

# Signatone WL-170 200 mm Precision Manual Probe System For Reliable, Accurate RF/ DC/CV, and High-Power Test Measurements

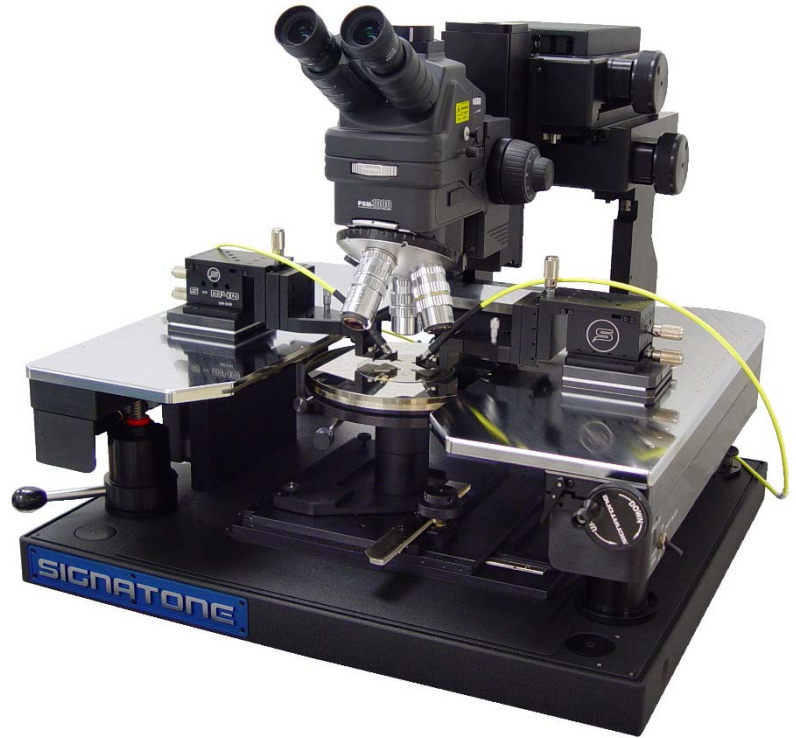
## ❖ FEATURES / BENEFITS

### Designed for a Variety of On-Wafer Analytical Measurement Applications

- RF applications up to 110GHz 2 & 4 port setup
- Upgradable for mmW 110GHz -1.5THz 2-Port
- DC, CV/IV, pulsed -IV applications
- High Power Application up to 12KV /600A
- IC Design / test verification Ambient, +300°C

### Ergonomics and Optional Configurations

- Ease of use / single-handed X-Y Stage knobs for quick movement (fine knob control\*)
- Quick platen lift with adjustable platen separation
- Chuck rotation
- Chuck fine rotation and lock\*
- Available in multiple configurations including a variety of chuck options, DC/RF/High Power Micro positioners, microscopes, camera's, PCB holders, and more.
- Optional Instrumentation racks, Vibration Isolation tables, Thermal chuck, and more.



## ❖ SPECIFICATIONS

### Chuck XY Stage (Manual)

Travel Range (Standard)	203 mm x 203 mm (8" x 8")
Travel Resolution (Standard)	75 µm Per Degree of Knob Rotation
Travel Range (Fine)*	12mm x 12mm (0.5" x 0.5")
Travel Resolution (Fine)*	<1µm (0.001mm) @ 250µm/rev
Drive Mechanism	Coaxial Knob Gear Drive Stage

### Chuck To Platen (Manual Adjust)

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

\*Optional items

❖ **SPECIFICATIONS**

**Chuck Theta Stage (Manual)**

Theta Travel (Standard)	360°
Theta Travel (Fine)*	± 6.0°
Theta Resolution	1.5 x 10 <sup>-5</sup> gradient
Repeatability	< 1.5 µm
Theta Stage Drive	High Resolution Lead Screw

**Manual Microscope Stage (linear)**

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

❖ **ONE PLATEN x 4 BENEFITS**

**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)



Platen “Quick Lift”



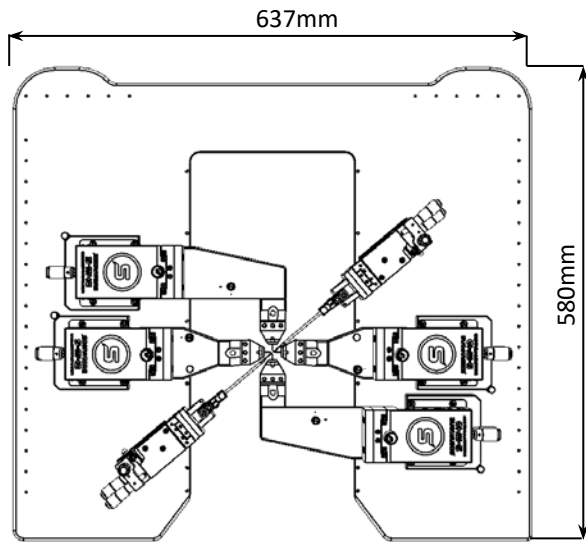
Platen “Fine Adjust” and  
“Position Lock”

\*Optional items

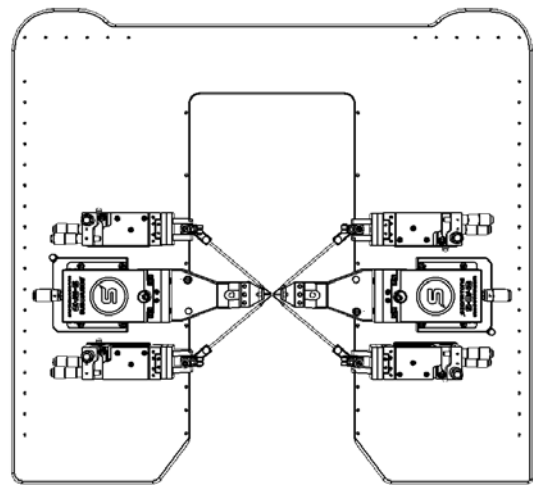
❖ **PROBE PLATEN**

**Specifications**

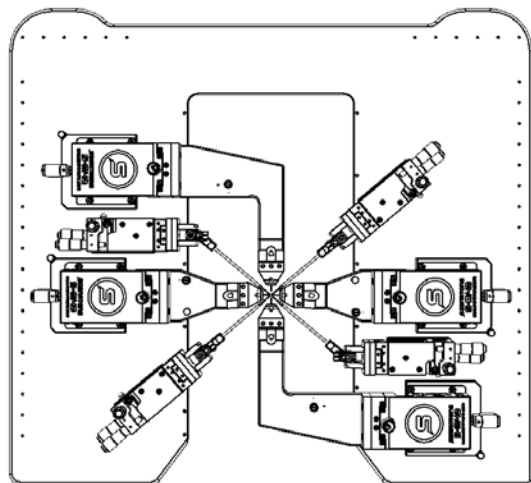
Material	Nickel Plated Steel (Al optional)
Dimension	L = 580mm x W = 637mm x H = 12.7mm (See drawing)
Chuck to Thermal Shield Separation	Min. 2 mm (Variable Separation with Fine Platen Adjust)
Max. No of Micro Positioners	4x RF + 2x DC or 2x RF + 4x DC or 4x RF + 4x DC or 10x DC
Quick Platen Lift Control (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



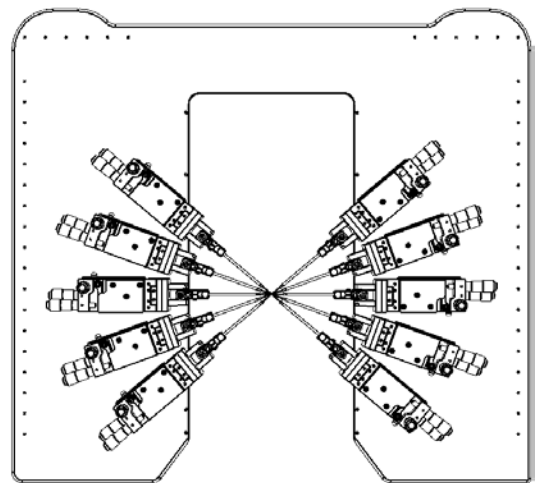
Sample1: Probe Configured with 4 RF + 2 DC Probes



Sample2: Probe Configured with 2 RF + 4 DC Probes



Sample3: Probe Configured with 4RF + 4 DC Probes



Sample4: Probe Configured with 10 DC Probes

❖ **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

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

❖ **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

**❖ RF PROBE –SELECTION GUIDE**



**Cable Interface**

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



**Calibration Substrates**

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

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

<b>GSG &gt; 110GHz</b>	<b>SP-CS-15</b>
Pad Size	25μ X 25μ
Pitch Range	40μ - 150μ (SOLT) 30μ - 150μ (LRM)



**RF Cables**

	<b>RFC-40</b>	<b>RFC-50</b>	<b>RFC-67</b>	<b>RFC-110</b>
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

❖ **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

**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 circular patterns
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**

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**

	<b>200mm Standard Hot</b>	<b>200mm Hot/ Triax</b>	<b>200mm Hot/ 3kV Triax</b>
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 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 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

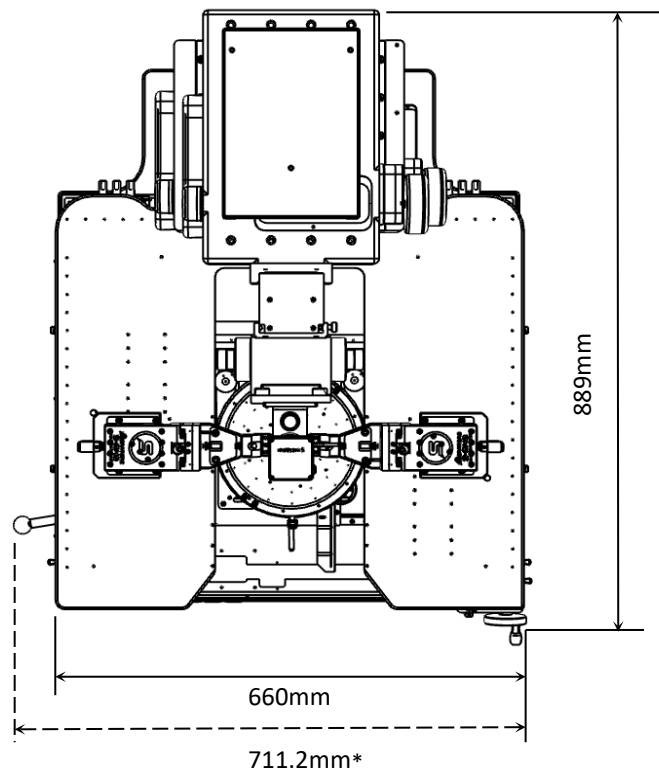
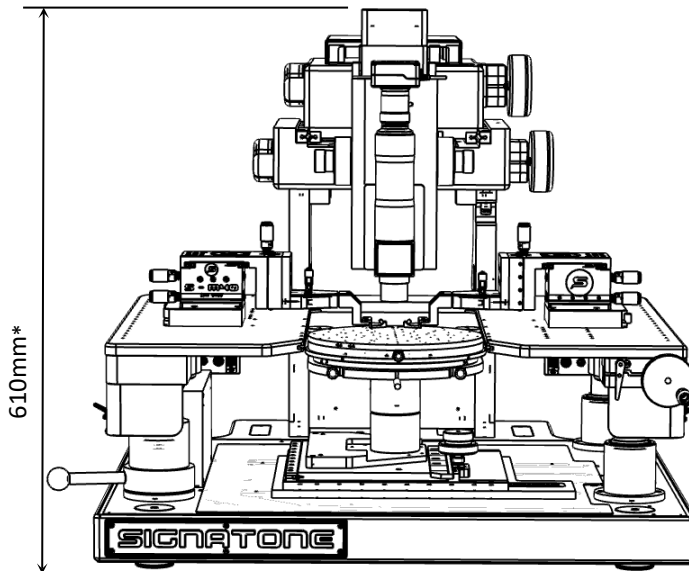
\*All data relevant for chucks in ECO mode

❖ **SYSTEM DIMENSIONS – TABLE OPTIONAL**

**WL-170 / including microscope\***

Dimensions (L x D x H)	660x 889 x 610mm	(26" x 35" x 24")
Weight	100kg	(220.5 lbs.)

\* Can vary dependent on microscope selection

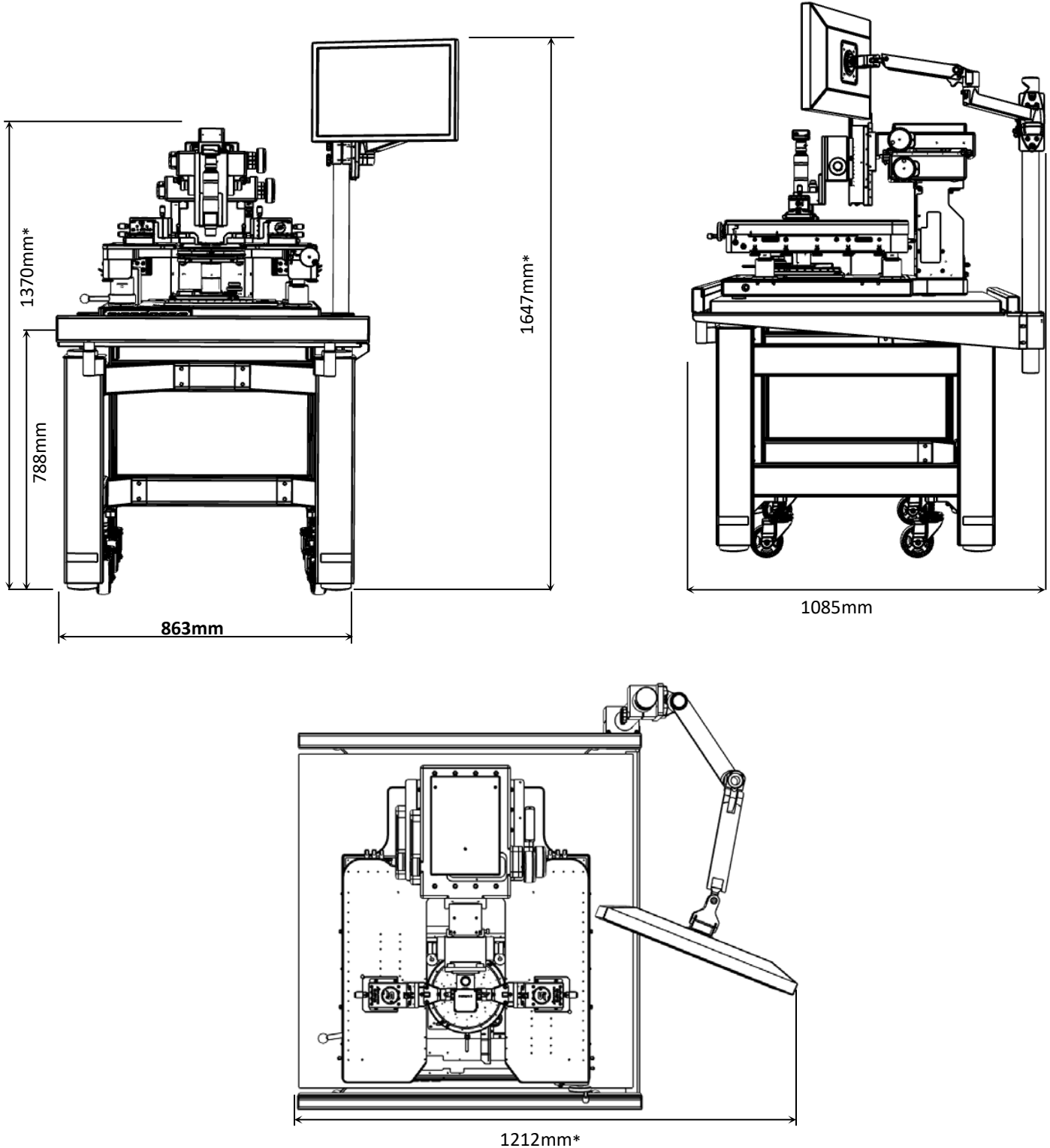


❖ **SYSTEM DIMENSIONS INCLUDING TABLE**

**WL-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.)

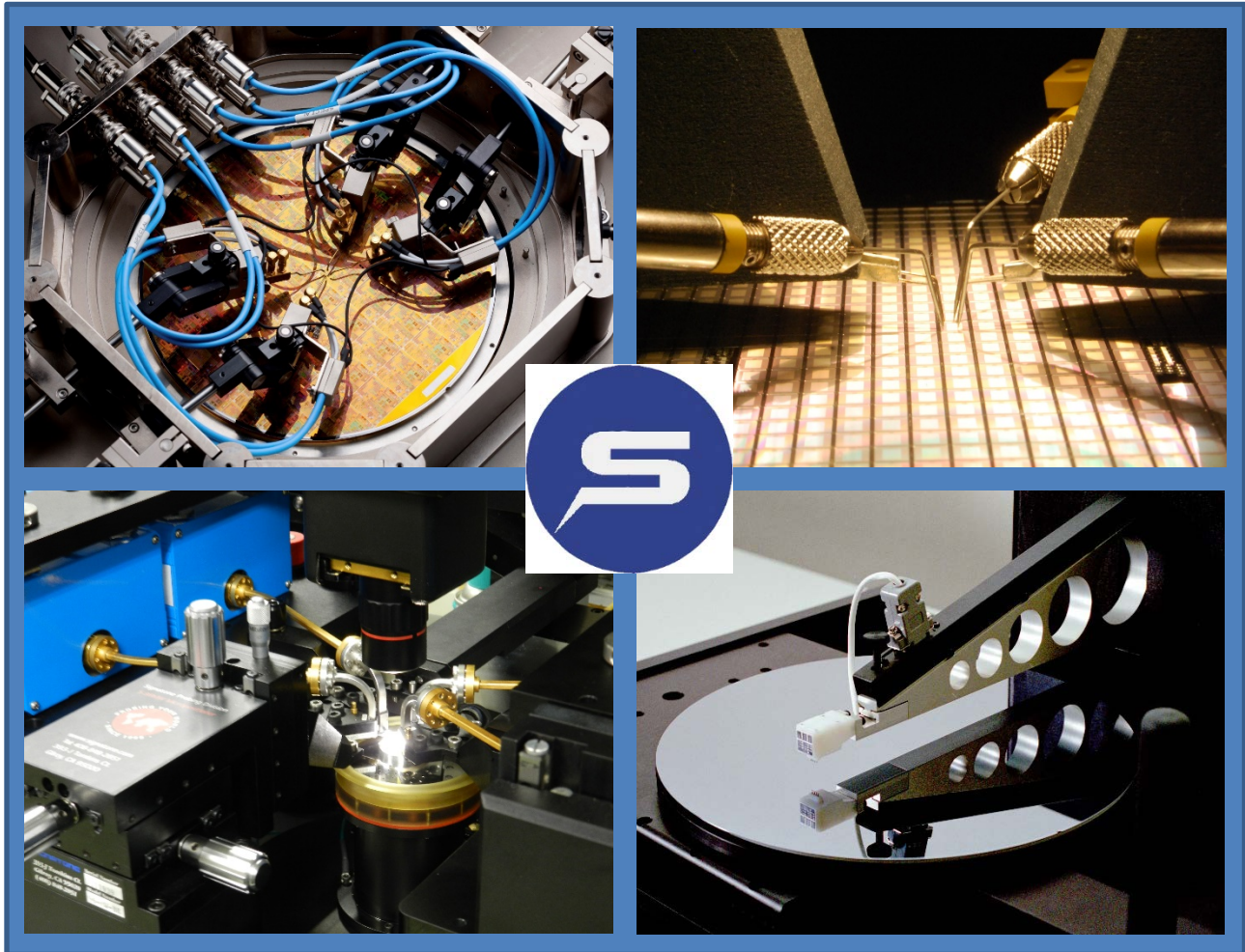
\* Can vary dependent on monitor, Microscope selection and position



❖ **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](mailto:Sales.NA@signatone.com)
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