

# Summit

## 200 mm Semi-automatic Probe System



### DATA SHEET

Summit™ series measurement platforms, with PureLine™ and AttoGuard® technology, allow you to access the full range of your test instruments for 200 mm and 150 mm wafers. Whatever your application: RF/Microwave, device characterization, wafer-level reliability, e-test, modeling, or yield enhancement, Summit series platforms lead the industry in on-wafer measurements. Summit series probe stations are easy to configure with your choice of measurement performance, chuck size, thermal range and microscope options. All platforms are -60°C to 300°C compatible to ensure an upgrade path to meet your future needs. Cascade Microtech provides many accessories for the Summit platform for a wide range of applications to suit your unique test needs.

### FEATURES / BENEFITS

|  |  |
|--|--|
| Measurement accuracy                           | Best solution for low-noise and 1/f measurements with advanced PureLine, AutoGuard and MicroChamber® technologies<br>Minimize AC and spectral noise with effective shielding capability  |
| Positioning accuracy                           | Precision linear-motor/ air-bearing stage for accurate positioning with temperature compensation<br>Precision sub-micron stepping with auto XYZ and theta correction   |
| Productivity                                   | Unattended testing over multiple temperatures with VueTrack™ technology and High-Temperature Stability (HTS) enhancement<br>eVue™ digital imaging system with enhanced optical visualization, fast set-up, and in-die and wafer navigation<br>Powerful automation tools, such as automatic die-size measurements and wafer alignment |
| Flexibility and application-tailored solutions | RF/microwave device characterization, 1/f, WLR, FA and design debug<br>Complete solution for small- and large-area multi-site probe cards  |
| Ease of use                                    | “Hands-free” microscope remote control, arm rest, and quick-access control panel<br>Quick and comfortable wafer access via locking roll-out stage  |

## MECHANICAL PERFORMANCE

### X-Y Stage (Summit 12000B Semi-automatic)

|                    |   |
|--------------------|---|
| Travel             | 203 mm x 203 mm (8 in. x 8 in.)   |
| Resolution         | $\pm 1 \mu\text{m}$ (0.04 mils)   |
| Repeatability      | $\leq 2 \mu\text{m}$ (0.08 mils)  |
| Accuracy           | $\leq 2.5 \mu\text{m}$ (0.1 mils)   |
| Speed              | $> 50 \text{ mm/sec}$ (2 in./sec)   |
| Bearings           | Precision linear cross-roller   |
| Motor-drive system | 5-phase stepper motor   |
| Feedback system    | 1 $\mu\text{m}$ resolution closed-loop optical linear encoder                                     |
| Move time          | $\leq 750 \text{ ms}$ (200 $\mu\text{m}$ Z down – 1000 $\mu\text{m}$ XY – 200 $\mu\text{m}$ Z up) |

### Z Stage (Summit 12000B Semi-automatic)

|                        |  |
|------------------------|--|
| Travel                 | 5 mm (0.19 in.)  |
| Resolution             | 1 $\mu\text{m}$ (0.04 mils)                                |
| Repeatability          | $\leq 1 \mu\text{m}$ (0.04 mils)                           |
| Accuracy               | $\leq 2 \mu\text{m}$ (0.08 mils)                           |
| Probe-force capability | 20 kg (44 lb.) maximum                                     |
| Probe-force deflection | $\leq 0.0015 \mu\text{m}/\mu\text{m}$ slope per 10 kg load |

### Theta Stage (Summit 12000B Semi-automatic)

|               |   |
|---------------|---|
| Travel        | $\pm 5.5^\circ$   |
| Resolution    | 0.65 $\mu\text{m}$ (0.03 mils)*   |
| Repeatability | $\pm 2 \mu\text{m}$ (0.08 mils)*  |
| Accuracy      | $\pm 2 \mu\text{m}$ (0.08 mils)* standard moves, $\pm 3 \mu\text{m}$ (0.12 mils)* large moves |

\* Measured at edge of 200mm chuck

### X-Y Stage (Summit 11000B Manual)

|            |                                 |
|------------|---------------------------------|
| Travel     | 203 mm x 203 mm (8 in. x 8 in.) |
| Resolution | 5 mm / turn                     |
| Bearings   | Precision cross-roller          |

### Z Stage (Summit 11000B Manual)

|                        |  |
|------------------------|--|
| Type                   | Fixed Z mount  |
| Probe-force deflection | $\leq 0.0015 \mu\text{m}/\mu\text{m}$ slope per 10 kg load |

### Theta Stage (Summit 11000B Manual)

|            |                 |
|------------|-----------------|
| Travel     | $\pm 5.7^\circ$ |
| Resolution | 0.8° / turn     |

## PHYSICAL DIMENSIONS

### Station Platform

|                             |   |
|-----------------------------|---|
| Station dimensions          | 76 cm (W) x 68 cm (D) x 45 (H) (30 in. x 27 in. x 18 in.) |
| Typical height to eyepieces | 58 cm (23 in.)  |
| Net weight                  | 165 kg (364 lb.)  |

## MICROCHAMBER

| Electrical (Semi-automatic) | Summit 12000B-AP                                     | Summit 12000B-M                                      |
|-----------------------------|--|--|
| EMI shielding               | ≥ 20 dB 0.5-3 GHz, ≥ 30 dB 3-20 GHz (typical)        | ≥ 20 dB 0.5-20 GHz (typical)                         |
| Spectral noise floor*       | ≤ -150 dBVrms/rtHz (≤ 50 kHz)                        | ≤ -150 dBVrms/rtHz (≤ 50 kHz)                        |
| System AC noise **          | ≤ 10 mVp-p (≤ 1 GHz)<br>≤ 20 mVp-p (≤ 1 GHz) THERMAL | ≤ 15 mVp-p (≤ 1 GHz)<br>≤ 20 mVp-p (≤ 1 GHz) THERMAL |

\* Typical results. Actual values depends on probe / test setup. Test setup uses triaxial thermal chuck, 50 Ω termination, high quality LNA, and DSA/DSO instrument.

\*\* Test setup: Station power ON, Thermal system ON (40°C), MicroChamber closed, guard to shield shorted with triax adapter on chuck. Instrument setup: Time domain digital scope (DC to 1 GHz), 50 Ω input impedance, cable to chuck BNC connector. Measurement: Peak-Peak Noise Voltage (acquire 1000 data points, and calculate mean of Vp-p data).

### Light Shielding

|                     |  |
|---------------------|--|
| Type                | Complete dark enclosure around chuck   |
| Wafer access        | Front access door with rollout stage for easy wafer loading  |
| Probe compatibility | Standard MicroChamber TopHat™ allows access for up to eight probes (16 with optional large TopHat) |
| Light attenuation   | ≥ 120 dB   |

### Purge and Condensation Control

|                           |  |
|---------------------------|--|
| Test environment          | Low volume for fast purge, external positioning and cable access to maintain sealed environment              |
| Dew point capability      | > -70°C for frost-free measurements*   |
| Purge gas                 | Dry air or nitrogen  |
| Purge control / flow rate | Manual control, variable 0 to 4.3 liters/sec (9 SCFM)  |
| Purge time                | < 15 min for measurements @ -55°C (typical)  |
| Condensation control      | Integrated laminar flow air distribution internal to MicroChamber and above platen to eliminate condensation |

\* Please see the facilities guide for air requirements to enable optimum dew point for low temperature measurements using a thermal chuck inside the MicroChamber.

## PLATEN SYSTEM

### Platen

|                         |  |
|-------------------------|--|
| Material                | Steel for magnetic positioners   |
| Dimensions              | 74.5 cm (W) x 59.5 cm (D) x 20 mm (T) (29.3 in. x 23.4 in. x 0.78 in.)                     |
| Mounting system         | Kinematic 4 point  |
| Platen to chuck height  | 14 ± 0.5 mm (0.55 ± 0.02 in.)  |
| Accessory compatibility | Minimum of 8 DC or 4 RF positioners allowed, compatible simultaneous probe card holder use |
| Thermal management      | Integrated laminar-flow air-cooling for thermal expansion control                          |

## PLATEN SYSTEM (CONTINUED)

### Platen Ring Insert

|                    |  |
|--------------------|--|
| Material           | Steel for magnetic positioners                                   |
| Weight             | 4.5 kg (9.9 lb.)   |
| Standard interface | For MicroChamber, TopHat, probe card holders and custom adapters |

### Platen Lift

|               |  |
|---------------|--|
| Type          | Precision 4-point linear lift  |
| Range         | 5.0 mm (0.20 in.)  |
| Repeatability | $\leq 3 \mu\text{m}$ (0.12 mils)   |
| Lift control  | Ergonomic handle with 90° stroke. Optional micrometer control for fine adjustment of probe card contact. |

## WAFER AND AUX CHUCK DESIGN\*

|                     |   |
|---------------------|---|
| Diameter            | 150 mm (6 in.) and 200 mm (8 in.)   |
| Material            | Nickel- or gold-plated aluminum   |
| DUT sizes supported | Shards or wafers 50mm (2 in.) through 200 mm (8 in.) Optional single-die accessory available.   |
| Vacuum interface    | Micro-hole patterns for compatibility with RF devices and thin wafers   |
| Vacuum zones        | Hole patterns arranged in approximately 10, 50, 130, 190 mm diameters (0.5, 2, 5, 7 in.)  |
| Vacuum actuation    | Multi-zone vacuum control (Summit 11000B)<br>Multi-zone vacuum control and software control (Summit 12000B)   |
| System planarity    | $\leq 35 \mu\text{m}$ (1.3 mils) @ 25°C<br>$\leq 35 \mu\text{m}$ (1.3 mils) @ -60°C (typical)<br>$\leq 35 \mu\text{m}$ (1.3 mils) @ 200°C (typical)<br>$\leq 50 \mu\text{m}$ (2.0 mils) @ 300°C (typical) |

### Auxiliary Chuck \*

|                          |  |
|--------------------------|--|
| Quantity                 | Two, integrated with wafer chuck assembly  |
| Substrate size (maximum) | 15.2 mm x 22.1 mm (0.59 in. x 0.87 in.) ISS substrate<br>19 mm x 19 mm (0.75 in. x 0.75 in.) substrate |
| Material                 | Steel (Magnetically loaded, RF absorbing Eccosorb available)   |
| Thermal isolation        | Ensures negligible load drift on ISS   |
| Flatness                 | $\leq 8 \mu\text{m}$ (0.3 mils)  |
| Vacuum actuation         | Independently controlled apart from wafer vacuum zones   |

\* These specifications are for the modular wafer/aux chucks that are configured with a Summit station platform. See the wafer/aux chucks ordering information below.

## Nucleus™ Prober Control Software

|                  |  |
|------------------|--|
| Motion control   | Wafer stage, microscope transport and positioners are easily accessed through the user interface   |
| Vision           | Uses feedback from eVue and other microscopes for alignment and compensation   |
| Alignment        | Automatic capability for wafer loading   |
| Compensation     | Automatic adjustment capability for wafer variability and thermal changes to maintain consistent probe contact   |
| Wafer map        | Real-time test monitoring, user defined binning, pass/fail status, offline definition of die and subsite location through graphical interface                          |
| Remote operation | A full command set is available for control through industry standard serial interfaces. The remote window allows single command entry and loading of prepared scripts |

## Communication Ports

| Type            | Qty | Location                  | Note  |
|-----------------|-----|---------------------------|---|
| USB 2.0         | 4   | Station controller - Rear | For security keys and USB instrument control                            |
| RS232           | 1   | Station controller - Rear | For instrument control (thermal, LASER, microscope, etc)<br>USB adapter |
| GPIB IEEE 488.2 | 1   | Station controller - Rear | For test instrument control USB adapter                                 |

## Accessory Interface Ports

| Type       | Qty | Location                   | Note  |
|------------|-----|----------------------------|---|
| Edge-sense | 1   | Station interconnect panel | Probe card contact sense                                  |
| VNA-CAL    | 1   | Station interconnect panel | Control for switched GPIB (remote/local software control) |
| INKER      | 1   | Station interconnect panel | Control for die inker                                     |

## Switched AC Power

| Type               | Qty | Location                   | Note   |
|--------------------|-----|----------------------------|--|
| IEC (f) microscope | 1   | Station interconnect panel | Software ON/OFF control for microscope light |
| IEC (f) aux        | 1   | Station interconnect panel | Software ON/OFF control for auxiliary power  |

## NON-THERMAL MODULAR CHUCKS

Note: Results measured with non-thermal chuck at standard probing height (5,000  $\mu\text{m}$ ) with chuck in a dry environment. Moisture in the chuck may degrade performance.

### FemtoGuard® Chuck Performance (200 mm)

|                   |                 |                                |
|-------------------|-----------------|--------------------------------|
| Breakdown voltage | Force-to-guard  | $\geq 500 \text{ V}$           |
|                   | Guard-to-shield | $\geq 500 \text{ V}$           |
|                   | Force-to-shield | $\geq 500 \text{ V}$           |
| Resistance        | Force-to-guard  | $\geq 1 \times 10^{12} \Omega$ |
|                   | Guard-to-shield | $\geq 1 \times 10^{11} \Omega$ |
|                   | Force-to-shield | $\geq 5 \times 10^{12} \Omega$ |

### Coaxial Chuck Performance (200 mm)

|                   |                                |
|-------------------|--------------------------------|
| Breakdown voltage | $\geq 500 \text{ V}$           |
| Isolation         | $\geq 1 \times 10^{12} \Omega$ |

### System Electrical Performance (w/ non-thermal chuck)

|                          | Summit 12000B-AP<br>FemtoGuard Chuck            | SUMMIT 12000B-M<br>FemtoGuard Chuck        | Summit 12000B-M<br>Coax Chuck | Summit 12000B-S<br>Coax Chuck |
|--------------------------|---|--|-------------------------------|-------------------------------|
| Probe leakage *          | $\leq 1 \text{ fA}$                             | $\leq 1 \text{ fA}$                        | $\leq 1 \text{ fA}$           | $\leq 20 \text{ pA}$          |
| Chuck leakage *          | $\leq 1 \text{ fA}$                             | $\leq 15 \text{ fA}$                       | $\leq 600 \text{ fA}$         | $\leq 200 \text{ pA}$         |
| Residual capacitance     | $\leq 0.4 \text{ pF}$                           | $\leq 50 \text{ pF}$                       | N/A                           | N/A                           |
| Capacitance variation ** | $\leq 3 \text{ fF}$                             | $\leq 75 \text{ fF}$                       | $\leq 75 \text{ fF}$          | $\leq 75 \text{ fF}$          |
| Settling time            | $\leq 50 \text{ fA @ } 50 \text{ ms (typical)}$ | $50 \text{ fA @ } 50 \text{ ms (typical)}$ | N/A                           | N/A                           |

\*Overall leakage current is comprised of two distinctly separate components: 1) offset, and 2) noise. Offset is the DC value of current due to instrument voltage offset driving through isolation resistance. Noise is low frequency ripple superimposed on top of offset and is due to disturbances in the probe station environment.

Noise and leakage are measured with a 4156C NOISE.dat Cascade Microtech program or equivalent; 4 ms sample rate, auto scale, 1 nA compliance, 1 NPLC integration. Settling time is measured with a 4156C SETLB.dat Cascade Microtech program or equivalent; 2 ms sampling rate, limited auto 1 nA, 1  $\mu\text{A}$  compliance, 3 NPLC integration.

\*\* This is chuck capacitance variation based upon chuck position anywhere in the 200 mm area, as measured by a stationary dc probe. Test conditions: Agilent 4284A LCR meter (Cp-d, 1 Mhz, 4 Average, 0 Power), DCP-150, 75  $\mu\text{m}$  above chuck surface, 4-wire connection (HiZ/Hipot to chuck, LoZ/Lopot to Probe).

## THERMAL MODULAR CHUCKS

Note: Results measured with thermal chuck at standard probing height (5000  $\mu\text{m}$ ) with chuck in a dry environment. Moisture in the chuck may degrade performance. 6-inch coaxial chuck capacitance is 25% less, dominated by the cabling. All other specifications are identical. 6-inch triaxial is not available.

### FemtoGuard Chuck Performance (150/200 mm)

|                   |                 | Thermal Chuck<br>@ -60/-55°C  | Thermal Chuck<br>@ 25°C       | Thermal Chuck<br>@ 200°C      | Thermal Chuck<br>@ 300°C      |
|-------------------|-----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Breakdown voltage | Force-to-guard  | $\geq 500\text{ V}$           | $\geq 500\text{ V}$           | $\geq 500\text{ V}$           | $\geq 500\text{ V}$           |
|                   | Guard-to-shield | $\geq 500\text{ V}$           | $\geq 500\text{ V}$           | $\geq 500\text{ V}$           | $\geq 500\text{ V}$           |
|                   | Force-to-shield | $\geq 500\text{ V}$           | $\geq 500\text{ V}$           | $\geq 500\text{ V}$           | $\geq 500\text{ V}$           |
| Resistance        | Force-to-guard  | $\geq 1 \times 10^{12}\Omega$ | $\geq 1 \times 10^{12}\Omega$ | $\geq 5 \times 10^{11}\Omega$ | $\geq 1 \times 10^{11}\Omega$ |
|                   | Guard-to-shield | $\geq 1 \times 10^{11}\Omega$ | $\geq 1 \times 10^{11}\Omega$ | $\geq 1 \times 10^{10}\Omega$ | $\geq 1 \times 10^9\Omega$    |
|                   | Force-to-shield | $\geq 5 \times 10^{12}\Omega$ | $\geq 5 \times 10^{12}\Omega$ | $\geq 5 \times 10^{11}\Omega$ | $\geq 1 \times 10^{11}\Omega$ |

### Coaxial Chuck Performance (150/200 mm)

|                   | Thermal Chuck<br>@ -60/-55°C  | Thermal Chuck<br>@ 25°C       | Thermal Chuck<br>@ 200°C      | Thermal Chuck<br>@ 300°C   |
|-------------------|-------------------------------|-------------------------------|-------------------------------|----------------------------|
| Breakdown voltage | $\geq 500\text{ V}$           | $\geq 500\text{ V}$           | $\geq 500\text{ V}$           | $\geq 500\text{ V}$        |
| Resistance        | $\geq 1 \times 10^{11}\Omega$ | $\geq 1 \times 10^{11}\Omega$ | $\geq 1 \times 10^{10}\Omega$ | $\geq 1 \times 10^9\Omega$ |

### System Electrical Performance (w/ thermal chuck)

|                          |                         | Summit 12000B-AP<br>FemtoGuard Chuck         | Summit 12000B-M<br>FemtoGuard Chuck          | Summit 12000B-M<br>Coax Chuck | Summit 12000B-S<br>Coax Chuck |
|--------------------------|-------------------------|--|--|-------------------------------|-------------------------------|
| Probe leakage *          | Thermal controller OFF  | $\leq 1\text{ fA}$                           | $\leq 1\text{ fA}$                           | $\leq 1\text{ fA}$            | $\leq 20\text{ pA}$           |
|                          | Thermal controller ON   | $\leq 5\text{ fA}$                           | $\leq 10\text{ fA}$                          | $\leq 10\text{ fA}$           | $\leq 20\text{ pA}$           |
| Chuck leakage * [ERS]    | Thermal controller OFF  | $\leq 2\text{ fA}$                           | $\leq 15\text{ fA}$                          | $25\text{ pA}$                | $800\text{ pA}$               |
|                          | -60°C                   | $\leq 6\text{ fA}$                           | $\leq 20\text{ fA}$                          | $25\text{ pA}$                | N/A                           |
|                          | 25°C                    | $\leq 3\text{ fA}$                           | $\leq 20\text{ fA}$                          | $25\text{ pA}$                | $800\text{ pA}$               |
|                          | 200°C                   | $\leq 6\text{ fA}$                           | $\leq 20\text{ fA}$                          | $25\text{ pA}$                | $800\text{ pA}$               |
|                          | 300°C                   | $\leq 6\text{ fA}$                           | $\leq 25\text{ fA}$                          | $220\text{ pA}$               | $1000\text{ pA}$              |
| Chuck leakage * [ESPEC]  | Thermal controller OFF  | $\leq 2\text{ fA}$                           | $\leq 15\text{ fA}$                          | $25\text{ pA}$                |                               |
|                          | -50°C                   | $\leq 6\text{ fA}$                           | $\leq 20\text{ fA}$                          | $25\text{ pA}$                | $800\text{ pA}$               |
|                          | 25°C                    | $\leq 3\text{ fA}$                           | $\leq 15\text{ fA}$                          | $25\text{ pA}$                | N/A                           |
|                          | 200°C                   | $\leq 6\text{ fA}$                           | $\leq 20\text{ fA}$                          | $25\text{ pA}$                | $800\text{ pA}$               |
| Residual capacitance     |                         | $\leq 2.5\text{ pF}$                         | $\leq 50\text{ pF}$                          | N/A                           | N/A                           |
| Capacitance variation ** |                         | $\leq 3\text{ fF}$                           | $\leq 75\text{ fF}$                          | $\leq 75\text{ fF}$           | $\leq 75\text{ fF}$           |
| Settling time ***        | All temperatures @ 10 V | $\leq 50\text{ fA @ }50\text{ ms (typical)}$ | $\leq 50\text{ fA @ }50\text{ ms (typical)}$ | N/A                           | N/A                           |

\* Overall leakage current is comprised of two separate components: 1) offset, and 2) noise. Offset is the DC value of current due to instrument voltage offset driving through isolation resistance. Noise is low frequency ripple superimposed on top of offset and is due to disturbances in the probe station environment.

Noise and leakage are measured with a 4156C NOISE.dat Cascade Microtech program or equivalent; 4ms sample rate, auto scale, 1nA compliance, 1 NPLC integration.

\*\* This is chuck capacitance variation based upon chuck position anywhere in the 200 mm area, as measured by a stationary dc probe. Test conditions: Agilent 4284A LCR meter (Cp-d, 1 Mhz, 4 Ave, 0 Power), DCP-150, 75  $\mu\text{m}$  above chuck surface, 4-wire connection (HiZ/Hipot to chuck, Loz/Lopot to Probe), 25°C.

\*\*\* Settling time is measured with a 4156C SETLB.dat Cascade Microtech program or equivalent; 2 ms sampling rate, limited auto 1 nA, 1  $\mu\text{A}$  compliance, 3 NPLC integration.

## THERMAL OPTIONS AND PERFORMANCE

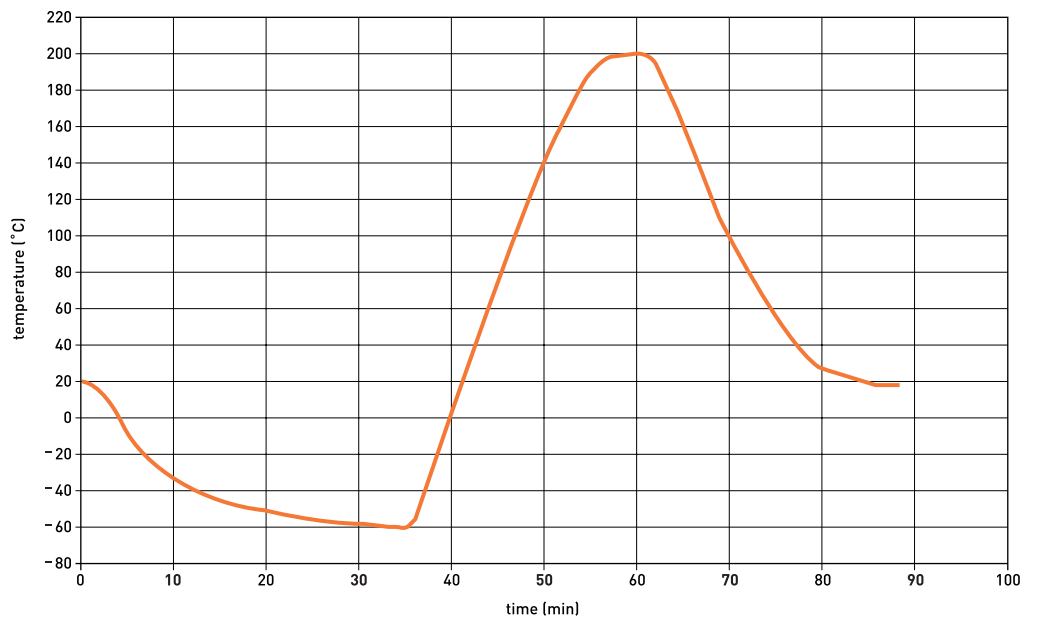
|  |   |
|--|---|
| <b>Standard Thermal Ranges</b> (others available on request) | -60°C to 200°C, DirectCool ESPEC (200 mm)       |
|  | -55°C to 200°C, AlrCool ERS (200 mm)            |
|  | +20°C to 300°C, AlrCool ERS (200 mm and 150 mm) |
|  | +30°C to 300°C, AlrCool ERS (200 mm and 150 mm) |

### ESPEC Direct Cool Performance, 200 mm (-60°C to 200°C)

|   |   |
|---|---|
| Temperature range                         | -60°C to 200°C  |
| Transition time – Heating (-60°C to 25°C) | 7 min   |
| Transition time – Heating (25°C to 200°C) | 24 min  |
| Transition time – Cooling (200°C to 25°C) | 30 min  |
| Transition time – Cooling (25°C to -60°C) | 35 min  |
| Temperature uniformity                    | ≤ 0.5°C @ 25°C, ≤ 2°C @ -60°C, ≤ 2°C @ 200°C                          |
| Temperature accuracy                      | 0.1°C   |
| Temperature resolution                    | ± 0.3°C (with calibrated controller)                                  |
| Chuck flatness                            | ≤ 30 μm (0.12 mils) @ -65°C to 200°C                                  |
| Audible noise                             | < 60 dB   |
| Cooling method                            | Closed loop, direct cooling (refrigerant)                             |
| Power consumption                         | 2000 W  |
| Supply voltage                            | 200/230 VAC 50/60 Hz  |
| Dimensions - Controller                   | 150 mm (W) x 687 mm (D) x 244 mm (H) (5.9 in. x 27.0 in. x 9.6 in.)   |
| Dimensions - Chiller                      | 430 mm (W) x 660 mm (D) x 680 mm (H) (16.9 in. x 25.9 in. x 26.8 in.) |
| Weight - Controller                       | 35 kg (77 lb.)  |
| Weight - Chiller                          | 100 kg (220 lb.)  |

### ESPEC Thermal Transition Time (-60°C to 200°C)

Typical times using Summit-AP with FemtoGuard Chuck; 10-15% faster with coaxial chuck.



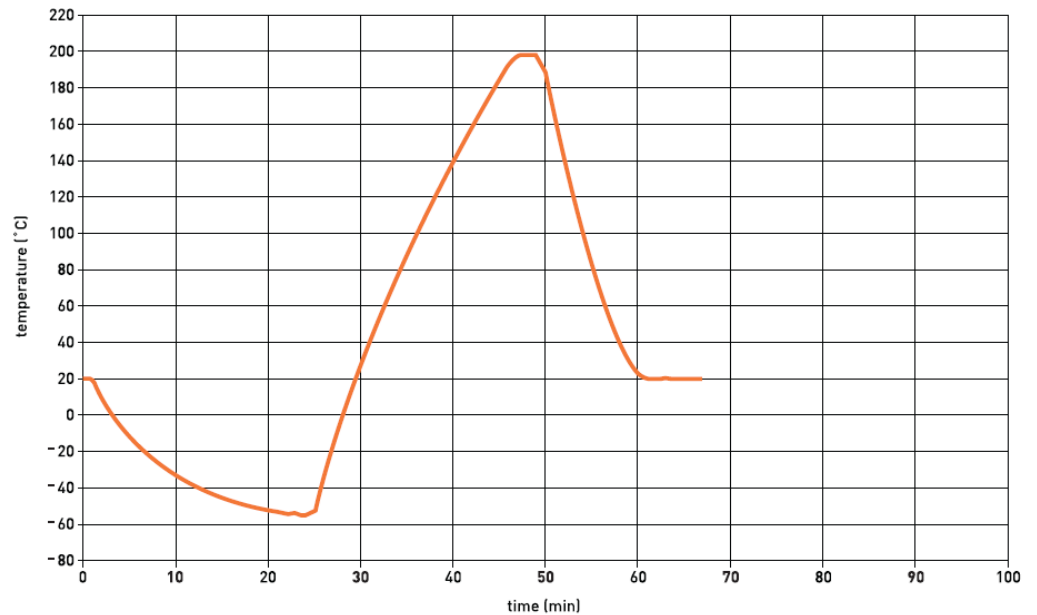
## THERMAL OPTIONS AND PERFORMANCE

### ERS AC3 Thermal System Specifications, 200 mm (-55°C to 200°C)

|   |   |
|---|---|
| Temperature range                         | -55°C to 200°C  |
| Transition time – Heating (-55°C to 25°C) | 6 min   |
| Transition time – Heating (25°C to 200°C) | 18 min  |
| Transition time – Cooling (200°C to 25°C) | 11 min  |
| Transition time – Cooling (25°C to -55°C) | 23 min  |
| Temperature uniformity                    | ≤ 0.5°C @ 25°C, ≤ 2.0°C @ -55°C, ≤ 2.0°C @ 200°C                      |
| Temperature accuracy                      | ± 0.1° C (with calibrated controller)                                 |
| Temperature resolution                    | 0.1° C  |
| Chuck flatness                            | ≤ 30 µm (0.12 mils) @ -55° C to 200°C                                 |
| Audible noise                             | < 58 dB   |
| Supply air                                | 350 liters/min (12.3 SCFM), -45°C dew point                           |
| Supply voltage                            | 200/230 VAC 50/60 Hz  |
| Power consumption - Controller            | 530 VA  |
| Power consumption - Chiller               | 2300 VA   |
| Dimensions - Controller                   | 483 mm (W) x 376 mm (D) x 144 mm (H) (19.0 inc. x 14.8 in. x 5.7 in.) |
| Dimensions - Chiller                      | 42 mm (W) x 500 mm (D) x 1030 mm (H) (1.6 in. x 19.7 in. 40.5 in.)    |
| Weight - Controller                       | 10 kg (22 lb.)  |
| Weight - Chiller                          | 150 kg (110 lb.)  |

### ERS AirCool Plus Thermal Transition Time (-55°C to 200°C)

Typical times using Summit-AP with FemtoGuard Chuck; 10-15% faster with coaxial chuck.



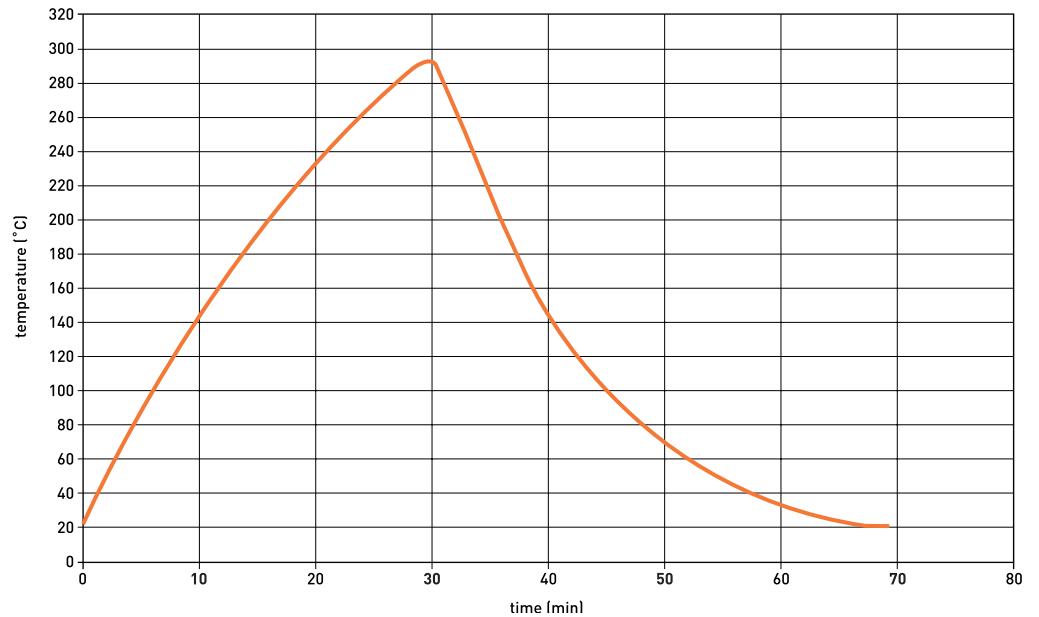
## THERMAL OPTIONS AND PERFORMANCE

### ERS Air Cool Plus Ambient Option Specifications, 150/200 mm (+20°C to 300°C)

|                           |  |
|---------------------------|--|
| Temperature range         | + 20°C to 300°C  |
| Transition time - Heating | 30 min 200 mm (8 in.) / 20 min 150 mm (6 in.)                      |
| Transition time - Cooling | 35 min 200 mm (8 in.) / 20 min 150 mm (6 in.)                      |
| Temperature accuracy      | ± 0.1°C (with calibrated controller)                               |
| Temperature resolution    | 0.1°C  |
| Temperature uniformity    | ≤ 0.5°C @ 30°C, ≤ 3.0°C @ 300°C                                    |
| Chuck flatness            | ≤ 30 μm (0.12 mils) @ +20 to 300°C                                 |
| Audible noise             | < 58 dB  |
| Supply voltage            | 100/230 VAC 50/60 Hz   |
| Supply air                | 350 liters/min (12.4 SCFM) -45°C dew point                         |
| Power consumption         | 530 VA   |
| Dimensions                | 483 mm (W) x 376 mm (D) x 144 mm (H) (19.0 in. x 14.8 in. 5.7 in.) |
| Weight                    | 10 kg (22 lb.)   |

### ERS AirCool Thermal Transition Time (+20°C to 300°C)

Typical times using Summit-AP with FemtoGuard Chuck; 10-15% faster with coaxial chuck.



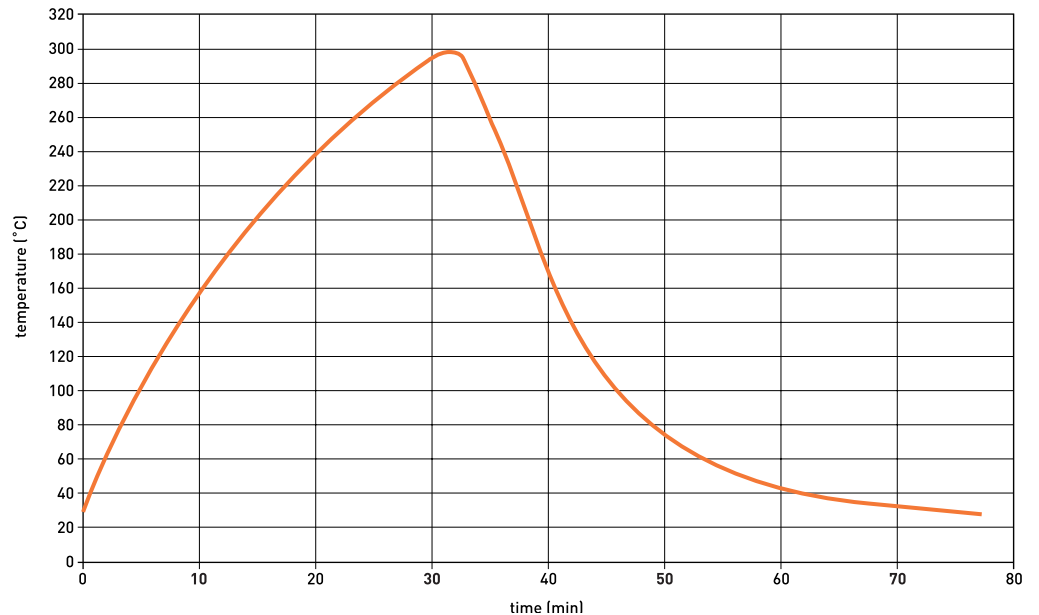
## THERMAL OPTIONS AND PERFORMANCE

### ERS Air Cool Ambient Option Specifications, 150/200 mm (+30°C to 300°C)

|                           |  |
|---------------------------|--|
| Temperature range         | + 30 to 300°C  |
| Transition time - Heating | 30 min 200 mm (8 in.) / 20 min 150 mm (6 in.)                    |
| Transition time - Cooling | 40 min 200 mm (8 in.) / 25 min 150 mm (6 in.)                    |
| Temperature accuracy      | ± 0.1°C (with calibrated controller)                             |
| Temperature resolution    | 0.1°C  |
| Temperature uniformity    | ≤ 0.5°C @ 30°C, ≤ 3.0°C @ 300°C                                  |
| Chuck flatness            | ≤ 30 µm (0.12 mils) @ +30°C to 300°C                             |
| Audible noise             | < 58 dB  |
| Supply voltage            | 100/230 VAC 50/60 Hz   |
| Supply air                | 350 liters/min (12.4 SCFM) -45°C dew point                       |
| Power consumption         | 530 VA   |
| Dimensions                | 483 mm (W) x 276 mm (D) x 144 mm (H) (19.0 in. 14.8 in. 5.7 in.) |
| Weight                    | 10 kg (22 lb.)   |

### ERS Air Cool Thermal Transition Time (+30°C to 300°C)

Typical times using Summit-AP with FemtoGuard Chuck; 10-15% faster with coaxial chuck.



## FACILITY REQUIREMENTS

Note: These are for the Summit station only. Thermal system not included, see the Stations Facility Guide for complete information.

|                       |  |
|-----------------------|--|
| Vacuum                | 3.4 liter/minute (0.12 SCFM) @ 400 mm Hg (15.7 in.Hg)  |
| Dry-air purge         | 4.3 liters/sec (9 SCFM)  |
| Compressed air        | 0.1 liters/sec (0.2 SCFM) @ 380 kPa (55 psi) minimum   |
| Background vibrations | “Operating Theatre” level (as specified by ISO) on Cascade Microtech approved vibration tables |
| Power                 | 100/115 V @ 2 A, 200/230 V @ 1 A   |

### AVAILABLE STATION MODELS

**Summit 12000B-AP** – Probe station platform, semi-automatic with MicroChamber, AttoGuard and PureLine technology

*Configuration includes*

---

MicroChamber for dark, dry and enhanced EMI-shielding enclosure

---

PureLine technology for premium signal path fidelity

---

AttoGuard for enhanced I-V and C-V testing

---

Roll-out wafer stage for safe and easy wafer loading

---

High-stability platen with linear lift

---

4-axis precision motorized stage

---

User guides, tools, and accessories

---

Universal power cord kit

---

Nucleus prober control software

---

Complete automation tools - AutoAlign, AutoDie, AutoXYZT Correction

---

Thermal control, video window, wafermap, remote access

---

**Summit 12000B-M** – Probe station platform, semi-automatic with MicroChamber

*Configuration includes*

---

MicroChamber for dark, dry and enhanced EMI-shielding enclosure

---

Roll-out wafer stage for safe and easy wafer loading

---

High-stability platen with linear lift

---

4-axis precision motorized stage

---

User guides, tools and accessories

---

Universal power cord kit

---

Nucleus prober control software

---

Complete automation tools - AutoAlign, AutoDie, AutoXYZT correction

---

Thermal control, video window, wafer map, remote access

---

**Summit 12000B-S** – Probe station platform, semi-automatic, standard

*Configuration includes*

---

Integrated safety enclosure for wafer protection and door access

---

Roll-out wafer stage for safe and easy wafer loading

---

High-stability platen with linear lift

---

4-axis precision motorized stage

---

User guides, tools and accessories

---

Universal power cord kit

---

Nucleus prober control software

---

Complete automation tools - AutoAlign, AutoDie, AutoXYZT correction

---

Thermal control, video window, wafer map, remote access

---

**AVAILABLE STATION MODELS**

**Summit 11000B-AP** – Probe station platform, manual with MicroChamber, AttoGuard and PureLine technology

*Configuration includes*

MicroChamber for dark, dry and enhanced EMI-shielding enclosure

PureLine technology for premium signal path fidelity

AttoGuard for enhanced I-V and C-V testing

Roll-out wafer stage for safe and easy wafer loading

High-stability platen with linear lift

Precision manual X-Y stage

User guides, tools and accessories

**Summit 11000B-M** – Probe station platform, manual with MicroChamber

*Configuration includes*

High-stability platen with linear lift

Precision manual X-Y stage

User guides, tools and accessories

**Summit 11000B-S** – Probe station platform, manual, standard

*Configuration includes*

Integrated safety enclosure for wafer protection and door access

Roll-out wafer stage for safe and easy wafer loading

High-stability platen with linear lift

Precision manual X-Y stage

User guides, tools and accessories

Note: To complete the Summit station platform configuration:

1. Select a modular chuck from the following non-thermal or thermal list
2. Select a matching thermal system if a thermal chuck is desired

**Summit Non-Thermal Chucks**

| PART NUMBER  | General Description                                    | Chuck Compatibility |   |   |
|--------------|--|---------------------|---|---|
|              |  | AP                  | M | S |
| TC-002-30x   | FemtoGuard triaxial chuck, non-thermal, 200 mm (8 in.) | ●                   | ● |   |
| TC-002-10x   | Coaxial chuck, non-thermal, 200 mm (8 in.)             |                     | ● | ● |
| TC-002-10x-6 | Coaxial chuck, non-thermal, 150 mm (6 in.)             |                     | ● | ● |

**Summit Thermal Chucks**

| PART NUMBER | General Description  | Chuck Compatibility |   |   |
|-------------|--|---------------------|---|---|
|             |  | AP                  | M | S |
| TC-302-30x  | FemtoGuard triaxial chuck, thermal, -60°C to 200°C (direct-cooled ESPEC), 200 mm (8 in.) | ●                   | ● |   |
| TC-212-30x  | FemtoGuard triaxial chuck, thermal, -55°C to 200°C (air-cooled ERS), 200 mm (8 in.)      | ●                   | ● |   |
| TC-202-30x  | FemtoGuard triaxial chuck, thermal, 20/30°C to 300°C (air-cooled ERS), 200 mm (8 in.)    | ●                   | ● |   |
| TC-302-10x  | Coaxial chuck, thermal, -60°C to 200°C (direct-cooled ESPEC), 200 mm (8 in.)             |                     | ● | ● |
| TC-212-10x  | Coaxial chuck, thermal, -55°C to 200°C (air-cooled ERS), 200 mm (8 in.)                  |                     | ● | ● |
| TC-202-10x  | Coaxial chuck, thermal, 20/30°C to 300°C (air-cooled ERS), 200 mm (8 in.)                |                     | ● | ● |
| TC-203-10x  | Coaxial chuck, thermal, 20/30°C to 300°C (air-cooled ERS), 150 mm (6 in.)                |                     | ● | ● |

Note: x = 1 for nickel, x = 2 for gold

## ORDERING INFORMATION (CONTINUED)

### Summit Thermal Systems (200 mm)

| PART NUMBER | General Description   |
|-------------|---|
| TS-302-07P  | Thermal system for Summit, -60°C to 200°C, direct-cooled ESPEC (200/230 VAC 50/60 Hz) |
| TS-212-07P  | Thermal system for Summit, -55°C to 200°C, air-cooled ERS (200/230 VAC 50/60 Hz)      |
| TS-202-05T  | Thermal system for Summit, +20°C to 300°C, air-cooled ERS (100-230 VAC 50/60 Hz)      |
| TS-202-02T  | Thermal system for Summit, +30°C to 300°C, air-cooled ERS (100-230 VAC 50/60 Hz)      |

Note: Alternate thermal ranges available upon request.

### Summit Thermal Systems (150 mm)

| PART NUMBER | General Description  |
|-------------|--|
| TS-203-05T  | Thermal system for Summit, +20°C to 300°C, air-cooled ERS (100-230 VAC 50/60 Hz) |
| TS-203-02T  | Thermal system for Summit, +30°C to 300°C, air-cooled ERS (100-230 VAC 50/60 Hz) |

Note: Thermal systems must match the thermal chuck selected, i.e. TS-302-xxx thermal systems are compatible only with TC-302-xxx chucks.

## STANDARD OPTIONS FOR MICROSCOPE MOUNTS

| High Stability Bridge/Transport (programmable) | Part Number 123-224  |
|--|--|
| Travel X-Y                                     | 50 mm x 50 mm (2 in. x 2 in.)  |
| Travel X-Y in TopHat                           | 13 mm x 13 mm (0.5 in. x 0.5 in.)                                      |
| Type   | Stepper motor with closed loop encoder system                          |
| Resolution X-Y                                 | 0.4 µm (0.016 mils)  |
| Repeatability X-Y                              | ≤ 2 µm (0.08 mils)   |
| Accuracy X-Y                                   | ≤ 5 µm (0.2 mils)  |
| Speed X-Y                                      | 5 mm (0.2 in.) /sec  |
| Planarity                                      | 10 µm (0.4 mils) over full travel with 5 kg (11 lb.) load              |
| Z gross lift                                   | Tilt-back, pneumatic with up/down, for easy probe access               |
| Z gross repeatability                          | 1 µm (0.04 mils)   |
| Z focus  | Coarse/fine focus uses microscope system, programmable focus available |
| LASER compatible                               | Yes  |

| High Stability Bridge/Transport (manual) | Part Number 114-739                                       |
|--|---|
| Travel X-Y                               | 25 mm x 25 mm (1 in. x 1 in.)                             |
| Travel X-Y in TopHat                     | 13 mm x 13 mm (0.5 in. x 0.5 in.)                         |
| Resolution X-Y                           | 5 mm (0.2 in.) / turn, coaxial XY control                 |
| Planarity                                | 10 µm (0.4 mils) over full travel with 5 kg (11 lb.) load |
| Z gross lift                             | Tilt-back, pneumatic with up/down, for easy probe access  |
| Z gross repeatability                    | 1 µm (0.04 mils)  |
| Z focus                                  | Coarse/fine focus uses microscope system                  |
| LASER compatible                         | Yes   |

| Large Area Bridge / Transport | Part Number 114-468                                     |
|-------------------------------|---|
| XY travel                     | 200 mm x 125 mm (7.8 in. x 4.9 in.)                     |
| XY travel in TopHat           | 13 mm x 13 mm (0.5 in. x 0.5 in.)                       |
| Resolution X-Y                | 5 mm (0.2 in.) / turn                                   |
| Planarity                     | 75 µm (3 mils) over full travel with 5 kg (11 lb.) load |
| Z gross lift                  | 150 mm (6 in.) manual linear lift with counterbalance   |
| Z gross repeatability         | 5 µm (0.2 mils)   |
| Z focus                       | Coarse/fine focus uses microscope system                |
| LASER compatible              | No  |

## SUMMIT STATION ACCESSORIES

Microscope / video system

Vibration isolation table

Probe card holders

RF and DC probes, needles and probe cards

RF and DC cables and adapters

RF and DC probe positioners

Calibration software and standards

Vacuum pump, air compressor

## REGULATORY COMPLIANCE

Certification TÜV compliance tested for CE and CB, certified for US and Canada, SEMI S2 and S8

## WARRANTY\*

Warranty Fifteen months from date of delivery or twelve months from date of installation

Service contracts Single and multi-year programs available to suit your needs

\*See Cascade Microtech's Terms and Conditions for Sale for more details.

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