List of Specifications for High Power SOLAR SIMULATOR:

1. Xenon lamp based solar simulator capable of delivering 700 kilo-Watts/m^2 of optical power over a minimum 9 cm diameter beam spot.
    a. 700 kilo-Watts/m^2 is based on an integrated power over the wavelength range of 250 nano-meter to 2500 nano-meter.
    b. Either direct intensity measurements of the delivered system, or scientific documentation of the intensity of a comparable system, shall be provided.
2. Solar Simulator output shall illuminate a target in a vacuum chamber through a vacuum window(s) at a target distance of a minimum of 45 inches (114 cm) and a maximum of 57-inches (145 cm) from the vacuum chamber window(s). See attached sketch.
    a. The diameter of the vacuum chamber window shall be a maximum of 7.5-inches (19 cm).
    b. No more than three individual vacuum windows may be used to apply the required optical power to target.
3. System shall include all support and mounting hardware to point the lamps and reflectors into the vacuum chamber.
    a. The mounting and support hardware shall be designed to point the lamp assemblies in a horizontal orientation (i.e. parallel to laboratory floor). Lamp assemblies can be oriented at an angle not to exceed 20 degrees off the horizontal.
4. System shall be comprised of no more than four (4) Xenon Short-Arc Lamps arranged in a spherical array.
    a. Individual lamp power shall not exceed 6.5 kilo-Watts
5. Reflectors used around an individual lamp must incorporate an elliptical geometry to collect and focus the light
    a. A spare reflector shall be provided.
6. System shall allow for a minimum of 8 mm adjustments of lamp position in a given reflector
7. System shall be capable of continuous operation over a minimum period of 10 hours
8. 5% Beam Stability over 10 hour period
9. Individual lamp assemblies shall include all power supplies, igniter circuit, and wiring for each.
    a. System shall include all necessary power supplies.
        i. All supplies shall be high efficiency switching type
        ii. All supplies shall be capable of operation at 208 Volts AC 60 Hertz
        iii. All supplies should be capable of operating on a 3-Phase 3-wire (plus ground) system
        iv. All supplies shall be capable of remote operation via computer (analog and/or digital control)
        v. All supplies shall display output current and voltage.
    b. System shall include all cabling required to interface the power supplies to the Xenon Arc lamps.
    c. System shall include necessary support structure to mount and hold the Xenon lamp and reflector assemblies.
        i. Lamp support structure shall allow for adjustment of lamp-reflector assemblies yaw and pitch.
    d. System shall include necessary circuitry to start Xenon Arc Lamps

i. Arc start circuitry shall include protection for the lamp power supplies to avoid damage from high voltage pulses.

10. A complete set of operating manuals and electrical drawings is required.
11. Vendor shall provide evidence of experience in manufacturing and delivering multi-kilowatt Xenon arc lamp systems consisting of multiple lamps in a single system.
12. Delivery of complete system no later than 16 weeks after receipt of order.