

# Signatone WL-210-LE 200 mm Manual Probe System with Local Enclosure for reliable and accurate DC/CV, RF and mmW measurements

## ❖ FEATURES / BENEFITS

### Multi – Use

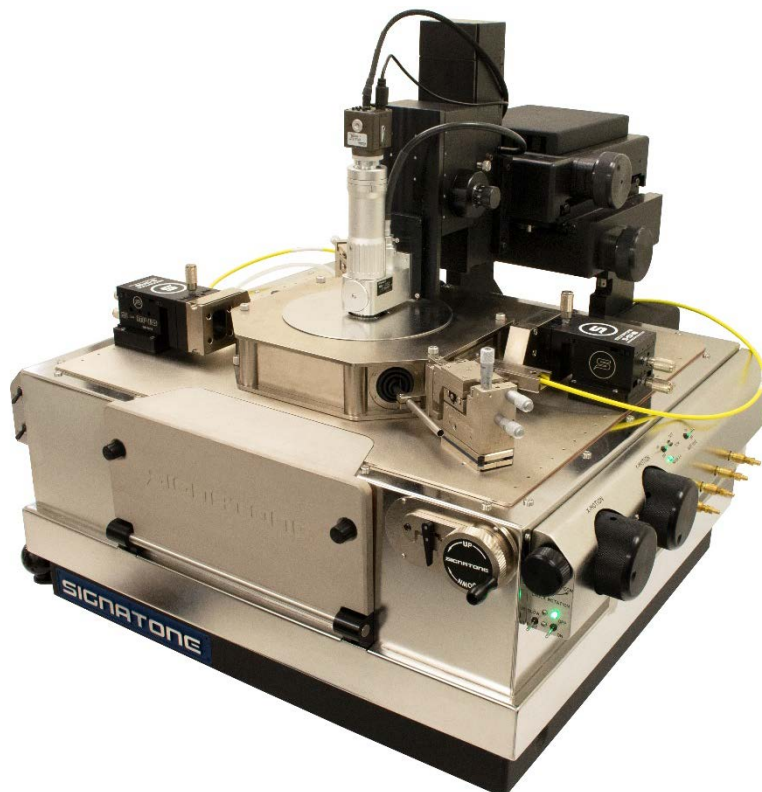
- Designed for a wide variety of applications including: Failure Analysis, RF and mmW wafer Level Reliability and Device Characterization.

### Local Enclosure for Accurate Measurements

- Designed for advanced EMI / RFI / Light-Tight Shielding.
- FemtoAmp low-leakage abilities
- Accepts Temperatures: -60 °C to +300 °C

### Ergonomics and Optional Configurations

- Easy use of X-Y Stage knobs located in the front –right side of the prober. (away from thermal chuck)
- Available in multiple configurations including a variety of chuck options, DC/RF/mmW Micro positioners, microscopes, camera's, lasers for various applications
- Local enclosure included in system configuration



## ❖ SPECIFICATIONS

### Chuck XY Stage (Standard)

Travel range	200 X 200 mm (8 x 8 in)
Fine-travel range	0.1 μm (3.94 x 10 <sup>-7</sup> mils) @ 204.8μm/rev
Fine-travel resolution	1μm (4 X 10 <sup>-5</sup> mils) @ 2048μm/rev
Planarity	< 10 μm
Theta travel (course speed)	± 6° 1.5 x 10 <sup>-4</sup> gradient
Theta travel (fine Speed)	± 6° 1.5 x 10 <sup>-5</sup> gradient
Theta resolution	1.5 x 10 <sup>-5</sup> gradient
Movement	Lead Screw

### Chuck Z Stage

Travel range	2.5mm (.01 in)
Z Stage drive	Pneumatic Precision Lift
Chuck to Platen Separation (Quick Lift)	3.175mm (1/8")
Chuck to Platen Separation (Fine Adjust)	38.1mm (1.5")

### Manual Microscope Stage (Linear)

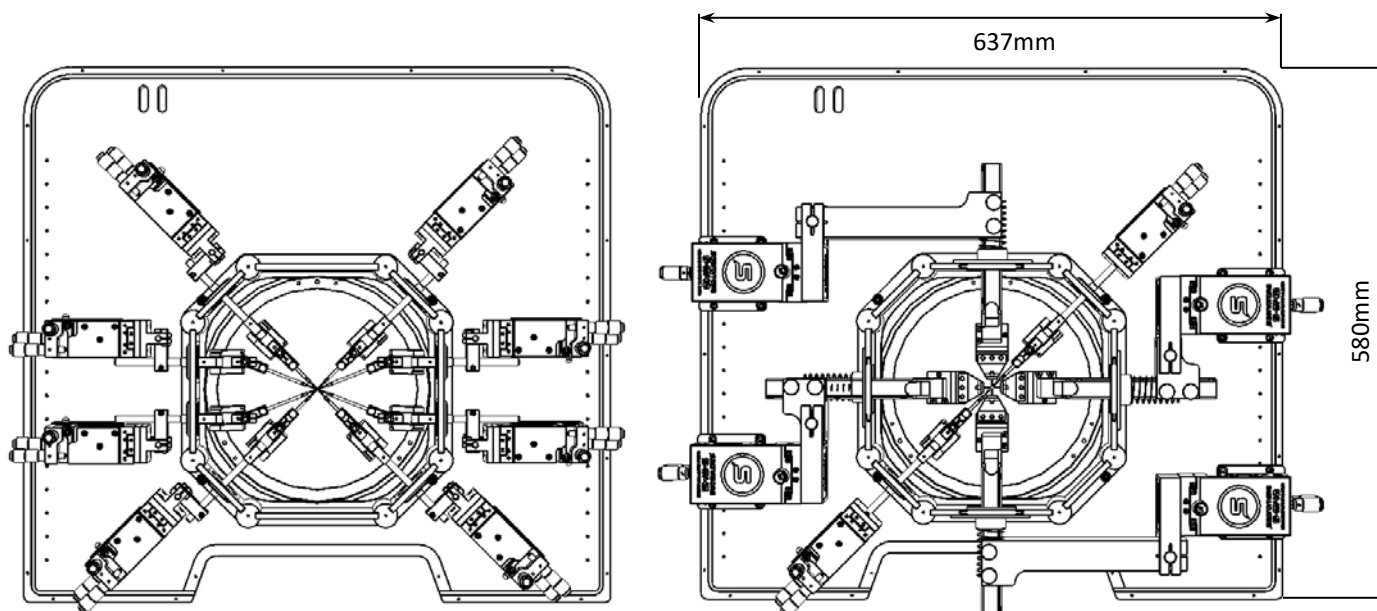
Movement range	50 X 50 mm (2 x 2 in)
Resolution	< 2µm (2 X 10 <sup>-4</sup> mils)
Scope lift	101 mm (4 in) vertical Pneumatic (Manual-optional)

## ❖ 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	8x DC or 4x DC + 2x RF or 2x DC + 4x RF or 4x DC + 4x RF
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

Universal Platen Designed for Multiple Probe Configurations



Sample Probe Configured with 8 DC Probes

Sample Probe Configured with 4 RF + 2 DC Probes

❖ **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”

❖ **Local Enclosure**

Signatone’s Local Enclosure is a high performance environmental chamber that provides an excellent EMI shielded and light-tight environment for low noise and low capacitance measurements. Local Enclosure accommodates 4-port RF or 8-ports DC/Kelvin and connector panel or a combination of RF/DC. The Signatone “Top Hat” provides for easy reconfiguration of Micro positioners, cables, connectors and additional customer defined fixtures allowing multiple setups while maintaining ease of use

**Local Enclosure 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)

❖ **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



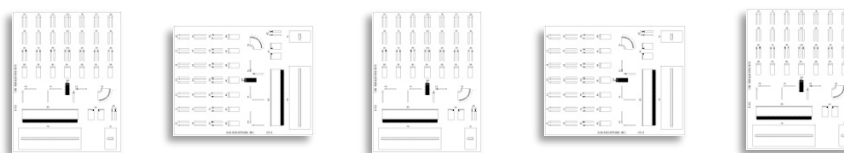
HCP-100

**❖ 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>
<b>Frequency Range</b>	DC - 40GHz	DC - 50GHz	DC - 67GHz	DC - 110GHz
<b>Length</b>	4 Ft.	4 Ft.	3 Ft.	*
<b>Connectors</b>	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
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 (f)
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**

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

**Typical Specifications of Signatone Thermal Technology**

<b>Nominal Description</b>	<b>200mm Standard Hot</b>	<b>200mm Hot/Cold Triax</b>	<b>200mm Hot/Cold 3kV Triax</b>
Temperature Range	+25 °C to +300 °C	-60 °C to +200 °C	-60 °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	HFE	HFE
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)	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	25 to -55°C < 24min	25 to -55°C < 50min
Leakage @ 10 V Kelvin Triax (m)	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, 200	2, 50, 100, 150, 200

➤ **THERMAL SYSTEM FACILITY REQUIREMENTS**

Thermal chuck controller, electrical	<b>S1080A</b>	<b>S1080C</b>	<b>S1080C</b>
Voltage	208-240V A/C	208-240V A/C	208-240V A/C
Frequency	50/60Hz	50/60Hz	50/60Hz
Peak Watts	1400	1400	1400
Chiller electrical	<b>TCII</b>	<b>FP89-HL 60Hz</b>	<b>FP89-HL 60Hz</b>
Voltage	110-120V A/C	220-230V A/C	220-230V A/C
Frequency	60Hz	60Hz	60Hz
Peak Watts	1000	2850	2850
Chiller electrical	<b>TCII-220</b>	<b>FP89-HL 50Hz</b>	<b>FP89-HL 50Hz</b>
Voltage	215-240V A/C	215-240V A/C	215-240V A/C
Frequency	50Hz	50Hz	50Hz
Peak Watts	1000	3000	3000

➤ **POWER REQUIREMENTS (PROBE STATION)**

	Voltage / Watts	
	115V 60Hz	230V 50Hz
General Probe System	100W	100W
Optical Accessories	200W	200W
M-VAC (vacuum pump)	14W	15W
Camera System (with Monitor)	183W	183W



## STANDARD ERS THERMAL CHUCKS

### Specifications of ERS Technology 200mm Chucks

Temperature Range	-10 °C to 200 °C	-40 °C to 200 °C	-60 °C to 200 °C
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 surface plating	Nickel plated with pinhole surface	Nickel plated with pinhole surface	Nickel plated with pinhole surface
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	< ±0.5 °C at ≤ 200 °C	< ±0.5 °C at ≤ 200 °C
Surface flatness and base parallelism	< ±10 µm	< ±10 µm	< ±10 µm
Electrical isolation-Coax BNC (f)	N/A	N/A	N/A
<b>Heating Rates</b>			
25 °C	-10 to 25 °C < 5 min	-40 to 25 °C < 8 min	-60 to 25 °C < 10 min
200 °C		25 to 200 °C < 15 min	
<b>Cooling Rates*</b>			
200 °C		200 to 25 °C < 12 min	
25 °C	25 to -10 °C < 12 min	25 to -40 °C < 18 min	25 to -60 °C < 25 min
Isolation	> 10 TΩ at 25 °C > 2.5 TΩ at 200 °C > 2.5 TΩ at -10 °C	> 10 TΩ at 25 °C > 2.5 TΩ at 200 °C > 2.5 TΩ at -40 °C	> 10 TΩ at 25 °C > 2.5 TΩ at 200 °C > 2.5 TΩ at -60 °C
Capacitance	N/A	N/A	N/A
Maximum voltage between chuck top and GND	500 V DC	500 V DC	500 V DC

\*All data are relevant for chucks in ECO mode

### System Controller / Chiller Dimensions and Power / Air Consumption

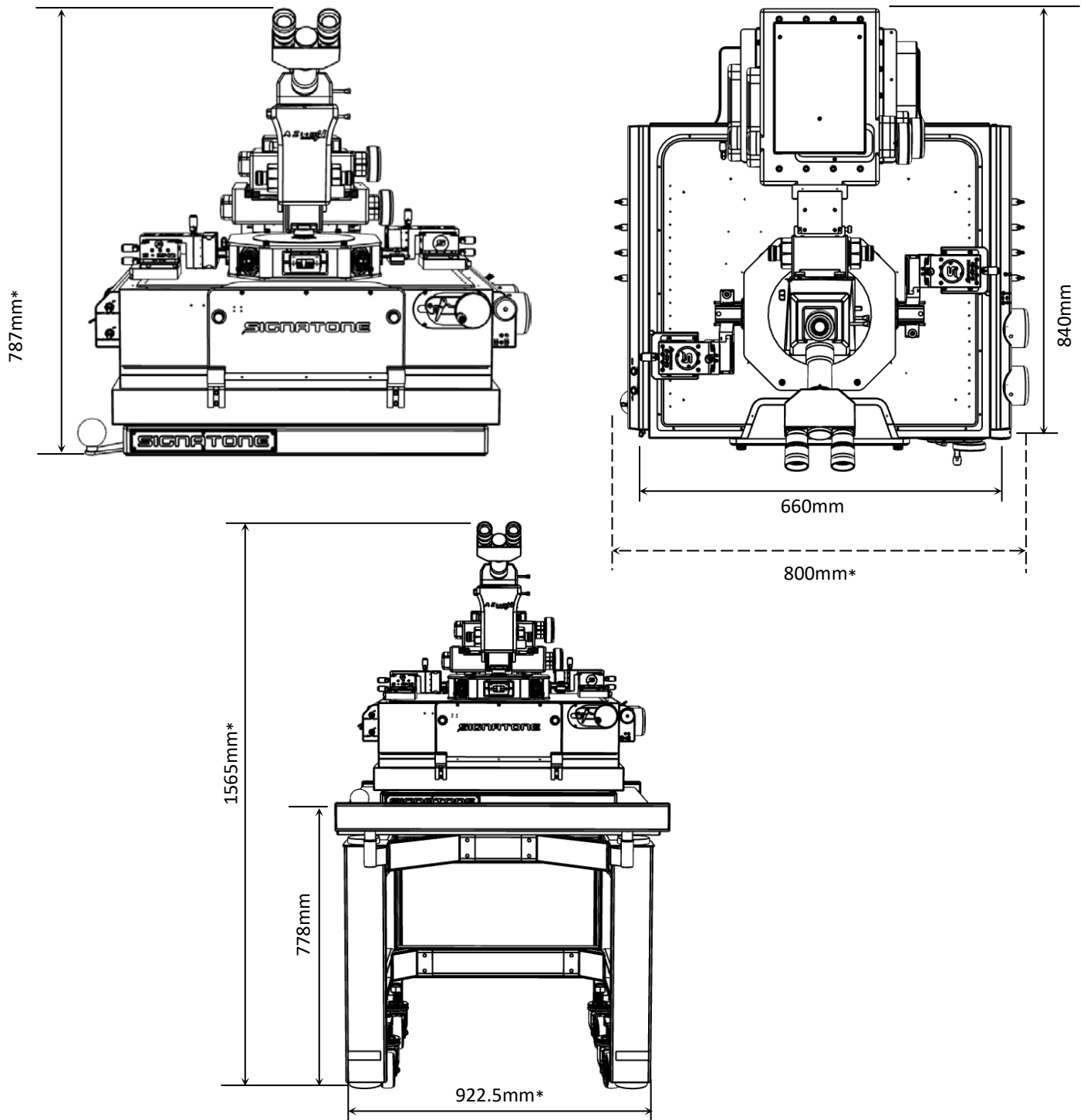
System type	W x D x H (mm)	Weight (kg)	Power cons. (VA)	max. Air flow (l/min)
20 to 200 °C / 300 °C	300 x 360 x 140	12	1000	200
-10 to 200 °C / 300 °C	420 x 355 x 450	50	1650	250
-40 to 200 °C / 300 °C	420 x 500 x 1020	140	2400	400
-60 to 200 °C / 300 °C	420 x 500 x 1020	140	2400	400

❖ **SYSTEM DIMENSIONS – TABLE OPTIONAL**

**WL- 210-LE / including microscope\* (Not including Table)**

Dimensions (L x D x H)	660 x 840 x 787mm	(26" x 33" x 31")
Weight	140.6kg	(310 lbs.)

\* Can vary dependent on monitor, probes, shelf, and microscope selection



## ❖ WARRANTY

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- 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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