



INDIAN INSTITUTE OF TECHNOLOGY MADRAS
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Prof. Aravind Kumar Chandiran
Project Coordinator

Ref: CH/2019/ARAK/Battcycler
Dated: 01.01.2020

Limited Tender No: CH/2019/ARAK/Battcycler

Due Date: 22.01.2020, 3:00pm

Pre-Bid meeting: - Not required.

Bid opening meeting on Due Date: 22.01.2020, 4:00pm

Dear Sir/Madam,

On behalf of the Indian Institute of Technology Madras, offers are invited for the supply of “**HIGH CURRENT BATTERY CYCLER**” conforming to the specifications given in(Annexure-I).

Terms and Conditions of Limited Tender

- 1. Preparation of Bids:** - The Limited tenders should be submitted under **Two bid system** (i.e.) Technical- and -Financial bid.
- 2. Delivery of the tender:** - The tender shall be sent to the below-mentioned addresses either by post or by courier (duly sealed and super scribed on the envelope with the reference No and due date) so as to reach the following address before the due date and time specified in our Schedule:
**Prof. Aravind Kumar Chandiran,
Department of Chemical Engineering
IIT Madras
Chennai - 600 036.**
- 3. Price:** - The price should be quoted in net per unit (after breakup) and must include all packing and delivery charges to **Department of Chemical Engineering.**
 - a. The offer/bid should be exclusive of taxes and duties. The percentage of tax & duties should be clearly indicated separately. IIT Madras is eligible for concessional GST and relevant certificate will be issued.
 - b. In case of import supply, the price should be quoted without custom duty. IIT Madras is exempted from levy of IGST on Imports and eligible for concessional custom duty (not exceeding 5%) and the price should be quoted on EX-WORKS and CIP (stating the Cost, Insurance, Freight separately) and indicating the mode of shipment.
- 4. Terms of Delivery:** - The item should be supplied to our Departments as per Purchase Order. In case of import supply, the item should be delivered at the cost of the supplier to our Institution. The Installation/Commissioning should be completed as specified in our important conditions.
- 5. Catalogue:** Original catalogue (not any photocopy) of the quoted model duly signed must accompany the quotation in the Technical-cum-financial bid
- 6. Late offer:** - The offers received after the due date and time will not be considered

7. **Payment:** - No Advance payment will be made for Indigenous purchase. However, 90% Payment against Delivery and 10% after installation are agreed to wherever the installation is involved. In case of import supplies the payment will be made only through 100% Letter of Credit i.e. (90% payment will be released against shipping documents and 10% after successful installation wherever the installation is being done).
8. **Advance Payment:** - No advance payment is generally admissible. In case of specific percentage of advance payment is required, the Foreign Vendor has to submit a Bank Guarantee equal to the amount of advance payment and it should be routed through the Beneficiary Bank to the end user Bank. Otherwise, the Indian Agent of the foreign vendor has to submit a Bank Guarantee through a Nationalized Bank of India.
9. **On-site Installation:** - The equipment or machinery has to be installed or commissioned by the successful bidder within number of days (as prescribed by PI's) from the date of receipt of the item at site of IIT Madras.
10. **Warranty/Guarantee:** - The offer should clearly specify the warranty or guarantee period for the machinery/equipment.
11. **Validity:** Validity of Quotation not less than 60 days from the due date of tender
12. **Technical Bid Opening:** The technical bid will be opened on **22.01.2020, 4:00pm** at the Department of Chemical Engineering, IIT Madras and the **financial bids** of those tenders who are technically qualified will be opened at a **later date under intimation to them.**
13. **Performance Security:-**The successful bidder should submit Performance Security for an amount of 5% of the value of the contract/supply within 21 days from the issue of work/purchase order. The Performance Security should be furnished in the form of an Account Payee DD / FD Receipt from the commercial bank (or) Bank Guarantee from any nationalized bank in India.
14. **Accept /Reject:** IIT Madras reserves the full right to accept / reject any tender at stage without assigning any reason.
15. **Settlement of Disputes:** Any legal disputes arising out of any breach of contract pertaining to this tender shall be settled in the court of competent jurisdiction located within the city of Chennai in Tamil Nadu.
16. **Risk Purchase Clause:** - In the event of failure of supply of the item/equipment within the stipulated delivery schedule, the purchaser has all the right to purchase the item/equipment from other sources on the total risk of the supplier under risk purchase clause.
17. **Unsolicited offers:** "This notice is being published **for information only** and is not an open invitation to quote in this limited tender. Participation in this tender is by invitation only and is limited to the selected registered suppliers. Unsolicited offers are liable to be ignored. However, suppliers who desire to participate in such tenders in future may apply for registration as per procedure." The Website for Registration of vendors is <http://web.iitm.ac.in/supplier/> and the mail address for queries is "workflow@rt.iitm.ac.in".

Yours sincerely,

Prof. Aravind Kumar Chandiran,
Department of Chemical Engineering
IIT Madras
Chennai - 600 036.

ANNEXURE – I

IIT Madras proposes to procure an eight channel high current battery cyler for their research on metal-air batteries. The following technical specifications should be complied with completely to qualify the technical bid. A detailed technical compliance statement should be provided and manufacturer's product brochure should support it. Information provided in vendor/supplier/redistributor/reseller's website cannot be considered as a supporting document.

Technical Specifications

1. Number of channels required – 8
2. All channels should be capable operating in-parallel and should be able to control with a single software and computer.
3. Voltage specifications
 - a. Voltage range: 0 V to 5 V or better.
 - b. Measurement resolution should be 24 bit or better to attain 1 μ V resolution
 - c. Measurement precision should be 100 ppm or better.
 - d. Voltage control accuracy should be 0.02% FSR
 - e. Input impedance should be at least 10G Ω for better voltage measurement accuracy
4. Current specifications
 - a. Should operate at least with current ranges between 10A and 1mA.
 - b. At least four current ranges should be available between 10A and 1mA.
 - c. Measurement resolution should be 24 bit or better.
 - d. Current control accuracy should be 0.02% FSR with at least \pm 5mA at 10 A and \pm 0.5 μ A at 1 mA.
 - e. Minimum voltage that can be measured at maximum current should be 0V. This specification is very important as we may discharge our batteries down to 0V.
 - f. Current rise should happen within 0.1 ms or better.
 - g. Continuous power output should be 50W or better.
5. Time
 - a. Minimum step time should be 5 ms or better to log at least 2000 points per second per channel.
 - b. Measurement resolution should be 100 μ s or better.
6. The entire system should be air cooled with fans inside the cyler.
7. Paralleling option with all eight channels should be possible to operate the battery at high currents.
8. The instrument should have provision to upgrade for Electrochemical Impedance measurements that can operate at least between 1 MHz and 500 mHz. All the battery channels should share a single EIS system to operate in multiplexing mode for all the frequency ranges given above.
9. USB interface or ethernet should be provided to communicate with PC
10. A data acquisition system with all the computing facilities for controlling and collecting data from the battery cyler should be provided.
11. Software
 - a. All eight channels should be controlled independently using a single software

- b. All eight channels should be able to operate in parallel and any of channels should be able to operate at any current/voltage ranges simultaneously.
 - c. Should be able to operate in constant current, constant voltage, constant power and at any given C-rate.
 - d. Should be able to use user defined power profiles or current profiles to test batteries in real time conditions.
12. Minimum two years onsite warranty from the date of installation of the products.
13. Optional components: Accessories including auxiliary voltage measurement, auxiliary temperature measurements, auto calibration options, EIS module and any additional accessories available for the quoted product shall be quoted under the optional category.
14. The vendor should have supplied at least one similar instrument in India in the past two years. List of their customers and their contact details should be provided. IIT-Madras shall inquire the bidders' customers about the quality of product/service. If the testimonial from their customers is not satisfactory, IIT-Madras reserves the right to reject the bid based on technical grounds.