Signatone CM-310 300mm High Precision Manual Probe System

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
- 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*)
- Ultras 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 +200°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 +200°C (optional)

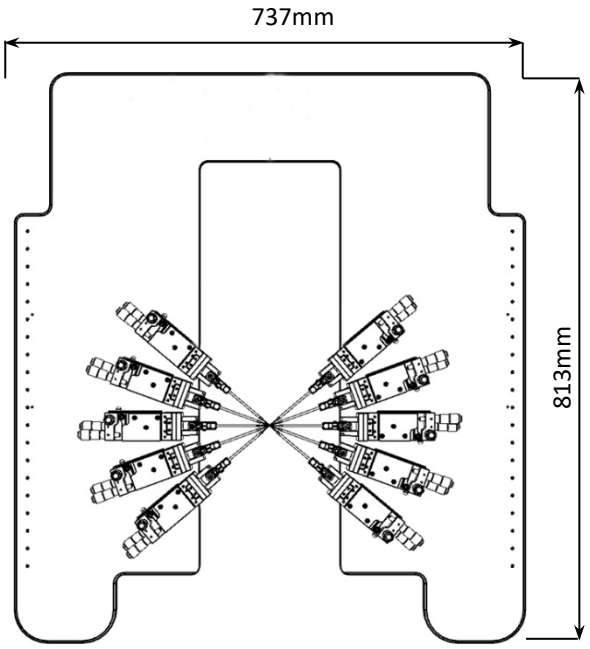
❖ SPECIFICATIONS

Chuck XY Stage (Manual)	
Travel range	308 mm x 308 mm (12.125 x 12.125 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	285mm
Presentation	285mm (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)

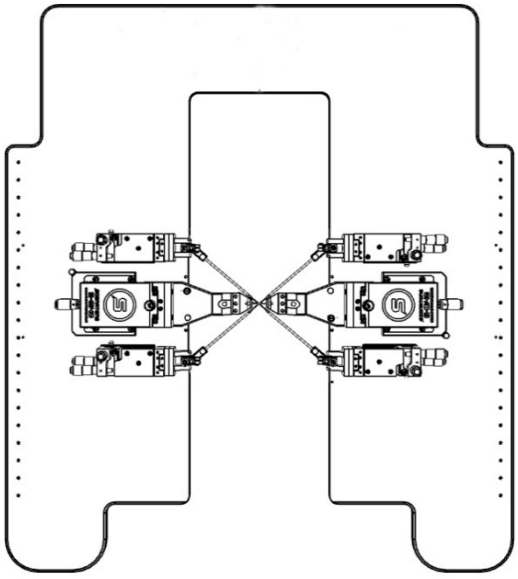
❖ PROBE PLATEN

Specifications

Material	Nickel Plated Aluminum (Steel optional)
Dimension	L = 813mm x W = 737mm x H = 12.7mm (See drawing)
Chuck to Platen Separation	Min. 2 mm (Variable Separation with Fine Platen Adjust)
Max. No of Micro Positioners	10 x DC or 2x RF + 4 x DC or a combination
Quick Platen Lift Control (CVL)	Continuous Variable Lift (0 to 3.175 mm)
Contact Repeatability	< 1 µm (0.04 mils) by Manual Control
DC MicroPositioner mounting	Magnetic or Vacuum (with Steel option)
RF MicroPositioner mounting	Magnetic or Bolt Down (with Steel option)



Sample 1: Probe Configured with 10 DC Probes

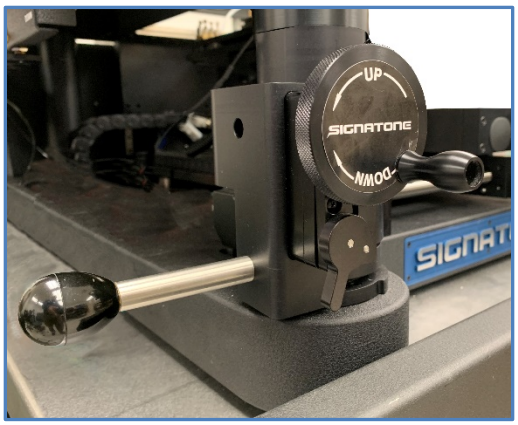


Sample 2: Probe Configured with 2 RF + 4 DC Probes

❖ ONE PLATEN - Three BENFITS

Signatone Multi Benefit /Two in One Platen 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



NON-THERMAL CHUCKS

Standard Wafer Chuck	
Connectivity	Coax BNC (m)
Diameter	308 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, 265mm
Vacuum actuation	Selector Knob allows individual activation of vacuum zones
Supported DUT sizes	25mm, 75mm, 100mm, 150mm, 200mm, 300mm
Surface planarity	±6.5µ
Rigidity	<3µ / 10N at edge of the chuck

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	308 mm
Material	Gold Plated Brass
Chuck surface	Independent Vacuum zones with vacuum rings
Vacuum hole pattern sections(diameter)	0mm, 65mm, 112mm, 162mm, 265mm
Vacuum actuation	Multi-Zone Adjustable Control
Supported DUT sizes	3mm, 75mm, 125mm, 200mm, 300mm
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

❖ SIGNATONE THERMAL CHUCKS

Typical Specifications of *Signatone* Thermal Technology

	300mm Standard Hot	300mm Hot/ Triax	300mm 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)	HV 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 & TCP/TCIP	RS232C & TCP/TCIP	RS232C & TCP/TCIP
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, 200,300mm	2, 50, 100, 150, 200,300mm	2,50, 100, 150, 200, 300mm

*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

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 ultra 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

	High Voltage Probes			High Current Probe
Model	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

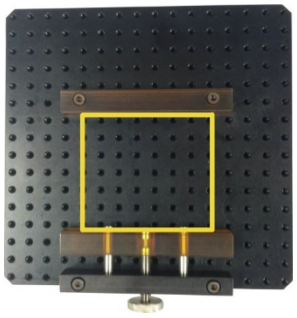
PSDB-CM

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)

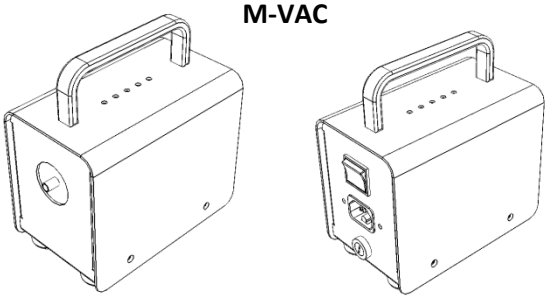


CM-BMVC

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

M-VAC



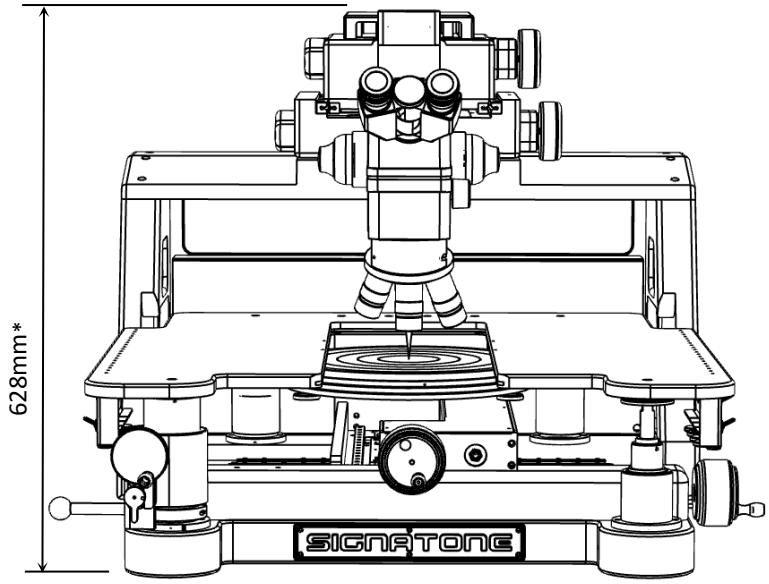
Front **Back**

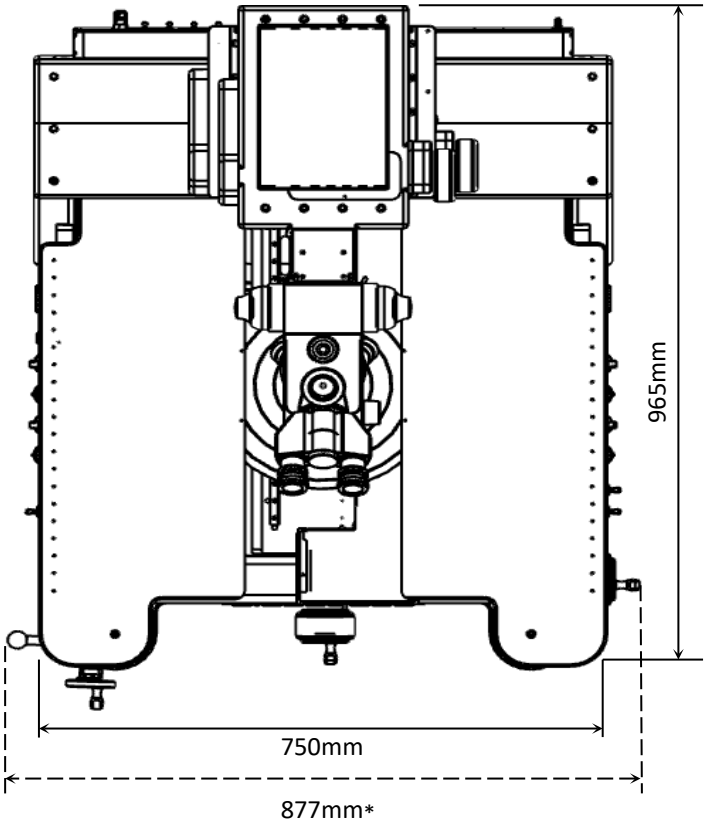
❖ SYSTEM DIMENSIONS – TABLE OPTIONAL

CM-310 / including microscope*

Dimensions (L x D x H)	750x 965 x 628mm	(30" x 38" x 25")
Weight	145kg	(320 lbs.)

** Can vary dependent on microscope selection*



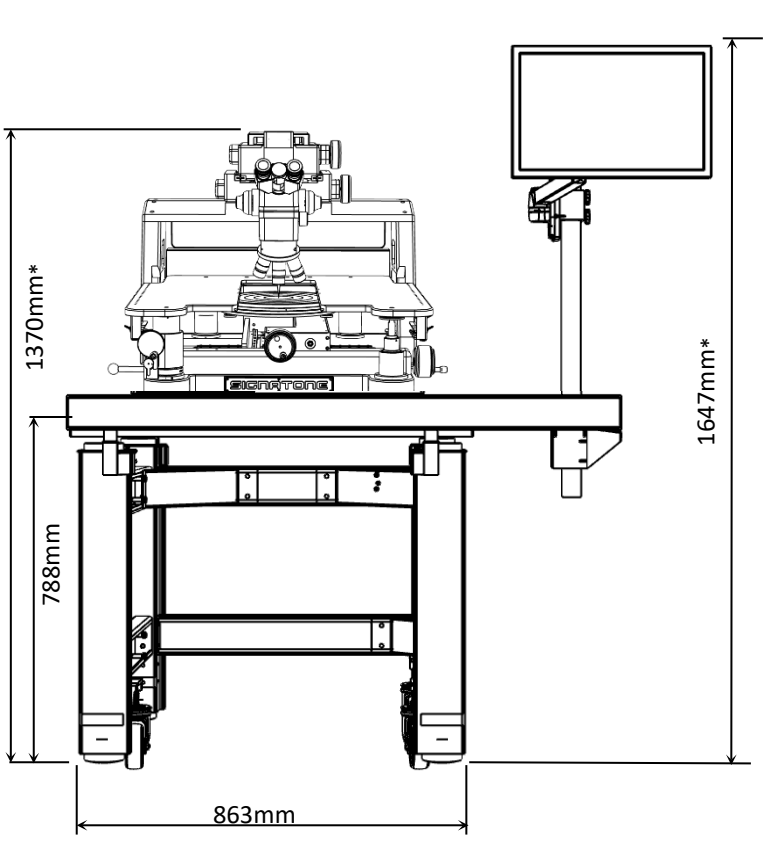


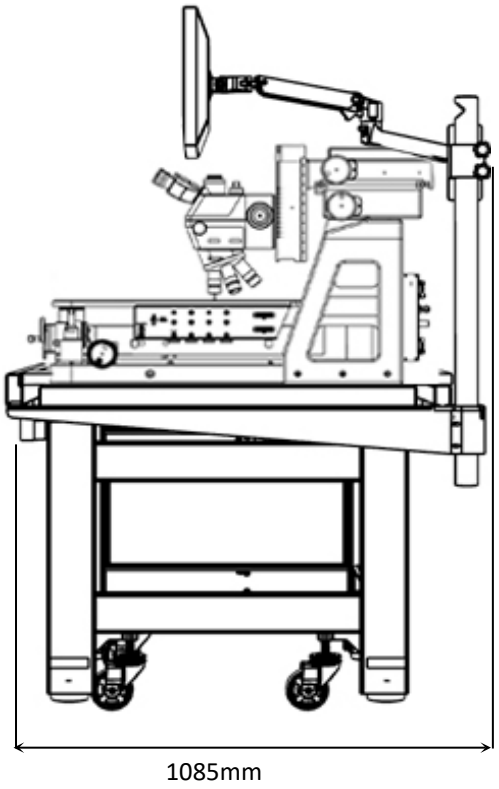
❖ SYSTEM DIMENSIONS INCLUDING TABLE

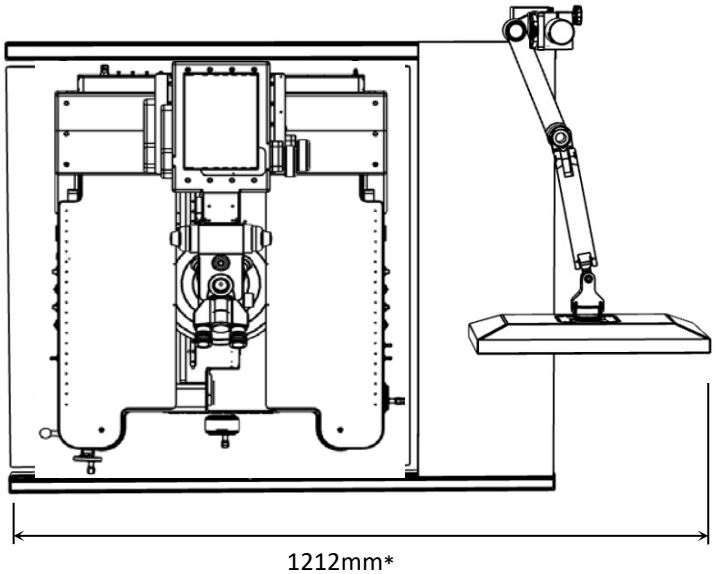
CM-310 / Vibration Isolation Table /Monitor Mount

Dimensions (L x D x H)	863x 1085 x 1370 mm	(34 x 42.7 x 53.95 In)
Weight	422 kg	(940 lbs.)

** Can vary dependent on monitor, Microscope selection and position*



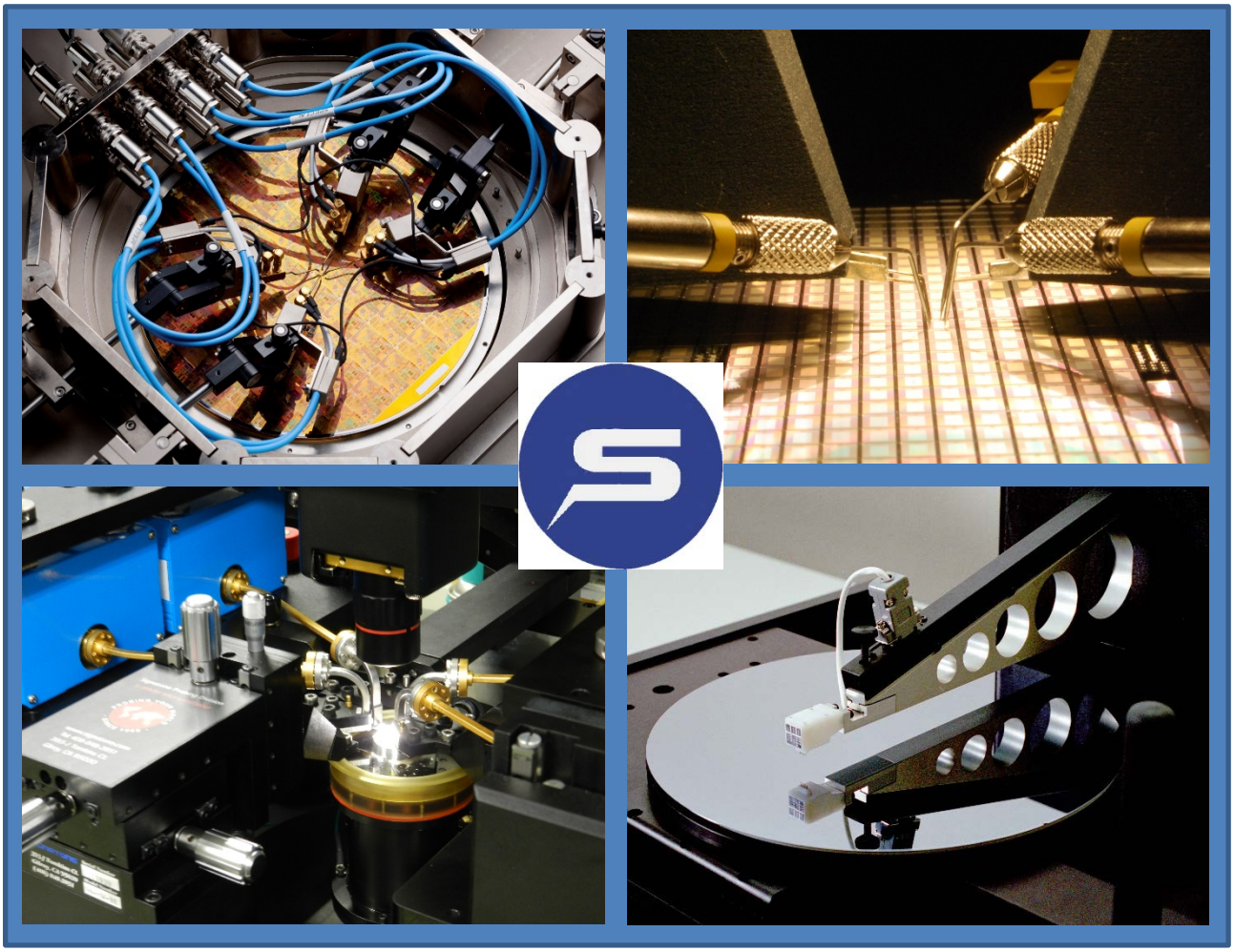




❖ WARRANTY

- 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.***



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