safe temperature of probes and platen surface while chuck is at extreme temperatures (optional- liquid cooled platen)



Platen “Quick Lift”



Platen “Fine Adjust” and “Position Lock”

❖ **NON-THERMAL CHUCKS**

Standard Wafer Chuck

Connectivity	Coax BNC (m)
Diameter	203 mm
Material	Nickel Plated Brass (gold optional)
Chuck surface	Zone selector knob with Peppered vacuum patterns
Vacuum hole pattern sections(diameter)	22mm, 50mm, 91mm, 135mm, 168mm
Vacuum actuation	Selector Knob allows individual activation of vacuum zones
Supported DUT sizes	25mm, 75mm, 100mm, 150mm, 200mm
Surface planarity	±6.5μ
Rigidity	<3μ / 10N at edge of the chuck (N = pressure measured in Newtons)

Electrical Specification (Coax)

Operation voltage	Designed for operation at -200V to + 200VDC
Maximum voltage between chuck top and GND	500 V DC
Isolation	> 150 GΩ

Wafer Chuck (Triaxial)

Connectivity	Triax (m)
Diameter	203 mm
Material	Gold Plated Brass
Chuck surface	Independent Vacuum zones with vacuum rings
Vacuum hole pattern sections(diameter)	0mm, 65mm, 112mm, 162mm
Vacuum actuation	Multi-Zone Adjustable Control
Supported DUT sizes	3mm, 75mm, 125mm, 200mm
Surface planarity	± 5 μm
Rigidity	<3μ / 10N near at edge of the chuck

Electrical Specification (Triax)

Chuck isolation	Measured @ 10V DC
Force to guard	> 2 TΩ
Guard to shield	> 7 TΩ
Force to shield	> 15 TΩ

Auxiliary Chuck

	*(Optional: for use with RF applications)
Quantity	1-2 AUX chucks *
Position	Independently isolated (located on back left and right)
Substrate Size (L x W)	Max 25mm x 25mm (1"x 1")
Material	Ceramic, Ultem, or NI plated brass
Surface Planarity	≤± 5 μm
Vacuum Control	Controlled independently, separate from wafer chucks

❖ **SIGNATONE THERMAL CHUCKS**

Typical Specifications of *Signatone* Thermal Technology

	200mm Standard Hot	200mm Hot/ Triax	200mm Hot/ 3kV Triax
Temperature Range	+25 °C to +300 °C	+25 °C to +200 °C	+25 °C to +200 °C
Connectivity	Coax (m)	Triax (m)	SHV Triax (m)
Temperature control method	Liquid Cooled / Resistance heater	Liquid Cooled / Resistance heater	Liquid Cooled / Resistance heater
Coolant	Water	Water	Water
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	±0.1 °C	±0.1 °C	±0.1 °C
Temperature accuracy	±0.5 °C	±0.5 °C	±0.5 °C
Control method	Low noise DC/PID	Low noise DC/PID	Low noise DC/PID
Interfaces	RS232C	RS232C	RS232C
Optional Interfaces	GP-IB	GP-IB	GP-IB
Chuck surface plating	Nickel	Gold	Gold
Temperature sensor	RTD	RTD	RTD
Temperature uniformity	±0.5 °C at ≤ 200 °C ±1.5 °C at > 200 °C	±0.5 °C at ≤ 100 °C ±2.5 °C at 200 °C	±0.5 °C at ≤ 100 °C ±3.5 °C at 200 °C
Surface flatness	< ±10 µm	< ±8 µm	< ±15µ
Electrical isolation - Coax BNC (m) / SHV Triax	150nA	> 5TΩ	> 5TΩ
Heating Rates	25°C to 300°C < 12 min	25°C to 200°C < 9 min	25°C to 200°C < 28 min
Cooling Rates	300°C to 25°C < 9min	200°C to 25°C < 8min	200°C to 25°C < 8min
Leakage @ 10 V Kelvin Triax	N/A	<25fA	<400fA
Residual Capacitance		<200fF	<1pF
Maximum voltage between chuck top and GND	500V	500V	3kV
3 Safety Circuits	Yes	Yes	Yes
Vacuum Pattern	Rings	Pin hole	Pin hole
Vacuum Zone (DUT Size)	50, 100, 150, 200mm	2, 50, 100, 150, 200mm	2, 50, 100, 150, 200mm

*All data is relevant for chucks in ECO mode

System Controller / Dimensions / Weight / Power Consumption

System Model	W x D x H (mm)	Weight (kg)	Weight (Lbs.)	Power cons. (VA)
S-1080	432 x 483 x 267	20.4	45	2000
TC-II	355 x 711 x 610	50.8	112	1500
2XRC-89HL	559 x 610 x 915	135	297	3700

❖ **ERS HIGH POWER THERMAL CHUCKS**

Specifications of ERS/ SIGNATONE Technology HV 200mm Chucks

Temperature Range	25 °C to 200 °C	25 °C to 300 °C
Connectivity	Kelvin Triax (M),3kV or 10 kV Coaxial	Kelvin Triax (M),3kV 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 (optional)	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 at ≤ 200 °C	< ±0.5 °C at ≤ 300 °C
Surface flatness and base parallelism	< ±10 µm	< ±10 µm
Heating and Cooling Rates*	25 to 200°C <30min 200 to 25°C <30min	25 to 300°C <35min 300 to 25°C <35min
Leakage @ 3000V Kelvin Triax (M)		
25°C	5pA	5pA
200 °C	10pA	10pA
300°C	--	15pA
Leakage @ 10kV Coax UHV/SHV(M)		
25°C	6nA	6nA
200 °C	6nA	6nA
300°C	--	6nA
Maximum voltage between chuck top and GND	10 kV DC	10 kV DC

*All data is relevant for chucks in ECO mode

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)
25 to 200 °C	300 x 360 x 135	12	1300	220
25 to 300 °C	300 x 360 x 135	12	1300	220

*All data is relevant for chucks in ECO mode

❖ MICRO POSITIONER

Choose the Micro Positioner that’s best for your application (more positioner configurations available)

The CheckMate Series probe stations include an Aluminum or Steel Platen for use with Vacuum or Magnetic based micro Positioners

- The **S-926** Series with 100 TPI rectilinear X-Y-Z motion, good for probing down to one micron, at a very competitive price
- The **SP-100** Series with 100 TPI linear X-Y-Z motion with in-line micrometer knobs for high precision probing one-micron features at high magnification – great for use with multi probe applications
- The **SP-150** Series with 100 TPI linear X-Y-Z motion with in-line micrometer knobs for high precision probing sub-micron features at high magnification – great for use with multi probe applications
- The **S-M40** Series RF Positioner with 50 TPI linear X-Y-Z motion with in-line precision knobs for quick and accurate positioning of RF probes – great for use with RF and Wedge probe applications DC-110GHz.
- The **S-M90** Series RF Positioner with 50 TPI linear X-Y-Z motion with precision knobs at 90° for quick and accurate positioning of RF probes – great for use with RF and Wedge probe applications DC-110GHz.
- The **CAP-946** Series Motorized Positioner with Software controlled X-Y Z 20nm resolution. Including 25mm X-Y travel (8mm “Z”) Software, Joys Stick & Thumbwheel Control (excellent for use with Dark box or Gove box applications)



S-926PLM



SP-100PM



SP-150PM



S-M40-MMEW



S-M90-MMEW



CAP-946M

❖ **DC PROBE –SELECTION GUIDE**

	Coax Probe (C)	Triax Probe (T)	Kelvin Probe (K)
Max voltage	500 V	500 V	500 V
Temperature range	-60 °C to 300 °C	-60 °C to 300 °C	-60 °C to 300 °C
Leakage current	< 50fA	< 20fA	< 20fA
Connectivity	BNC	Standard Triax	SSMC
Connectivity type	Single Coaxial	Single low noise Triaxial	Force/Sense Coax
Characteristics impedance	50 Ohms	50 Ohms	50 Ohms
Residual capacitance	< 80fF	< 80fF	< 80fF
Probe holder material	Brass	Brass	Brass
Probe tips material	Tungsten	Tungsten	Tungsten
Probe tips sizes	0.5 µm – 25 µm	0.5 µm – 25 µm	0.5 µm – 25 µm
Minimum pad size	25 µm x 25 µm	25 µm x 25 µm	25 µm x 25 µm



Coax Probe



Triax Probe



Coax Kelvin Probe

❖ **High Voltage/High Current PROBE –SELECTION**

Model	High Voltage Probes			High Current Probe
	HVP-CX-3	HVP-TX-3	HVP-CX-10	HCP 100
Max Voltage	3 kV	3 kV	10 kV	500 V
Max Current	1 A DC/30 A Pulsed	120 mA DC	20 mA DC	10 A DC/100 A Pulsed
Temperature Range	-60 °C to 300 °C	-60 °C to 300 °C	-60 °C to 300 °C	-60 °C to 300 °C
Leakage Current	< 200 pA @ 3 kV, < 5 pA @ 10 V	< 1 pA @ 3 kV, < 100 fA @ 10 V	< 100 pA @ 10 kV	N/A
Connector Type	SHV	HV Triax	UHV Coax	HV Banana
Replaceable Tip	Yes	Yes	Yes	Yes
Probe Material	W	W	W	BeCu or W



HVP-CX-3



HVP-TX-3



HVP-CX-10



HCP-100

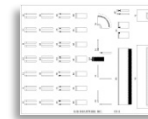
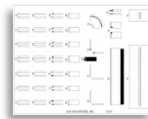
*All leakage tests conducted in an enclosed environment with Keithley 4200, or equivalent, in sampling mode with 10 PLC, auto-ranging. 0.25s interval

❖ RF PROBE –SELECTION GUIDE



Cable Interface

	SP-40A	SP-50A	SP-67A	SP-110H	SP-145
Frequency	DC-40GHz	DC-50GHz	DC-67GHz	DC-110GHz	DC-145GHz
Connector	2.92mm	2.4mm	1.85mm	1.0mm	0.8mm
Tip Configuration	GS/SG/GSG	GS/SG/GSG	GS/SG/GSG	GS/SG/GSG	GSG
Pitch Range	50μ - 2540μ	50μ - 1250μ	50μ - 1250μ	50μ - 1250μ	50μ - 200μ
Insertion Loss	<.8db	<1.0db	<1.1db	<1.5db	<1.75db
Return Loss	> 18db	>18db	>14db	>15db	>15db



Calibration Substrates

GSG	SP-CS-5	SP-CS-9	SP-CS-10	SP-CS-18
Pad Size	50μ X 50μ	100μ X 100μ	150μ X 150μ	300μ X 300μ
	100μ X 100μ			
	150μ X 150μ			
Pitch Range	75μ - 250μ	250μ - 600μ	600μ - 1250μ	1250μ - 2540μ

GS/SG	SP-CS-8	SP-CS-14	SP-CS-11	SP-CS-17
Pad Size	50μ X 50μ	100μ X 100μ	150μ X 150μ	300μ X 300μ
	100μ X 100μ			
	150μ X 150μ			
Pitch Range	50μ - 200μ	200μ - 400μ	400μ - 1250μ	750μ - 2540μ

GSG > 110GHz	SP-CS-15
Pad Size	25μ X 25μ
Pitch Range	40μ - 150μ (SOLT) 30μ - 150μ (LRM)



RF Cables

	RFC-40	RFC-50	RFC-67	RFC-110
Frequency Range	DC - 40GHz	DC - 50GHz	DC - 67GHz	DC - 110GHz
Length	4 Ft.	4 Ft.	3 Ft.	*
Connectors	2.92 M – 2.92 F	2.4 M – 2.4 F	1.85 M - 1.85 F	1.0 M - 1.0 F

* Contact Factory

❖ **SYSTEM OPTIONS – ACCESSORIES**

Probe Station Dark Box (PSDB-CM)

Probe Station light tight, electrically shielded enclosure
Excellent for use in conjunction with the following:

- Low-Leakage measurements
- High-Power measurements
- Thermal measurements
- Light-Sensitive measurements

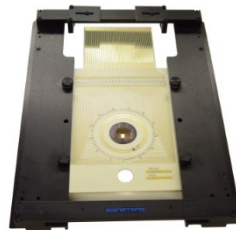
Door and Panel interlock options are typically used for High Voltage and High Temperature safety



PSDB-CM

Probe Card Adapter (S-4710)

For use with 4.5" wide probe cards



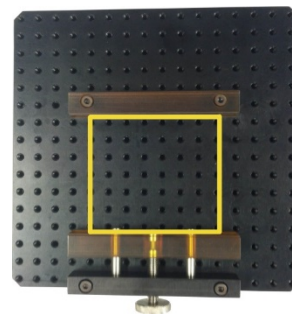
S-4710

CM-BMVC

Board Mount Vice Chuck

The CheckMate Series probe stations supports the 200mm x 200mm adjustable Vice chuck

- For clamping various size and shaped devices, packaged parts, PCB's, single chips, MEMS, BioMEMS or virtually anything you want to hold view and probe
(VICE Clamps are non-conductive ULTEM)



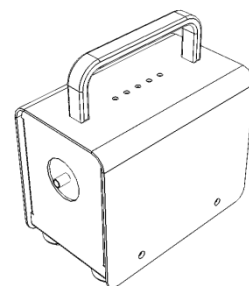
CM-BMVC

M-VAC

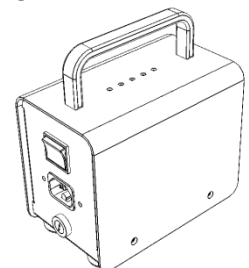
AC Linear Piston – (Small) Quiet Vacuum Pump

Supports vacuum hold-down of DUT and mounting of 1-10 Micro-positioners
(11 in. Hg @ 115VAC /428 mbar @ 230V AC)

- Includes Power Cord, On/Off Switch, 10' flexible vacuum tubing, 5Amp Fuse, Vibration dampening feet, Easy grip handle



Front



Back

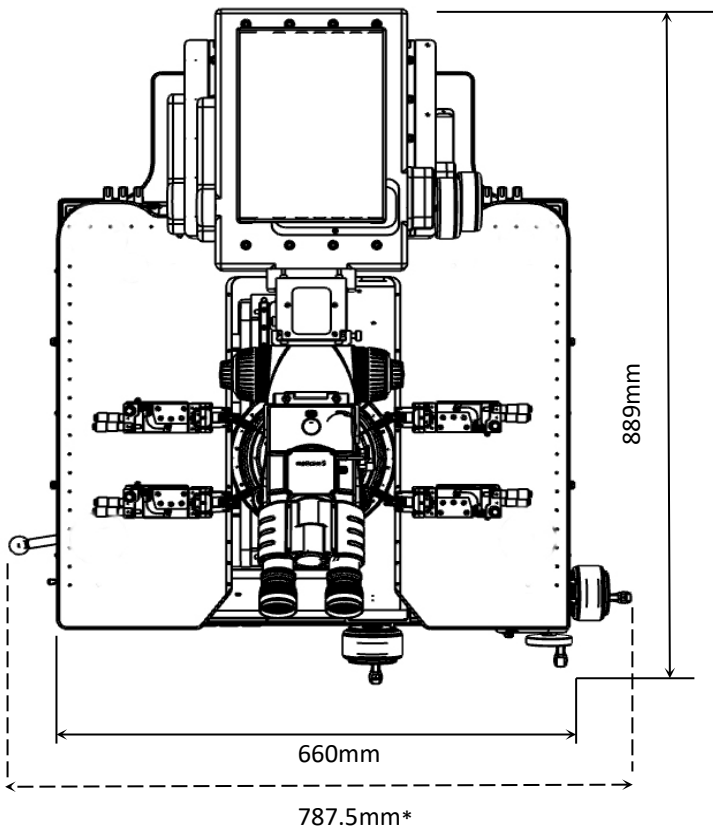
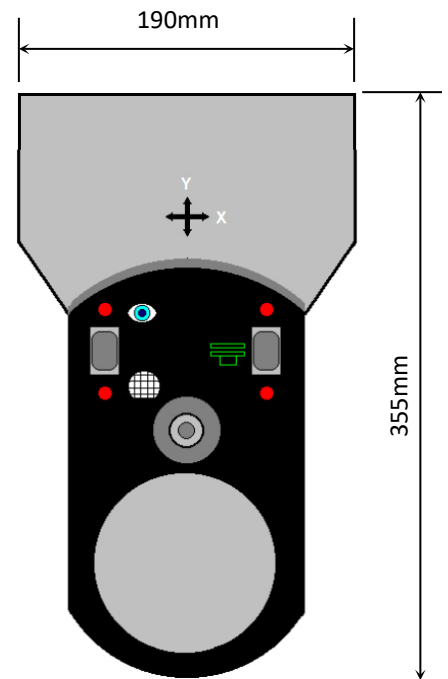
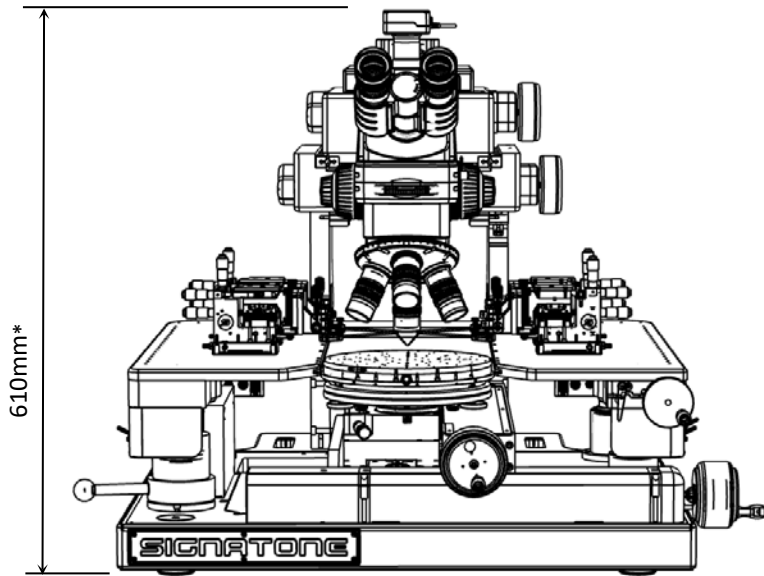
M-VAC

❖ **SYSTEM DIMENSIONS – TABLE OPTIONAL**

CM-220 / including microscope*

Dimensions (L x D x H)	660x 889 x 610mm	(26" x 35" x 24")
Weight	109kg	(240 lbs.)

* Can vary dependent on microscope selection

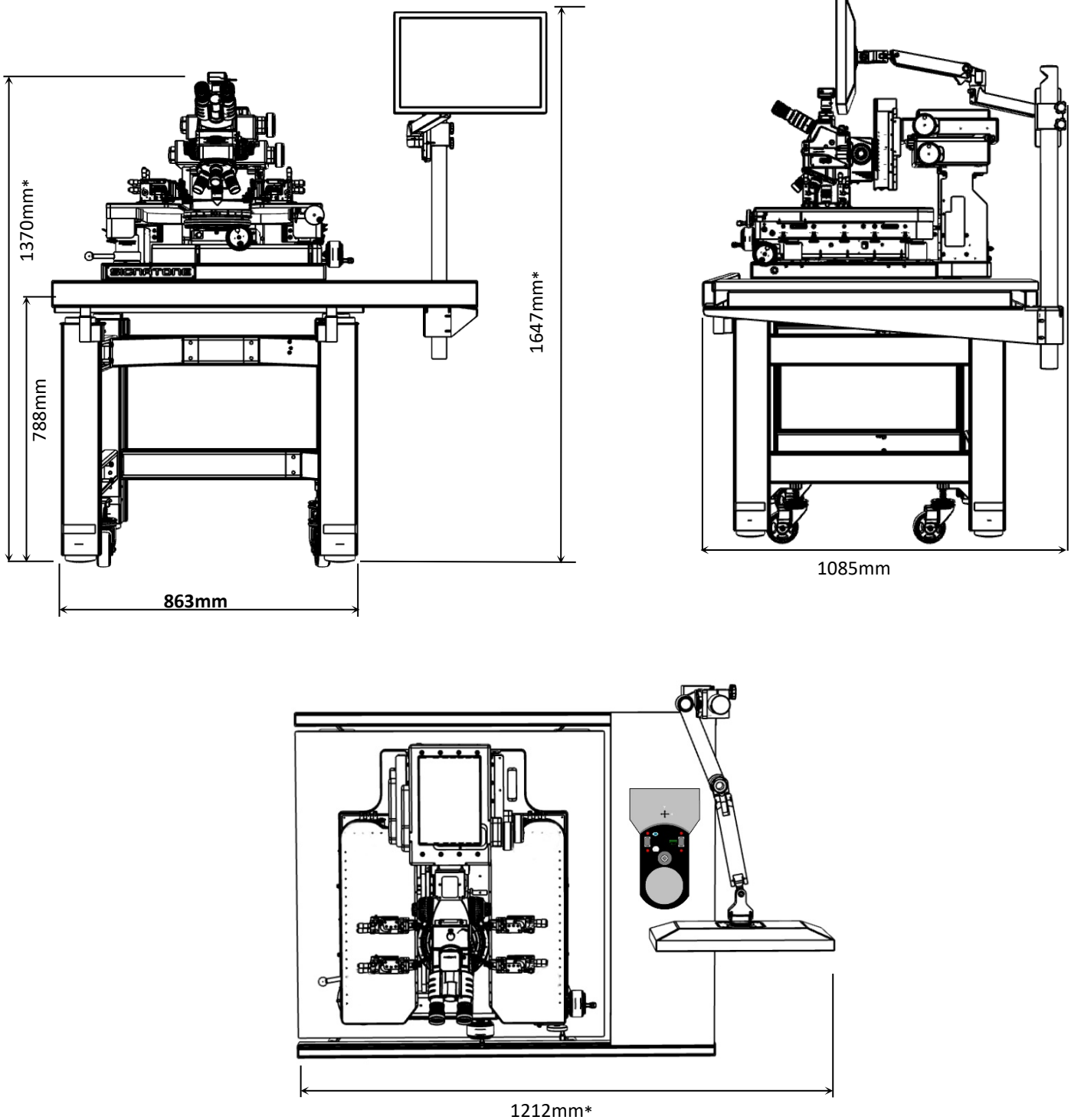


❖ **SYSTEM DIMENSIONS INCLUDING TABLE**

CM-210 / Vibration Isolation Table /Monitor Mount

Dimensions (L x D x H)	863x 1085 x 1370 mm	(34 x 42.7 x 53.95 In)
Weight	385 kg	(849 lbs.)

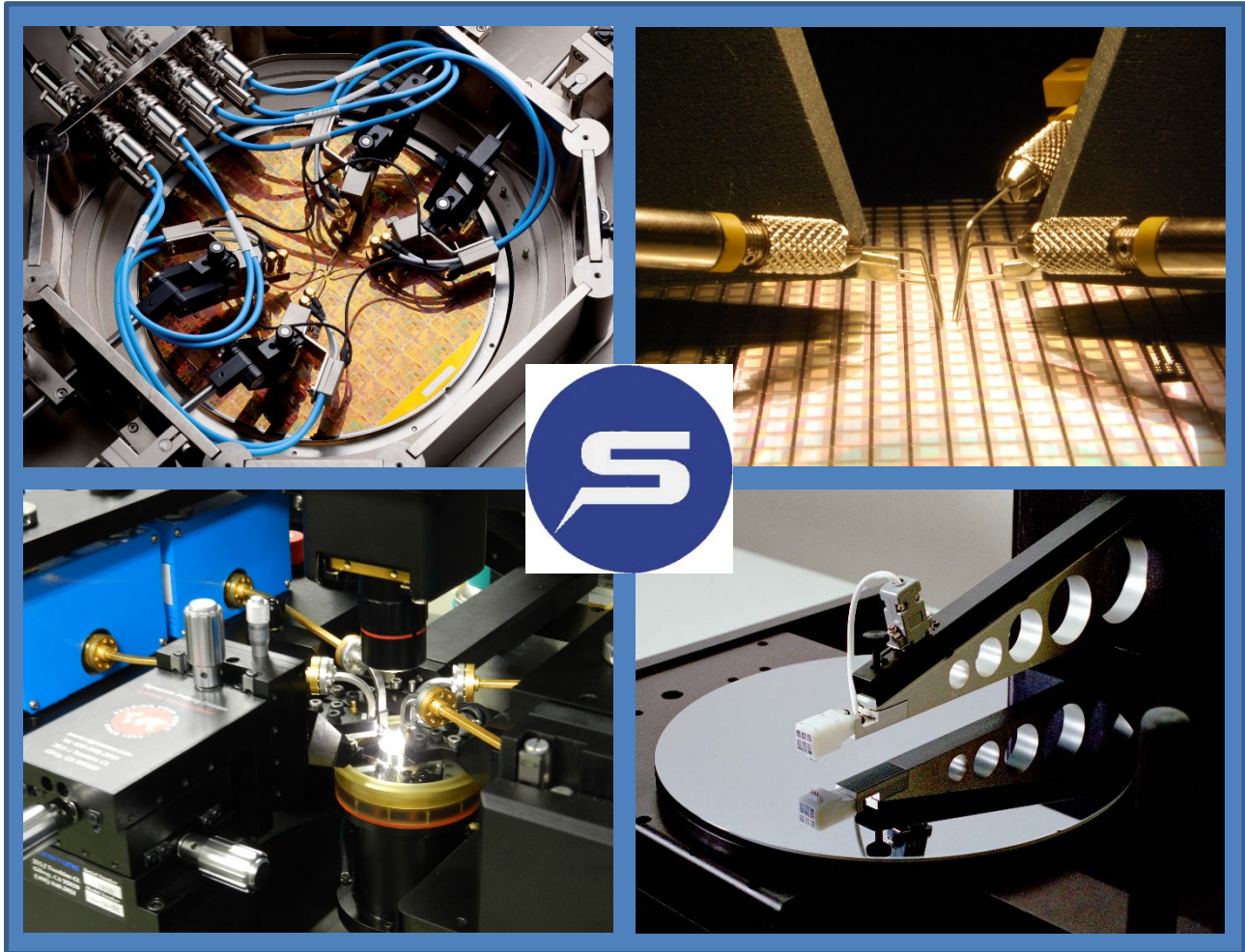
* Can vary dependent on monitor, Microscope selection and position



❖ **WARRANTY**

- Standard Warranty 12 months *
- For Extended Warranty and Service Contracts : Contact Signatone Corp. for more information

* See Signatone Corporate Terms and Conditions of Sale for further details.



- North America: Sales.NA@signatone.com
- Europe: Sales.Europe@signatone.com
- Asia: Sales.Asia@signatone.com

