



University of South Carolina

Purchasing Department
1600 Hampton Street, 6th floor
Columbia, SC 29208
Telephone: (803) 777-4115

Request for Quotation

Page One

THIS IS NOT AN ORDER

Quotation must be received No Later Than: 11:30 AM	Send quotation to above address Attention of:	Quotation Number:	Date	
2 4 2009	Lana Widener	USC-RFQ-1408-LW	1 23 2009	

Print company name and address:

Please quote your lowest delivered price of the item(s) listed below. The Purchasing Department reserves the right to reject any or all quotes and to waive any or all technicalities.

1. If an item cannot be furnished, indicate by **NO QUOTE**.
2. All quotes must be signed by the vendor's representative and terms noted, failure to comply with this instruction may result in disqualification of the quote.
3. **FAXED QUOTES ACCEPTABLE.** FAX # (803) 777-2032

If the product preference is applicable follow these instructions:

Check (X) on the appropriate line: SC End Product _____ US End Product _____ **and** indicate by asterick (*) next to the item number on the bid schedule which preference applies.

NON-RESIDENT VENDORS ONLY: Yes _____ No _____ We have read and applied for (or already have) a non-resident taxpayer affidavit (I-312).

RESIDENT VENDOR PREFERENCE: Yes _____ No _____ SC Resident Vendor Preference as defined in Section 11-35-1524 of the SC Consolidated Procurement Code.

Federal I.D. or Social Security No. _____ SC Minority Certification Number (If Applicable) _____

Submitted By (Print Name) _____ Signature _____ Telephone _____

Item No.	Quantity and Unit	Description of Commodity or Services	Unit Price	Total Price
1.00	LOT	Furnish and deliver new power inverter and transfer switch for proposed fuel cell installation. MS Series Power Inverter, 6KW N+1, redundant 3-phase (2KW N+1 per phase), expandable to 3KW N+1 phase, 48 Vdc input, 120/208 Vac / 60 HZ output, line to neutral: 120 Vac, line to line: 208Vac, Transfer Switch, MBS: Maintenance Bypass Switch, 19" Cage (continued on page two)		\$ _____

NOTE: The specifications listed herein are not to be considered restrictive to one source of supply. However, items offered must be equal in quality and performance. The offeror must include with his bid/quote supporting product data sufficient for the University to determine equality and acceptability. The right is reserved to reject any offering in which the items offered are considered unsatisfactory in any manner. The University will determine if minor deviations from the listed features are acceptable. (SPT052)

Award will be made to one vendor for the entire quantity. (SPM034)

Deliveries shall be FOB Destination, freight prepaid (SPM055)

Bid Only As Specified. (SPT510)

Questions: Direct all questions in writing to Lana Widener.

Contact Person: Lana Widener

llw@sc.edu

803-777-7776

INVERTER SYSTEM (For Equipment only)**PART 1 - GENERAL****1.1 SUMMARY**

- A. This Section includes inverter the following features:
1. DC to AC inverter modules.
 2. maintenance bypass/isolation switch.
 3. 120/208 volt AC output voltages.
 4. Transfer switch for connection to utility power.
 5. Remote monitoring provisions.

1.2 DEFINITIONS

- A. LCD: Liquid-crystal display.
- B. LED: Light-emitting diode.
- C. THD: Total harmonic distortion.

1.3 SUBMITTALS

- A. Product Data: For the following:
1. Electrical ratings, including the following:
 - a. Capacity to provide power in kilowatts.
 - b. Inverter voltage regulation and THD of output current.
 - c. Rectifier data.
 - d. Transfer time of transfer switch.
 - e. Data for specified optional features.
 2. Transfer switch.
 3. Maintenance Bypass Switch
 4. Inverter.
- B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, components, and location and identification of each field connection. Show access, workspace, and clearance requirements; details of control panels; and battery arrangement.
1. Wiring Diagrams: Detail internal and interconnecting wiring; and power, signal, and control wiring.
 2. Elevation and details of control and indication displays.
 3. Transfer switch details and connections
 4. Maintenance bypass switch details and connections.
- C. Manufacturer Seismic Qualification Certification: Submit certification that central battery inverter equipment will withstand seismic forces defined in Division 16 Section "Vibration

and Seismic Controls for Electrical Systems" Include the following:

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 - a. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."
 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- D. Qualification Data: For testing agency.
- E. Source quality-control test reports.
- F. Field quality-control test reports.
- G. Operation and Maintenance Data: For central battery inverter equipment to include in emergency, operation, and maintenance manuals.
- H. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of the InterNational Electrical Testing Association or is an NRTL acceptable to authorities having jurisdiction.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Inverter System: UL listed.
- D. Comply with NFPA 70 and NFPA 101.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver equipment in fully enclosed vehicles.
- B. Store equipment in spaces having environments controlled within manufacturers' written instructions for ambient temperature and humidity conditions for non-operating equipment.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace equipment that fail in materials or workmanship within specified warranty period.

PART 2 - PRODUCTS

2.1 INVERTER PERFORMANCE REQUIREMENTS

- A. Configuration:
 - 1. 6KW N+1, redundant 3-phase (2KW N+1 per phase), expandable to 3KW N+1 per phase with automatic transfer switch and maintenance bypass, MX Series Catalog number S31AW00CC034621 manufactured by Exeltech, Inc. or approved equal.
- B. DC Input, Inverter
 - 1. Voltage Configuration:
 - a. 48 VDC input
- C. AC Output, Inverter
 - 1. Voltage Configuration:
 - a. 120/208 VAC nominal, 60 Hz, three-phase, 4-wire-plus-ground
 - 2. Voltage Regulation: $\pm 3\%$ steady state, $\pm 7\%$ steady state with optional transformer.
 - 3. Frequency Regulation:
 - a. 60Hz Nominal: $\pm 5\%$ Synchronized to utility.
 - b. ± 0.1 Hz free running or on battery operation.
 - 4. Frequency Slew Rate: 1.0 Hz per second maximum.
 - 5. Voltage Distortion:
 - a. $\leq 4\%$ total harmonic distortion (THD) typical into a 100% linear load, $\leq 7\%$ THD typical into a 100% non-linear load with crest factor ratio of 3:1.
 - 6. Load Power Factor Range: 0.65 lagging to 1.0 (unity).
 - 7. Output Power Rating: Rated VA at 0.7 lagging power factor.
 - 8. Inverter Overload Capability: 112 - 130% of full load for 10 seconds, 131 - 200% of full load for 8 cycles. Automatic transfer to bypass shall occur if these parameters are exceeded.
 - 9. Voltage Transient Response: $\pm 11\%$ maximum in line mode, $\pm 15\%$ maximum in battery mode for any load step up to and including 100% of rated load.
 - 10. Transient Recovery Time: To steady state output voltage within 90 milliseconds.
- D. Fast-Transfer Inverters: Automatically sense loss of normal ac supply and use a solid-state switch to transfer loads. Transfer in 0.004 second or less from normal supply to battery-inverter supply.
 - 1. Operation: Unit supplies power to output circuits from a single, external, fuel cell source. Unit automatically transfers load from fuel cell to utility source in the event that the fuel cell shuts down. Retransfer to fuel cell is automatic when fuel cell power is restored.
- E. Maximum Acoustical Noise: 60 dB, "A" weighting, emanating from any component under any condition of normal operation, measured 39 inches from nearest surface of component enclosure.

2.2 SERVICE CONDITIONS

- A. Environmental Conditions: Inverter system shall be capable of operating continuously in

the following environmental conditions without mechanical or electrical damage or degradation of operating capability:

1. Ambient Temperature for Electronic Components: 32 to 98 deg F.
2. Relative Humidity: 0 to 95 percent, noncondensing.
3. Altitude: Sea level to 4000 feet.

2.3 INVERTERS

A. Description: Inverter Module Solid-state type, with the following operational features:

1. Automatically regulate output voltage to within plus or minus 5 percent.
2. Automatically regulate output frequency to within plus or minus 1 Hz, from no load to full load at unit power factor over the operating range of battery voltage.
3. Output Voltage Waveform of Unit: Sine wave with maximum 10 percent THD throughout battery operating-voltage range, from no load to full load.
 - a. THD may not exceed 5 percent when serving a resistive load of 100 percent of unit rating.
4. Output Protection: Current-limiting and short-circuit protection.
5. Output Protection: Ferroresonant transformer to provide inherent overload and short-circuit protection.
6. Overload Capability: 125 percent for 10 minutes; 150 percent surge.
7. Brownout Protection: Produces rated power without draining batteries when input voltage is down to 75 percent of normal.

2.4 TRANSFER SWITCH

A. Description: Transfer Switch Module provides a relay to transfer AC power to the load, from either the inverter or the utility input. Also provides alarm output contacts via LED's and alarm contact closures.

2.5 CONTROL MODULE

A. Description: Control Card Module provides all control signals necessary to operate the inverters modules.

2.6 ENCLOSURES

- A. All modules shall be installed in a standard 19" equipment rack.
- B. Finish: Manufacturer's standard baked-enamel finish over corrosion-resistant prime treatment.

2.7 SEISMIC REQUIREMENTS

A. Inverter assemblies, subassemblies, components, fastenings, supports, shall be designed and fabricated to withstand seismic forces. The term "withstand" is defined in the "Manufacturer Seismic Qualification Certification" Paragraph in Part 1 "Submittals" Article.

2.8 CONTROL AND INDICATION

- A. Description: Group displays, indications, and basic system controls on common control panel on front of central battery inverter enclosure.
- B. Minimum displays, indicating devices, and controls shall include those in lists below. Provide sensors, transducers, terminals, relays, and wiring required to support listed items. Alarms shall include an audible signal and a visual display.
- C. Indications: Labeled LED.
 - 1. Quantitative Indications:
 - a. Input voltage, each phase, line to line.
 - b. Input current, each phase, line to line.
 - c. System output voltage, each phase, line to line.
 - d. System output current, each phase.
 - e. System output frequency.
 - f. DC bus voltage.
 - g. Battery current and direction (charge/discharge).
 - h. Elapsed time-discharging battery.
 - 2. Basic Status Condition Indications:
 - a. Normal operation.
 - b. Load-on bypass.
 - c. Load-on battery.
 - d. Inverter off.
 - e. Alarm condition exists.
 - 3. Alarm Indications:
 - a. Battery system alarm.
 - b. Control power failure.
 - c. Fan failure.
 - d. Overload.
 - e. Battery-charging control faulty.
 - f. Input overvoltage or undervoltage.
 - g. Approaching end of battery operation.
 - h. Battery undervoltage shutdown.
 - i. Inverter fuse blown.
 - j. Inverter transformer overtemperature.
 - k. Inverter overtemperature.
 - l. Static bypass transfer switch overtemperature.
 - m. Inverter power supply fault.
 - n. Inverter output overvoltage or undervoltage.
 - o. System overload shutdown.
 - p. Inverter output contactor open.
 - q. Inverter current limit.
 - 4. Controls:

- a. Inverter on-off.
 - b. Start.
 - c. Battery test.
 - d. Alarm silence/reset.
 - e. Output-voltage adjustment.
- D. Dry-form "C" contacts shall be available for remote indication of the following conditions:
 - 1. Inverter on battery.
 - 2. Inverter on-line.
 - 3. Inverter load-on bypass.
 - 4. Inverter in alarm condition.
 - 5. Inverter off (maintenance bypass closed).
- E. Include the following minimum array:
 - 1. Ready, normal-power on light.
 - 2. Charge light.
 - 3. Inverter supply load light.
 - 4. Battery voltmeter.
 - 5. AC output voltmeter with minimum accuracy of 2 percent of full scale.
 - 6. Load ammeter.
 - 7. Test switch to simulate ac failure.
- F. Enclosure: Steel, with hinged lockable doors, suitable for wall mounting. Manufacturer's standard corrosion-resistant finish.

2.9 MAINTENANCE BYPASS SWITCH

- A. Maintenance Bypass/Isolation Switch: Switch is interlocked so it cannot be operated unless static bypass transfer switch is in bypass mode. Switch provides manual selection among the following three conditions without interrupting supply to the load during switching:
 - 1. Full Isolation: Load is supplied, bypassing central battery inverter system. Normal ac input circuit, static bypass transfer switch, and central battery inverter load terminals are completely disconnected from external circuits.
 - 2. Maintenance Bypass: Load is supplied, bypassing central battery inverter system. Central battery inverter ac supply terminals are energized to permit operational checking, but system load terminals are isolated from the load.
 - 3. Normal: Normal central battery inverter ac supply terminals are energized and the load is supplied either through static bypass transfer switch and central battery inverter rectifier-charger and inverter or through battery and inverter.

2.10 SYSTEM MONITORING AND ALARMS

- A. Remote Status and Alarm Panel: Labeled LEDs on panel faceplate shall indicate five basic status conditions. Audible signal indicates alarm conditions. Silencing switch in face of panel silences signal without altering visual indication.

1. Cabinet and Faceplate: Surface or flush mounted to suit mounting conditions indicated.
- B. Provisions for Remote Computer Monitoring: Communication module in unit control panel provides capability for remote monitoring of status, parameters, and alarms specified in Part 2 "Control and Indication" Article. Remote computer and connecting signal wiring will be provided by Owner. Include the following features:
 1. Connectors and network interface units or modems for data transmission via RS-232 link.
 2. Software shall be designed to control and monitor inverter system functions and to provide on-screen explanations, interpretations, diagnosis, action guidance, and instructions for use of monitoring indications and development of reports. Include capability for storage and analysis of power-line transient records.
- C. Battery Ground-Fault Detector: Initiates alarm when resistance to ground of positive or negative bus of battery is less than 5000 ohms.
 1. Annunciation of Alarms: At inverter system control panel.

2.11 SOURCE QUALITY CONTROL

- A. Factory test complete inverter system before shipment. Include the following:
 1. Functional test and demonstration of all functions, controls, indicators, sensors, and protective devices.
 2. Full-load test.
 3. Transient-load response test.
 4. Overload test.
 5. Power failure test.
- B. Observation of Test: Give 14 days' advance notice of tests and provide access for Owner's representative to observe tests at Owner's option.
- C. Report test results. Include the following data:
 1. Description of input source and output loads used. Describe actions required to simulate source load variation and various operating conditions and malfunctions.
 2. List of indications, parameter values, and system responses considered satisfactory for each test action. Include tabulation of actual observations during test.
 3. List of instruments and equipment used in factory tests.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including

connections. Report results in writing.

- B. Perform tests and inspections and prepare test reports.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- C. Tests and Inspections:
 - 1. Inspect interiors of enclosures for integrity of mechanical and electrical connections, component type and labeling verification, and ratings of installed components.
 - 2. Test manual and automatic operational features and system protective and alarm functions.
 - 3. Test communication of status and alarms to remote monitoring equipment.
 - 4. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specifications. Certify compliance with test parameters.
 - 5. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Remove and replace malfunctioning units and retest as specified above.

3.2 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
- B. Verify that the inverter system is installed and connected according to the Contract Documents.
- C. Verify that electrical wiring installation complies with manufacturer's submittal and installation requirements in Division 26 Sections.
- D. Complete installation and startup checks according to manufacturer's written instructions.

3.3 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain inverter system.
- B. END OF SECTION

GENERAL CONDITIONS

DEFAULT: In case or default by the Contractor, the University of South Carolina reserves the right to purchase any or all items in default in the open market, charging the Contractor with any additional costs. The defaulting Contractor shall not be considered a responsible bidder until the assessed charge has been satisfied.

All amendments to and interpretation of this RFQ shall be in writing. The procurement officer shall not be legally bound by any amendment or interpretation that is not in writing.

SC/US PREFERENCE: In order to receive the South Carolina/United States made, manufactured or grown end-product preference, you must check the appropriate space (s) provided on the face of the quotation form. This preference does not apply to services.

Any contract entered into by the University of South Carolina or its agencies resulting from this quotation shall be subject to cancellation at the end of any fiscal or appropriated year unless otherwise provided by law.

Payment will be made in accordance with Section 11-35-45 of the South Carolina Consolidated Procurement Code and Disbursement Regulations. Delay in receiving invoices, as well as errors and omissions on the invoices, will be considered just cause for withholding payment without losing discount privileges. The University reserves the right to withhold payment or make such deductions as may be necessary to protect the University from loss or damage because of defective work, claims, damages or to pay for repair of correction of materials furnished hereunder.

Quoted prices must remain firm for a period of thirty days beyond the Request for Quotation deadline. Unit prices will govern over extended prices unless otherwise stated.

The University of South Carolina shall consider payment discounts in the award of this contract when such discounts are for thirty days or more after final inspection and acceptance of contract requirements. Payment discounts for less than thirty days are encouraged but shall not be a factor in award determination. Please state your discount terms using the above referenced information as the University's position on the matter.

All materials and products offered must be guaranteed to meet and comply with the requirements all the specifications, terms and conditions indicated or referred to.

The award will be made in accordance with Section 11-35-1520 of the South Carolina Consolidated Procurement Code.

The University reserves the right to reject any and all quotations and to cancel the solicitation; waive any and all technicalities; the University reserves the right to reject any quotation in which the delivery time indicated to be of substantial length to cause disruption and/or delay in operation for which the item(s) is/are intended; ambiguous quotations which are uncertain as to terms, delivery, quantity or compliance with specifications may be rejected.

The successful contractor assumes sole responsibility and shall hold harmless the University of South Carolina, its directors, officers, employees and agents from and against any and all claims, actions or liabilities of any nature which may be asserted against them by third parties in connection with the performance of the successful bidder, its directors, officers, employees and agents under this agreement. The University of South Carolina agrees to accept responsibility for claims, actions or liabilities resulting from negligent acts of its employees occurring within the scope of their employment which may be asserted against them by third parties in connection with the performance of the University of South Carolina, its members, directors, officers, employees and agents under this agreement.

Contractor agrees not to refer to award of this contract in commercial advertising in such a manner to state or imply that the products or service provided are endorsed or preferred by the user.

Upon award of a contract under this quotation, the person, partnership, association or corporation to whom the award is made must comply with the laws of South Carolina that require such person or entity to be authorized and/or licensed to do business in this State. Notwithstanding the fact that applicable statutes may be exempt or exclude the successful quoter from requirements that it be authorized and/or licensed to do business in this State, by submission of this signed quote, the quoter agrees to subject itself to the jurisdiction and process of the courts of the State of South Carolina as to all matters and disputes arising or to arise under the contract and the performance thereof, including any questions as to the liability for taxes, licenses or fees levied by the State.

Termination: Subject to the provisions below, the contractor may be terminated for any reason by the University providing a thirty-day advance notice in writing is given to the contractor.

Termination for Convenience: In the event that this contract is terminated or cancelled upon request and for the convenience of the University may negotiate reasonable termination costs, if applicable.

Termination for Cause: Termination by the University for cause, default, or negligence on the part of the Contractor shall be excluded from the foregoing provisions; termination costs, if any, shall not apply. The thirty day advance notice requirement is waived and the default provision in this bid shall apply.

HIPAA Law: The Contractor agrees that to the extent that some or all of the activities within the scope of this Contract are subject to the Health Insurance Portability Accountability Act of 1996, P.L. 104-91, as amended ("HIPAA"), or its implementing regulations, it will comply with the HIPAA requirements and will execute such agreements and practices as the University of South Carolina may require to ensure compliance. Additional information may be viewed at: <http://www.sc.edu/hipaa/>

SPECIAL CONDITIONS

LICENSES, PERMITS, INSURANCE: All costs for required licenses, permits and insurance shall be borne by the Bidder.

The University of South Carolina requires all contractual activities to be performed in a manner that is consistent with all applicable federal, state and local laws, regulations, rules, rulings and ordinances. These include, but are not limited to: the Occupational safety and Health Act, The Environmental Protection Act, The South Carolina Hazardous Waste Management Act.

IMPORTANT – Please Note

Vendors, we MUST have your Federal ID # (company) or Social Security # (individual) before processing any invoices for payment. Failure to provide this information will result in delay of payments until this information is received. Please include this information with your quote.