

INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE
2A & 2B, Raja S.C.Mullick Road, Jadavpur, Kolkata-700032

Tender Notice No: IACS/CSS/SR/22-23/51

Date: 27/12/2022

Sealed tender in two bids system (technical bid and price bid) is invited from bonafide, resourceful and eligible manufacturer/exclusive distributor/vendors for the purchase of **Low temperature superconducting magnet based measurement system** at IACS.

Part-I (Technical Bid) of the tender should contain technical specifications in detail as well as commercial terms and conditions. Part-II (Price Bid) should clearly indicate group-wise price, if needed, as mentioned in the technical bid. The Technical Bid and Price Bid are to be submitted in separately sealed envelopes, distinctly marked accordingly and both to be put inside another envelop, that should be sealed and superscribed with tender notice no. and due date. The bidders may submit bids duly signed in their own letterheads.

Completed tender bids should reach the office of the **Registrar, Indian Association for the Cultivation of Science (IACS), 2A & 2B Raja S. C. Mullick Road, Jadavpur, Kolkata-700032** on or before the scheduled date and time specified below:

Tender Notice No.	Tender Notice No: Date:
Last date and time of submitting tender	27/01/2023, 12 noon
Pre-bid meeting to discuss technical specification	10/01/2023, 03.00 PM
Date and time of opening tender	28/01/2023 at 3.00 PM
Place of opening tender	Will be notified
Contact	Prof. Sugata Ray Email: mssr@iacs.res.in Tel.+91 33 2473 4971 [Extn. 1226]

The technical bids will be opened first to judge/evaluate the technical specifications of the said instrument and thereafter the price bids of only technically qualified bidders will be opened.

Technical Bid Evaluation: The Technical Bids will be evaluated in the presence of the representatives of intending bidders who will be able to clarify technical aspects of their bids, if any, required by the Technical Evaluation Team.

Opening of price-bid: The Price Bids of the bidders qualifying the technical bid will only be opened, the date of which will be intimated to the short-listed bidders at their email addresses. The rest of the bids will be rejected.

Please note that IACS will not provide any accommodation or reimburse any expenses to any of the bidders for attending opening of technical bid.

Quotations received incomplete or beyond the stipulated time will be summarily rejected.

Bidders should submit their past experience for supplying and successful installation of similar **Low temperature superconducting magnet based measurement system** to other research Institutes/Universities/other organizations in India and abroad. Please provide documentary proofs of such successful installation and supportive documents that the instruments are running successfully.

1. TECHNICAL BID

The technical bid should contain technical specifications and should be kept in a separate sealed envelope duly super scribed as 'TECHNICAL BID' on the outer cover of the envelope as already detailed above. It should be clearly mentioned on the envelope as "Technical Specification for **Low temperature superconducting magnet based measurement system**".

Technical Specification for Low temperature superconducting magnet based measurement system:

All the committee members have carefully discussed the required parameters of a cutting edge "**Low temperature superconducting magnet based measurement system**" as well as the requirements of the scientists of IACS and finalized on the following technical specifications to be included in the tender notice.

Basic System & Cryogenic specifications:

- Computer controlled cryogen-free high magnetic field low temperature superconducting magnet based measurement system (SQUID magnetometer) with working temperature range (2 K - 400 K) for holding DC magnetization and AC susceptibility measurement options at variable magnetic fields and temperatures for different kind of samples in polycrystalline, single crystal and thin film forms.
- System must accomplish the initial cool-down directly from He gas (without any cryogen) within 45 hours (maximum). The vendor should provide supporting data and cool-down log files with the offer. Demonstration may be asked during technical evaluation.
- Single two-stage Pulsed tube cryocooler is required to cool both the superconducting magnet and the sample chamber. Only small amount of Helium gas is to be used for its fully automated startup and operation. The maximum quantity of liquid helium collected through condensation of the helium gas should be preferably <20 liters when the system is operating at its full capacity in order to ensure minimum He loss during a system failure. Vendor must mention the He reservoir capacity.
- Cooldown should be totally automated without the need of any kind of manual intervention. It should be automated, integrated, user friendly and the pump system should be assembled within the basic system.

- In the basic system, there should be options for upgradation so that measurements can be extended to lower/higher temperature, pressure and also for vibrating sample measurements.

A. Magnet Control Specifications:

- Superconducting magnet with longitudinal field in the range of ± 7 T or higher.
- Field uniformity should be $\pm 0.01\%$ over at least 4 cm.
- Remanent field: 5 Oe or less when oscillating from full field to zero. Supporting data with log data files should be provided. The system may have compensatory coil/magnet quenching facility to minimize the remanent field.
- System must achieve zero field to longitudinal 7 tesla in < 2 minutes. Provide supporting data with log data files with the offer. Demonstration should be asked during technical evaluation.

B. Temperature Control Specifications:

- Temperature range must be available from ≤ 1.8 K to ≥ 400 K for all the measurements.
- For controlled cooling, the rate should be 10 K/min or above, while maximum uncontrolled cooling rate should be 25 K/min or more. The vendor should provide supporting data with data files with the offer.
- The sample temperature should reach from 300 K to stable 10 K within 20 minutes while uncontrolled cooling. Similarly, 10 K to stable 1.8 K temperature must be achieved in less than 10 minutes. The vendor is required to provide supporting data along with data files. Demonstration will be asked during technical evaluation.
- System must feature a finely tuned flow impedance along with sophisticated temperature control software to allow continuous operation at 1.8 K as well as smooth temperature control through the 4.2 K liquid helium boiling point.
- System should not use any inefficient techniques like mechanical needle valve adjustments to achieve low temperature.
- At least three temperature sensors should be available in the sample chamber of the basic system to ensure sample temperature accuracy and stability.
- System temperature stability must be $\pm 0.5\%$ or better. Vendor must provide the temperature stability data at 1.8 K for minimum 48 hours with supporting data files. Demonstrations will be asked during technical evaluation.

C. DC Measurement Mode:

- System should offer DC magnetization measurements mode where the sample is scanned up and down at constant speed and the SQUID signal is obtained as a function of position and time.
- DC measurement temperature range should be from 1.8 K to 400 K.
- The sensitivity of the DC magnetization should be such that a moment as low as $\leq 5 \times 10^{-8}$ emu at zero to ≤ 2500 Oe can be measured. For the full range of field, the above sensitivity should be at least 6×10^{-7} emu or better in the DC Mode. Vendor must provide supporting data with log data files.
- Vendor must provide a high-resolution MH Loop measurement over ± 7 T, with ≥ 500 data points acquired within 4 hours and rms noise should be less than 1×10^{-6} emu. Supporting data should be provided to establish the claim. Demonstration will be asked during evaluation.

D. ADDITIONAL MEASUREMENT MODES:

AC Susceptibility Measurement :

- System must support DC and AC Susceptibility measurement modes on a single hardware platform. Measurement mode should be automatically switched in software sequences.
- Vendor must provide a measurement data of DC and AC Susceptibility measurement on same sample measurement in one sequence. Supporting data files should be provided .
- AC Susceptibility measurement should support the temperature range from 2 K to 400 K. It is essential to provide a measured data from 2 K to 400 K along with data files performed on sample provided by the Institution. Demonstration will be asked during technical evaluation.
- AC frequency range should be 0.1 Hz to 1 kHz or higher.
- Peak AC Amplitude should be of ≤ 0.1 Oe to ≥ 10 Oe.
- AC Moment Sensitivity must be 5×10^{-8} emu or better over the entire field range. Demonstration will be asked during technical evaluation.
- Phase Angle Accuracy must be $\leq \pm 0.5^\circ$ over the entire AC measurement frequency spectrum. Vendor should provide the supporting data.
- Vendor should provide AC susceptibility data measured on their system for the frequency range 0.1 to 1 kHz with a suitable amplitude of the AC signal for sample provided by the Institution.

E. Other important points:

- The supporting data and log data files must be sent within the due tender application date to the given email id.

- Comprehensive compliance statement in line with each and every technical specification in the tender document should be provided. All the claims should be duly supported by the manufacturer’s literature or existing verifiable documents. Any other claim will not be accepted and may lead to rejection of the bid.
- Vendor will be asked to demonstrate all mentioned specification in similar Cryogen-free system installed in India within 2 weeks of such notice by the purchaser.
- Vendor should provide the details of the standard samples for testing the instruments at the time of installation at site for the demonstration of the performance of equipment.
- An extensive user list with the similar SQUID magnetometer systems to be provided. In addition, the vendor should also provide a list of systems for measuring physical properties other than SQUID magnetometer.
- Installation and adequate training should be carried out by the qualified service engineers at user’s site.

Warranty: Minimum 1 year, while 3 years extendable warranty is preferred. The warranty will be valid from the date of actual installation. Proper installation and training should be provided by the vendor. Onsite after sales service, within 48 hours of reporting any problem, is mandatory. It is preferable to have technical person stationed at Kolkata. A list of other places where the instrument has been installed should also be provided.

A compliance table (see below) must be prepared and submitted along with the technical bid.

Sr. No	Tender specification	Your offered instrument specification	Extent of compliance
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2. PRICE BID

The financial bid indicating (item-wise) price for the item(s) mentioned in the technical bid should be kept in a separate sealed envelope duly super scribed as ‘PRICE BID’ on the outer cover of the envelop as already detailed above. Price bids of only technically qualified bidders will be opened and they will be intimated the date and time of the opening of price bid at their e-mail ids. Rest of the bidders will stand rejected.

PRICE: Price to be quoted on CIF Kolkata and also FOB basis.

3. BID SECURITY DECLARATION:

a. An Account payee Demand Draft/Pay Order for Rs. 10,00,000 (Rupees Ten Lakhs only) drawn in favour of “Indian Association for the Cultivation of Science (State Bank of India, Jadavpur University Branch, A/C No. 11079699211, IFSC: SBIN000093, MICR Code: 700002048)” is to be furnished by the bidders except those who are registered with the Central Purchase Organizations, National Small Industries Corporation or the concerned Ministry or

Department, as Bid Security money or Earnest Money Deposit (EMD). Alternatively, bid security can also be provided in terms of Bank Guarantee.

b. The Demand Draft for the Bid-Security should have at least about 90 (ninety) days validity period of opening of the bids.

c. In case of non-award of the work the Bid Security money would be returned to the unsuccessful Bidders.

4. PERFORMANCE SECURITY:

An Account Payee Demand Draft or Bank Guarantee (BG) on any nationalized bank of India of 3% of the order value in the name of “Indian Association for the Cultivation of Science” is to be furnished by the successful bidder as Performance security. Performance security money should remain valid for a period of 60 days beyond the date of completion of all contractual obligations of the supplier including warranty obligations. Bid security money or EMD will be refunded to successful bidder on receipt of the Performance security money.

5. TERMS OF PAYMENT:

Payment will be made through irrevocable Letter of Credit in two installments. 90% of the money will be released on submission of shipping of documents. Remaining 10% will be released after successful installation of the instrument.

6. GENERAL INSTRUCTIONS

1. Validity of tender: Tender submitted should remain valid for at least six months from the date of opening the tender. Validity beyond six months from the date of opening of the tender shall be lapsed by mutual consent.

2. The tender should accompany a compliance chart.

3. Incomplete and conditional tenders as well as tenders received after the due date will be summarily rejected without assigning any reasons thereof.

4. At any time prior to the bid due date, IACS may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder during pre-bid meeting, modify the bidding documents. The amendment(s) will be notified on the institute website. Prospective bidders are advised to occasionally to visit the website (www.iacs.res.in/tender) for any amendment.

5. Installation/Demonstration/Application training at site: Installation & user training at IACS, free of cost by the supplier.

6. Service facility: In India, preferably Kolkata, supplier should mention their details of service setup and man powers who are responsible for after sales support. Response time should be within 24 hrs.

7. The model number, make and a printed literature of the product should be submitted positively.

8. Proposed delivery schedule should be mentioned clearly.
9. Manufacturers / exclusive distributors / vendors should have history of supplying this type of instruments to this or other scientific organizations. Availability of a list in this regard would be preferred.
10. Authorized dealership certificate should be provided in case of principal manufacturing company is not quoting directly.
11. Guarantee certificate, users' manuals etc. are to be handed over to the user after successful commissioning of the system.
12. In the event of date being declared a closed holiday for purchaser's office, the due date for submission of bids and opening of the technical bids will be the following working day at the appointed time.
13. In case of any dispute, the decision of IACS authority shall be final and bidding on the bidders.
14. For any clarification regarding technical specifications, information etc., please send your queries to Sugata Ray (mssr@iacs.res.in).
15. The authority of IACS reserves the right to reject any or all of the tenders received without assigning any reason thereof.

Registrar