Attachment A: cryogen-free dilution refrigerator and magnet system for electrical transport measurements of semiconductor nanostructures.

Purpose:
This specification defines the requirements for a cryogen-free dilution refrigerator and magnet system for electrical transport measurements of semiconductor nanostructures. This cryogen-free dilution refrigerator will be used at Sandia National Laboratories, New Mexico in support of Sandia National Laboratories' R&D programs.

Equipment Characteristics/ Specifications:

- The dilution refrigerator shall be a cryogen free design that does not require liquid helium transfers.
- The cooling power at 100 milliKelvin shall be 200 microWatts or higher.
- The base temperature shall be 20 mK or lower.
- A 2" bore superconducting magnet with a maximum field in the range of 9 to 12 Tesla is required.
- The superconducting magnet shall have a persistence switch fitted.
- A sample space diameter of 40 mm or more is required.
- There shall be 12 twisted pair wiring for electrical measurement (24 wires), and there shall be space and additional feed-throughs available to add additional wiring in the future.
- All necessary gas panels, temperature controllers, diagnostic thermometers, pumps and other equipment needed to run the cryostat shall be included.
- Ability to customize wiring and include rf-components and other heat generating components at intermediate temperature stages between room and base temperature.
- Delivery before 9/1/2011.
- Drawings and manuals (1 hard copy) list of operation, instruction, service and maintenance shall be provided two (2) months prior to installation.
- System shall include a complete set of standard spare parts
- Standard software to control system shall be included
- Installation & Training included
    a. Installation will be on site at Sandia National Laboratories, Albuquerque, NM
    b. Vendor shall supply personnel for installation of all equipment supplied
    c. Post-installation support including on-site service must be available.
- Acceptance- on-site demonstration of base temperature, cooling power and maximum magnetic field is required.

Evaluation committee:
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