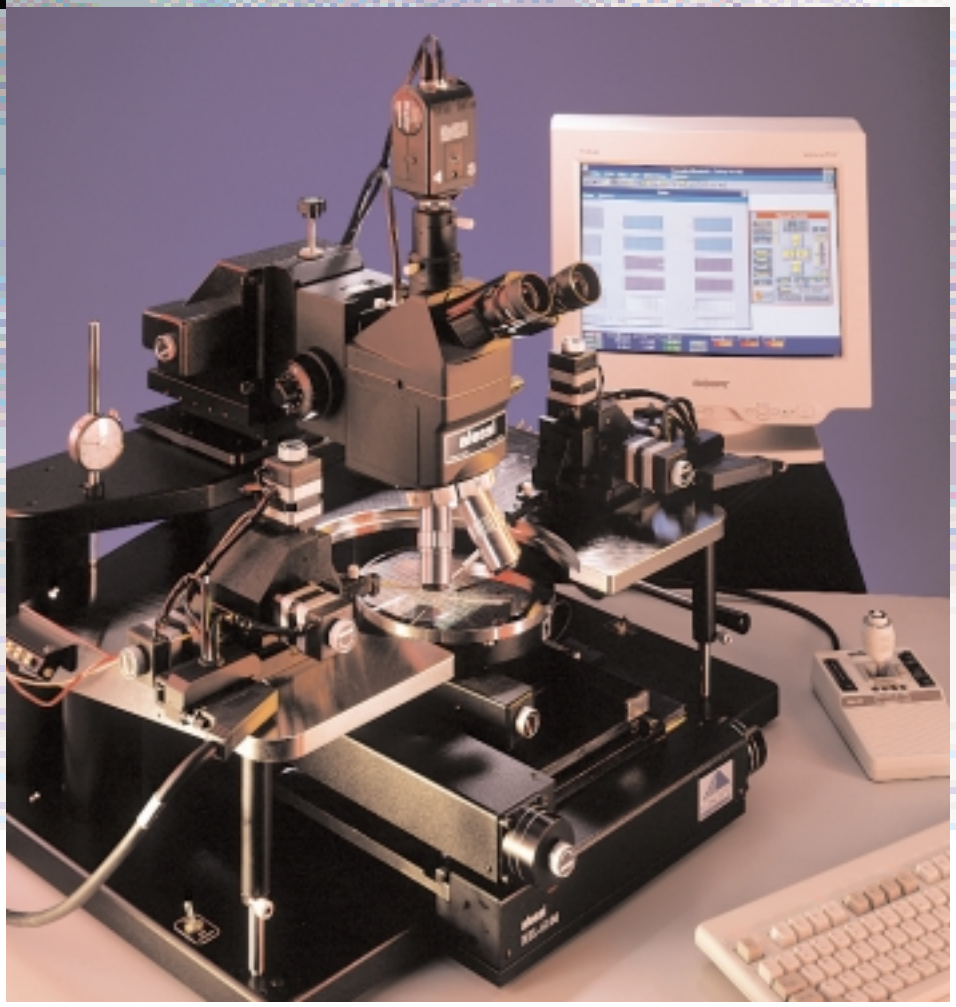




Alessi Probing Systems for Failure Analysis and Parametric Measurements

The REL-6100 and REL-4800 Series Parametric Probe Stations combine precision sub-micron probing capability with the superior measurement performance necessary for DC/CV analysis. The stations feature sub-micron resolution, precise motion control, and 8-inch travel.

CASCADE® MICROTECH

Innovating Test Technologies™

REL-6100 Series combines the world's foremost failure analysis

The REL-4800 Series Manual Probe Stations and REL-6100 Series Semiautomatic Probe Stations offer superior performance whether probing the smallest internal IC feature for failure analysis or making accurate DC/CV parametric measurements on-wafer.

Both series feature submicron resolution and excellent stability for probing 200 mm (8-inch) wafers.

The power-assisted tilt-back microscope and platen lift handle make application changeover and needle replacement effortless.

Choose from eight different models that provide manual or semiautomatic probing, a fully guarded chuck, a standard or high-temperature thermal chuck.

Semiautomatic stations have programmable motors for precise station movement with manual control via a remote joystick. Powerful Galaxy™ Prober Control Software provides all the features required to simplify wafer probing.

Multiple Wavelength 20 Hz Laser System

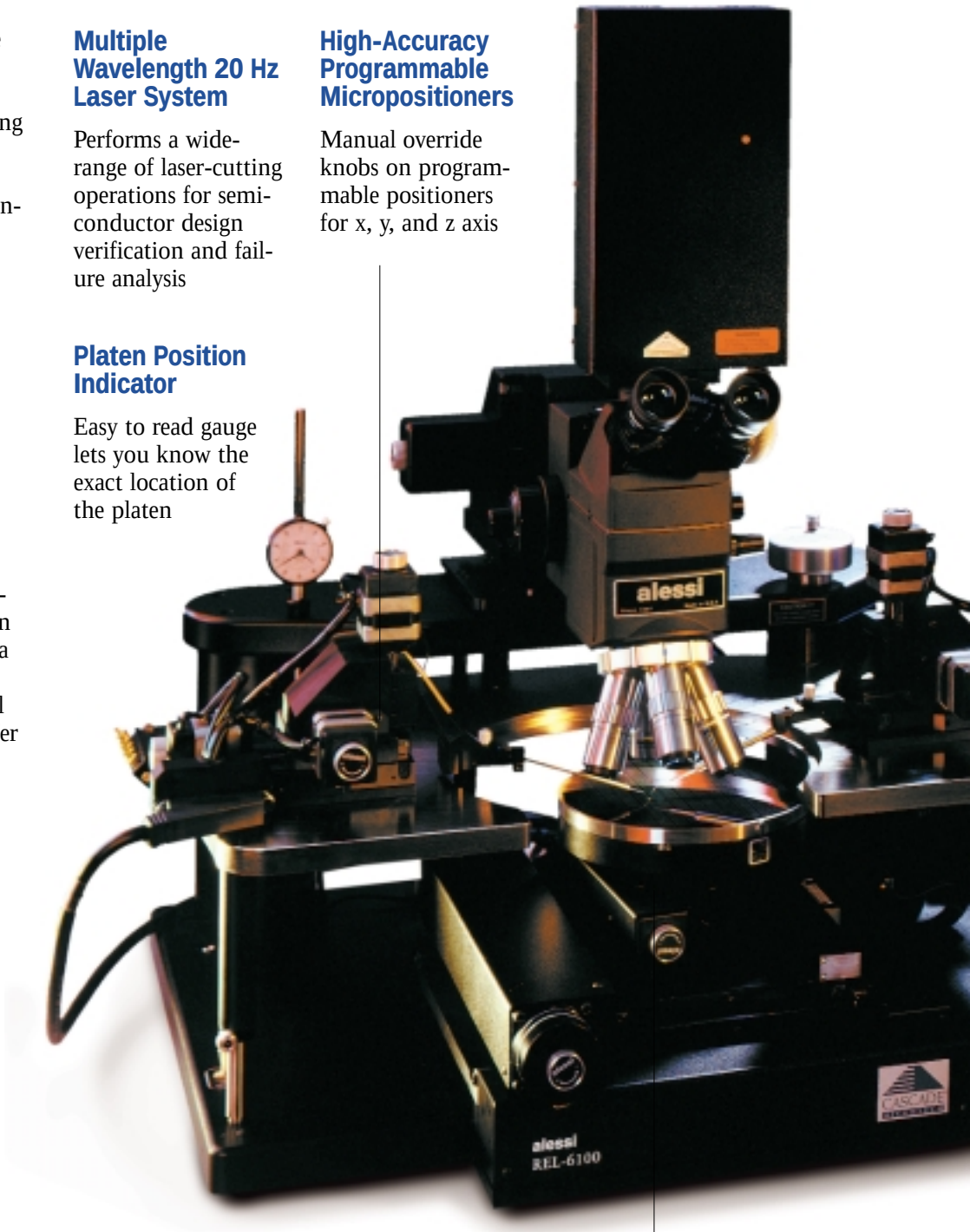
Performs a wide-range of laser-cutting operations for semiconductor design verification and failure analysis

High-Accuracy Programmable Micropositioners

Manual override knobs on programmable positioners for x, y, and z axis

Platen Position Indicator

Easy to read gauge lets you know the exact location of the platen



High Performance Probes

The guarding and Kelvin connections of your parametric test instruments now extends to the probe tips

300°C Low-Leakage Thermal Chuck

Ensures industry-best results with ultra-guarded chuck; has two electrical isolation layers with a guard layer sandwiched between

Smart Microstepper Motors

Ensure precise submicron chuck movement.

system with precision, parametric capability.

Improved Visibility

Live video display is sychronized with probe to keep the tip always in view. Excellent when deprocessing, such as polyimide removal using UV and top-metal removal via green laser, for internal device access

Seamless Integration with Other Windows Applications

Galaxy integrates easily with virtual instrumentation software such as Metrics, LabVIEW, HP VEE, and MOSAID

Galaxy Software

Powerful, easy-to-use Galaxy software allows automatic testing of semiconductor devices with sub-micron resolution at the touch of a button



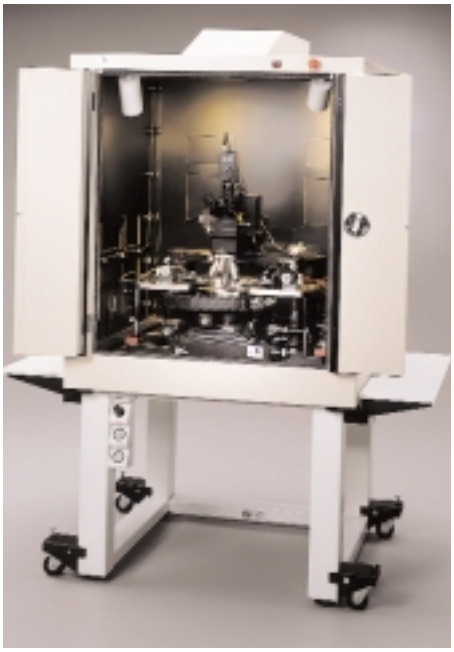
Full Control of System Using AUCS

Allows system and external device control via RS-232 or IEEE-488

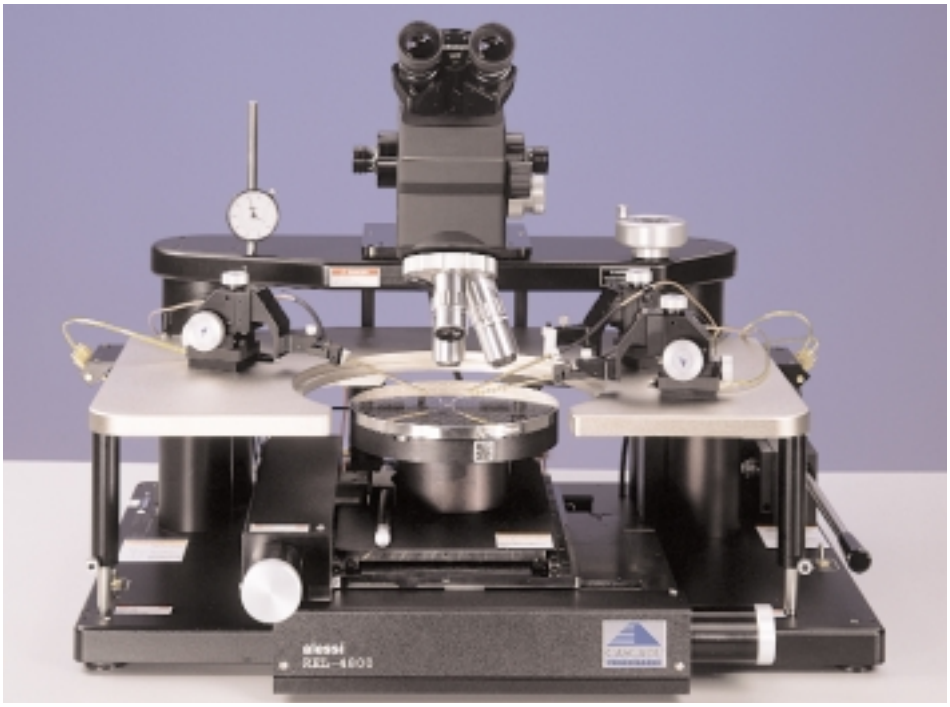
Motorized Joystick Control

Easy control of all programmable functions

REL-6100-Series Probe Station complete with A-Zoom microscope, laser system, micropositioners, high-performance probes, and Galaxy prober control software



Dark box and anti-vibration table for light-tight measurements.



The REL-4800 Series offers superior performance for on-wafer measurements.



Features and Benefits

REL-6100, REL-4800 Series

- 8-in. (203 mm) chuck with 3/8 in. (1 cm) z-travel
- High precision stage for internal-die probing
- Multiple wavelength 20 Hz laser systems perform a wide-range of laser-cutting operations for semiconductor design verification and failure analysis
- Thermal guarded chuck, fully integrated, allows very low-noise measurements over ranges to 300°C
- Triaxial guarded chuck with ultra low-leakage, low-capacitance measurement area
- Fast changeover from standard front-side probing applications to backside probing

REL-6100 Series

- Manual and motorized override of all programmable functions under closed-loop continuous tracking conditions. Extremely useful for fast probe tip replacement in programmable and CAD navigation environments
- Self-evident movement control with manual knobs, joystick, or mouse
- Galaxy probing software integrates easily with virtual instrumentation software, such as Metrics, IC/V, LabVIEW, HP VEE, and MOSAID
- Hands-off control eliminates operator-induced vibration
- Interfacing with Windows DDE, RS-232 or GPIB

Application	Common Problem	Cascade Advantage
Liquid Crystal Analysis	Thermal defect location	Temperature gradient control to 0.1°C throughout full temperature range with crystal solutions, available from approximately 30°C to 100°C.
Emission Microscopy	Photon generation defect location	Full system integration with all commercially available emission microscopy products.
Device Backside Observation	Device top layer metalization prevents accurate optical fault isolation.	Fast changeover from standard front-side probing applications to backside probing. Both probe card and manual positioner compatibility.
Internal Node Probing	Submicron device probing	Localized deprocessing with multiple wavelength laser systems combined with hands-off programmable positioners.
Application Specific Set-ups	Wasted time and aggravation when changing from application to application	Manual and motorized override of all programmable functions under closed-loop continuous tracking conditions. Extremely useful for fast probe tip replacement in programmable and CAD navigation environments.
Hot-carrier Induced Gate Leakage	Long measurement settling time	Ultra-low-capacitance probes and probe cards reduce settling time to milliseconds.
TVS – Triangular Voltage Sweep	EMI from thermal chuck heater perturbs DUT measurement area	Guarded thermal chuck reduces perturbations providing up to 3,000x more sensitivity for mobile charge detection.
Hfe – Gummel Plot	High capacitance (pF range) causes DV/DT errors; very slow voltage sweeps must be used	Ultra-low-capacitance probes and accessories allow fast, error-free sweeps.
High-Temperature Device Characterization	High-capacitance chuck results in long measurement settling times and possible test equipment oscillation	300°C guarded chuck reduces chuck capacitance by 25 times. Guaranteed compatibility with HP parametric testers.
WLR High-Temperature Reliability Measurements	Temperature unit must be cycled off to make low-leakage measurements	fA level leakage measurements can be made with the thermal unit on, providing increased throughput



A toggle switch activates the microscope tilt-back function.



Dark box has quick release side and back panels for easy access to the entire probe and test interface. Uses standard or tester-specific knockout panels.

Superior Parametric Measurements

Noise, leakage, and measurement settling times have been greatly reduced with the REL-4800 series and REL-6100 series manual and semiautomatic stations, even when using a 48-pin probe card.

Cascade's Low-Leakage Probe Card System integrates directly with popular switches. The system offers up to 48-pin probing in a low-current, low-noise, and low-capacitance probing environment.

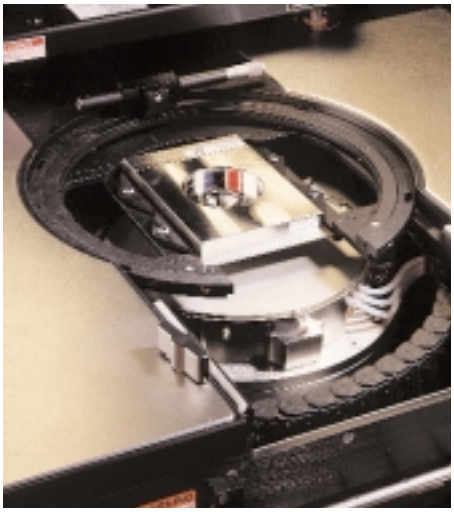
Probe at 300°C Without Compromised Measurements

Cascade offers wafer probing systems with up to 300°C operation and <50 fA probe noise.

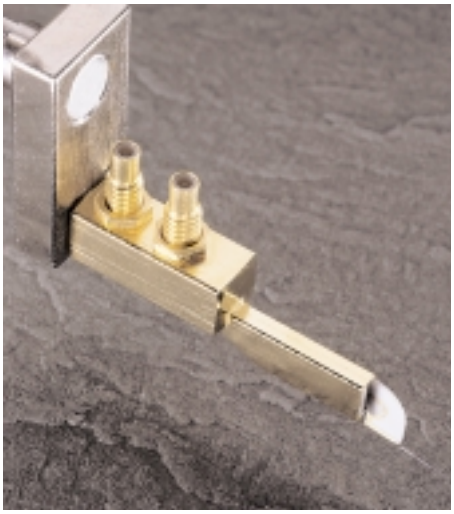
Each station features:

- High-temperature ceramic low-noise probes
- Electrically quiet thermal chuck
- Robust, integrated chuck service loop
- < 50 fA noise and leakage over the complete temperature range

The system allows you to make femtoamp-level measurements with the thermal unit on. Most temperature units must be cycled off to make low-leakage measurements.



The Low-leakage Probe Card provides up to 48 low-leakage probes.



High-performance ceramic DCP Probes ensure less than 50 fA of leakage + noise current over a -65°C to 300°C operating range.

Low-Leakage Probe Card

The Low-Leakage Probe Card system is designed for use on Alessi REL-4800 and 6100 Series stations for direct integration with popular switches. It offers up to 48-pin probing in a low-current, low-noise, and low-capacitance environment.

With the Low-Leakage Probe Card, ultra-low noise cable harness, and metal dark box, leakage and noise is < 5 fA. Specifications are not degraded significantly even when used with the Alessi-series thermal probe stations. Quick-disconnect connectors allow probe cards to be interchanged quickly and easily.

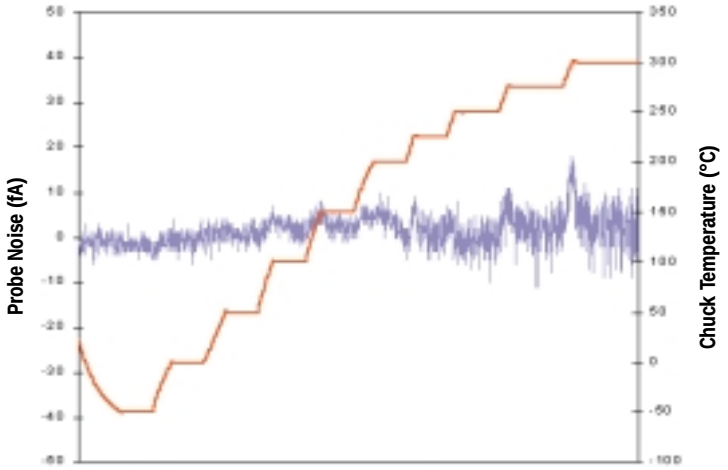
The probe card is used with the RAC-52 Probe Card Holder which can accept probe cards from 4.5 in. to 7 in. wide in 0.5 in. increments. Theta rotation is 3.5 degrees in either direction from center.

High Performance Thermal DCPs

High-performance, thermal DCP probes (recommended for our new 300°C systems) provide less than 50 fA leakage current over a -55°C to 300°C temperature range.

With superior guarding and shielding, these probes overcome the performance limitations of non-coaxial needles.

Chart shows leakage and noise of DCP-HTR with replaceable probe tip vs. chuck temperature.



Typical System Performance

Model Number	Thermal Systems	Probe Leakage + Noise P-P		Probe Card Leakage + Noise		Chuck Leakage + Noise P-P		Chuck Residual Capacitance
		off	on	off	on	off	on	
4800, 6100		5 fA	—	< 5 fA	—	n/a	—	—
4840, 6140		5 fA	—	< 5 fA	—	< 20 fA *	—	5 pF
4820, 4820HT, 6120, 6120HT,	•	5 fA	< 1 pA	< 5 fA	< 10 fA	< 1 nA	< 5 nA	950 pF
4830, 4830HT, 6130, 6130HT,	•	5 fA	< 50 fA	< 5 fA	< 10 fA	< 20 fA	< 200 fA	75 pF

* using a dark box

Probe Station Specifications

Device Transport
Travel x, y: 203 mm x 203 mm (8 in. x 8 in.)
Travel z: 1 cm (3/8 in.)
Travel theta: 15°
Resolution: 0.2 µm (.008 mil)
Repeatability:< ±1 µm (0.04 mil)
Accuracy: < ± 1 µm (0.04 mil)

Platen
Vertical travel: 50.8 mm (2 in.)
Lift lever travel: 5.08 mm (0.2 in.)
Resolution: 1 µm (0.04 mil)
Repeatability: £ ±1 µm (0.04 mil)
Material: nickel-plated steel

Chuck
Size: 203 mm (8 in.) diameter
Flatness: 5 µm (0.195 mils)
Material: nickel or gold-plated

Facility Requirements
Vacuum: 400 mm (15 in.) of Hg min.
Dry air purge: (thermal systems only) 4.3 liters per sec. (9 SCFM)
Compressed air: 90 psi

Microscope Mount
Travel x-y: 25.4 mm x 25.4 mm (1 in. x 1 in). manual
Travel z: 50.8 mm (2 in.) coarse focus; fine focus 25.4 mm (1 in.)
Optional Programmable:
2 or 4 in. x, y

Controller (REL-6100 only)
ECX-56 controller with 2 ECA-53 motor drive cards for stage x, y, z, and theta movement. Up to 4 optional cards for MS1 motorized micropositioners and prog. microscope x, y, z

Temperature Range
Standard thermal chuck:
-55° to 200°C
High-temperature thermal chuck:
0° to 300°C

Interface
RS-232 and IEEE-488 standard

Regulatory Compliance
All stations conform to CE mark and are ETL listed.

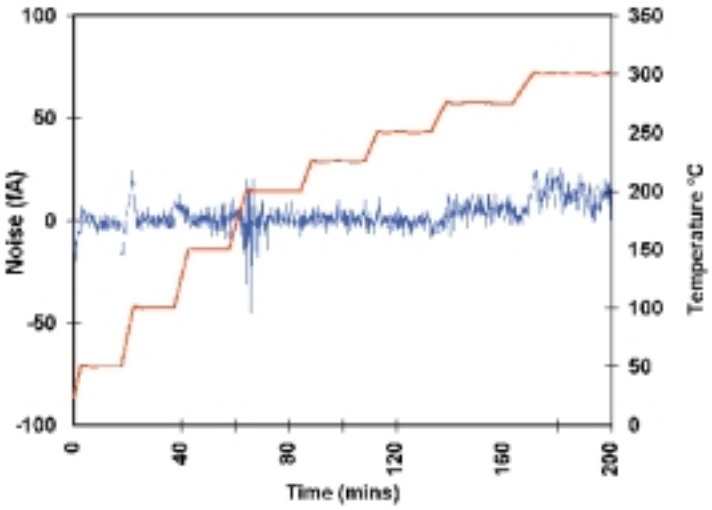
Dimensions
Standard: 73.66 cm x 63.5 cm x 53.34 cm (29 in. wide x 25 in. deep x 21 in. high) eyepieces

Additional System Components
Mitutoyo or A-Zoom Microscope Positioners and Probes

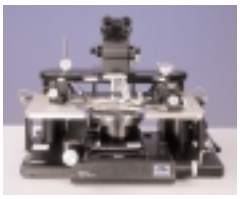
Thermal Controller
Laser and Anti-Vibration Table
Computer and Video System

For More Information

Refer to the Alessi Configuration Guide for accessories. Also refer to the Galaxy Software Data Sheet for more information on station control software.

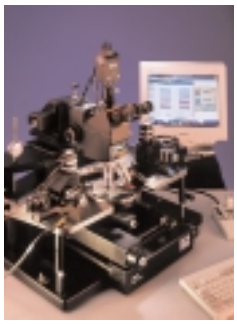


Even at 300°C the new system maintains low-noise, low-leakage performance on the chuck.



REL-4800

- 8 in. Manual
  - Non-Thermal
    - Standard — REL-4800
    - Guarded — REL-4840
  - Thermal
    - Standard — REL-4820
    - Guarded — REL-4830
  - High-Temp Thermal
    - Standard — REL-4820HT
    - Guarded — REL-4830HT



REL-6100

- 8 in. Semiauto-matic
  - Non-Thermal
    - Standard — REL-6100
    - Guarded — REL-6140
  - Thermal
    - Standard — REL-6120
    - Guarded — REL-6130
  - High Temp Thermal
    - Standard — REL-6120HT
    - Guarded — REL-6130HT

Ordering Information

8 in. manual probe station *REL-4800*

8 in. manual probe station, thermal *REL-482X*

8 in. manual probe station, high-temperature thermal *REL-482XHT*

8 in. manual probe station, guarded, thermal *REL-483X*

8 in. manual probe station, guarded high-temperature thermal *REL-483XHT*

8 in. manual probe station, guarded *REL-484X*

8 in. semiautomatic probe station *REL-6100*

8 in. semiautomatic probe station, thermal *REL-612X*

8 in. semiautomatic probe station, high-temperature thermal *REL-612XHT*

8 in. semiautomatic probe station, guarded, thermal.....*REL-613X*

8 in. semiautomatic probe station, guarded, high-temperature thermal *REL-613XHT*

8 in. semiautomatic probe station, guarded.....*REL-614X*

** X should be 1 for nickel chuck or 2 for gold chuck*

CASCADE® MICROTECH

Innovating Test Technologies™ for better measurements faster

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