

MALAVIYA NATIONAL INSTITUTE OF TECHNOLOGY JAIPUR

No. F5 (372) ST/MNIT/CEE/2016

Phone : 0141-2713312,2713352

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M/s

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NOTICE INVITING QUOTATIONS

IMPORTANT INSTRUCTIONS TO BIDDERS

Registrar, MNIT, Jaipur invites sealed "QUOTATIONS" for the supply of **Equipments** for **Centre for Energy and Environment** of this Institute in **two bid system (Technical & Financial bids separate envelop)**, as per schedule given below:

Event	Date & Time
Date of publication	11.02.2017
Download of Tender	11.02.2017
Bid submission Last Date	03.03.2017 by 2.00 PM
Technical bid opening	03.03.2017 at 3.00 PM
Financial bid opening	Will be intimated later on
Tender document fee	Rs.500/-
Earnest Money	As per annexure -1 st

1. Quotation must be enclosed in a properly sealed envelope addressed to the MNIT, Jaipur with kind attention to Assistant Registrar (S&P), MNIT, Jaipur by designation and not by name. The quotations must be superscribed "Quotations for the supply of **EQUIPMENTS** ----- as called for in Tender Notice No. ----- dated _____" DUE ON ----- AT -----AM/PM. The Quotation must reach on or before -----AM/ PM on or before the due date and time mentioned in the tender notice/tender document.
2. **THE DOCUMENTS MUST BE DROPPED IN THE TENDER BOX AVAILABLE IN CENTRAL STORE DURING OFFICE HOURS (09:30AM to 06.00PM) ON ALL WORKING DAYS. BIDS DELIVERED TO ANY OTHER PLACE OR ANY INDIVIDUAL SHALL NOT BE CONSIDERED AS VALID DOCUMENT. QUOTATIONS SENT BY E-MAIL WILL NOT BE CONSIDERED VALID.**
3. In the event of quotations being submitted by a firm, it must be signed separately by each member thereof, or in the event of the absence of any partner, it must be signed on his behalf by a person holding a power of attorney authorizing him to do so, or in the case of a Company, the quotations should be executed in the manner laid down in the said Company's Articles of Association. The signatures on the quotations shall be deemed to be authorized signatures.
4. All the columns of the quotation form shall be duly, properly and exhaustively filled in. **THE RATES QUOTED SHOULD REFLECT F.O.R. JAIPUR inclusive of all charges related to transportation from your end to MNIT, Jaipur in local currency, if possible. For imported items cost till CIF Delhi is to be shown separately.** The rates and units shall not be overwritten. Quotations shall

- always be both in the figures and words. The words “No quotations” should be written across any or all of the items in the schedule for which a tender does not wish to tender.
5. **Cost of each item should be quoted separately giving the unalterable delivery period. Rates of imported goods must be quoted excluding custom duty & excise duty as this institution is exempted from payment of custom & excise duty.**
 6. For importable items the bidder shall indicate on the Price schedule. the unit price and total bid prices of the goods it proposes to supply under the contract. The bidder must quote the FOB prices (ex-factory cost at the country of manufacturing origin) and also the bidder must quote the prices for CIF Delhi. Safe transportation after customs clearance at Delhi to MNITJaipur including unloading the consignment at the earmarked site is the sole responsibility of the supplier. The cost of the above work will be borne by MNITJ and the supplier must quote prices for the same in Indian currency.
 7. The quoted F.O.B. prices must be in currency of the country of manufacturing of quoted items. The cost of shipment, freight and other related taxes must be on the basis of port of shipment which has to be that of the country of origin of goods. However quotations/Performa invoice in US Dollar for items of foreign manufacturing origin shall be accepted. Prices for imported items, if quoted in currency other than that of the country of manufacturing origin, or in exceptional cases US dollars shall not be acceptable and the corresponding bid will be rejected.
 8. If a private limited company in India or a similar such company elsewhere abroad, in the same name and style as that of the original manufacturer, wishes to act as a direct bidder,(as if the manufacturer is submitting the bid), it must submit the copies of original documents revealing the techno-commercial, financial and legal relationship it bears with the manufacturer; this needs to be accompanied by a declaration from the overseas manufacturer that as its policy it does not receive direct orders from Indian academic institutions/ research organizations. Failure to do so will disqualify the bidder.
 9. The purchaser will evaluate and compare the technical bids which have been determined to be substantially responsive. The leaflets catalogue, etc. should be sent invariably so that a proper evaluation of the equipments offered is possible. Under no circumstances a bid shall be considered substantially responsive if it is not accompanied by the above documents.
 10. **Clarification of Bids.** During evaluation and comparison of bids, the purchaser may, at his discretion ask the bidder for clarification on its bid. The request for clarification shall be in writing and no change in prices or substance of the bid shall be sought, offered or permitted. No post bid clarification at the initiative of the bidder shall be entertained as all such clarifications would have been obtained prior to the submission of the bid.
 11. The bidder should clearly confirm that all the facilities exist in its factory or store for inspection and testing and these will be made available to the purchaser or its representative for inspection.
 12. Any omission in filling the columns of “units” and “rate” shall altogether debar a quotation for being considered.
 13. All corrections must be signed by the tenderers.
 14. **EMD:** A Demand Draft for according as per **annexure – 1st** specified in the name of the Registrar, M.N.I.T., Jaipur may please be sent along with your tender as Earnest Money without which no tender shall be considered. Cheques are not accepted as Earnest Money. No interest is paid by MNIT on the amount of earnest money. For multiple items in single NIQ, if the firm doesn't submit DD equivalent to EMD for all item quoted, all the bids submitted by him shall stand cancelled. EMD and Tender fee must be enclosed in the Technical bid.
 15. **MNIT does not bind himself to accept the lowest tender and reserve to himself the right to reject any or all tenders without assigning any reasons.**
 16. No tender will be considered unless and until all the documents are properly signed.
 17. The quotations will be regarded as constituting an offer or offers open to acceptance in whole or in part or parts at the discretion of MNIT, Jaipur.

18. The bidder is expected to examine all instructions, forms, and specifications in the bidding documents. Failure to furnish all information required by the bidding documents or submission of a bid not substantially responsive to the bidding documents in every respect will be at the Bidder's risk and may result in rejection of its bid.
19. The intending bidder must read the terms and conditions of Bid document carefully. He should only submit his bid if he considers himself eligible and he is in possession of all the documents required. The bid document consisting of the set of terms and conditions and other necessary documents required can be seen and downloaded from website www.mnit.ac.in.
20. All bids must be accompanied by a bid security as specified in the bid document and must be delivered to the above office at the date and time indicated above.
21. It is stipulated that insurance will have to be provided through any of the Insurance agencies. /Companies approved under Government of India Regulations.
22. The prospective bidders can be those who are the manufacturers of the equipment. For items manufactured outside India, the manufacturer itself can be a bidder or its authorised Indian agent can bid on behalf of its Principal that is the manufacturer.
23. In the event, the country of origin of goods is India, only the manufacturers shall be considered eligible for bidding. Authorised agents of Indian manufacturers may be permitted to submit the bid, provided the concerned manufacturer states that as its policy, it does not bid itself in India and that there is no qualitative difference between manufacturer and its agent as bidder in respect of quality of supplies, cost, and responsibility of maintenance and servicing. The Indian manufacturer must describe the alternatives in clear terms, in the event the bidding agent ceases to continue as agent of the concerned manufacturer within the stipulated warranty period.
24. For all items manufactured in India, only price for 'F.O.R' MNIT Jaipur need be quoted.
25. If any Indian manufacturer requires importing an essential part from a foreign country, the said company may be given to enjoy the benefit of customs duty exemption with the aid of CDEC of MNIT, Jaipur provided the import of the concerned item is done on behalf of MNIT, Jaipur.
26. In case a foreign manufacturer by itself wishes to directly quote for an item in Indian currency, taking into consideration of customs duty exemption, proviso, the same shall be allowed by MNIT, Jaipur.
27. **If a private limited company in India or a similar such company elsewhere abroad, in the same name and style as that of the original manufacturer, wishes to act as a direct bidder,(as if the manufacturer is submitting the bid), it must submit the copies of original documents revealing the techno commercial, financial and legal relationship it bears with the manufacturer; this needs to be accompanied by a declaration from the overseas manufacturer that as its policy it does not receive direct orders from Indian academic institutions/ research organisations. Failure to do so will disqualify the bidder.**
28. The Indian/Foreign agencies participating in the tender must have annual turnover not less than the 15 times of the cost of the equipment they are quoting; appropriate document in this regard must be provided, failing which the bid will stand cancelled.
29. At any time prior to the deadline for submission of bids, the purchaser may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder, modify the bidding documents by amendment.
30. All prospective bidders who have received the bidding documents will be notified the amendment in writing or by email or by fax, and will be binding on them.
31. In order to allow prospective bidders reasonable time in which the amendment is taken into account in preparing their bids, the purchaser, at its discretion, may extend the deadline for the submission of bid.

THERE IS TWO BID SYSTEM:-

(TECHNICAL AND FINANCIAL BID, both bids should be submitted in separate envelopes):

- A) In pre-qualification cum-technical bid. Bidder shall enclose the following document:

- a) Bidder shall enclose Earnest Money Deposit (EMD).
- b) Bidder must be in the business of similar equipment/items supplying business from last 3 years (enclose Proof).
- c) Bidder must be a manufacturer/authorized distributor/ Dealers must enclose a certificate of authorization of manufacturer with the bid.
- d) All Indian agents of foreign company must provide valid proof that they are the agent in India on behalf of the manufacturer; any proof without due certification from the manufacturer under its own letter head shall be void *ab initio*.
- e) Manufacturer should have ISO 9001 or any other certification submit document as proof.
- f) Bidder should have after sales service set up preferably at Jaipur, in the State of Rajasthan and Delhi and should be in a position to provide satisfactory after sales service support from the nearest place of installation. The bidders have to submit OEM support certificate with technical bid. List of OEM support centers in India along with address should also be submitted
- g) The manufacturers should supply documentary proof i.e. Registration with the Registrar of Industries, National Small Scale Industries Corporation or with penal of MNIT in case of manufacturer. Offers other than the manufacturers should be supported with an authority letter from the manufacturers, authorizing them to quote rates standing guarantee for the satisfactory execution of supply orders failing which offers are liable to be ignored.

The bidder must furnish the following (Failing which the offers/tenders are liable to be ignored)

- a. A list of reputed national institutes (e.g. IITs, NITs, Centrally funded institutes)/research organizations (viz. DMRL, BARC, IGCAR, NPL and Other CSIR and DRDO laboratories) where the similar equipment has been supplied within 3 years and is in operation.
 - b. The evidence of adequacy in capability of providing the service support during and after the warranty period. This document must be authenticated by the Manufacturer, in case the authorized agent is the bidder.
 - c. One declaration by the Manufacturer to the extent that in case of failure of its local agent /office to provide service support to the satisfaction of MNIT Jaipur, it shall make immediate arrangement for required service support.
 - d. **Bidder should enclose technical compliance from the Manufacturer. The specifications of items should be strictly as specified. Deviation, if any may please be mentioned separately. If there is no deviation than it should be mentioned as “No Deviation”.**
 - e. The leaflets catalogue, related to quoted equipment/model etc. should be sent invariably, so that a proper evaluation of the equipment offered is possible.
 - f. Mention must be made of the pre-installation requirements for the equipment quoted viz. ambient temperature, humidity, weather specifications, power specifications, civil works etc. When items are provided full performance satisfaction should be demonstrated.
 - g. Bidder must enclose the acceptance of terms and conditions and must enclose the duly signed and stamped tender document.
 - h. All the Annexure enclosed should be duly filled up and signed.
 - i. Please attach proof/certificate of each condition required in the tender document.
32. The purchaser will evaluate and compare the bids which have been determined to be substantially responsive.
33. Notwithstanding anything specified in the tender document, the Purchaser, MNIT Jaipur at its sole discretion, unconditionally and without assigning any reasons to the bidders, reserve the rights:
1. To accept or reject lowest tender or any other tender or all the tenders.
 2. To accept any tender in full or in part.

3. To reject the tender offer not confirming to the tender terms or faulting to replying to any certification sought during the period of evaluation of bids.
 4. To rank substantially responsive bids in accordance with the technical merits of the quoted item.
34. Losses or damages in transit will be taken into the account of the supplier in case of rates **F.O.R. JAIPUR**. The supplier may, if he so desires, get the goods insured and include such charges in the tendered rate.
35. **Payment Terms: -**
1. Payment will be made through e-transaction (electronically) (RTGS), to facilitate electronic payment the supplier must give following information: (a) Title of the Account, (b) Bank name and Branch (c) Account number and (d) IFSC code. The supplier must also attach one cancelled cheque along with the Invoice of the firm to facilitate the e-transfer (RTGS) of payment.
 2. Payment will be made through LC to foreign suppliers as per Gov. of India rules against the Performa Invoice. (to be accompanied by 10% performance bank guarantee without fail), which must be compliant with the list of items attached herewith
 3. The payment will be made under following two stages:
 - a. Payment on shipment and furnishing of Performance Security: 90 % of the Purchase Order Value.
 - b. On satisfactory Installation and commissioning: 10 % of the Purchase Order Value.
 4. The defective, substandard and contrary to the specification of instrument supplied have to be replaced by the supplier at their cost and responsibility.
36. All payments shall be made against the Performa invoice raised directly by the manufacturer and in accordance with terms and conditions of the purchase order.
37. **Delivery Period:-** The ordered quantity of stores must be delivered within 6 to 8 weeks in the case of indigenous equipment and 14 to 16 weeks in the case of imported equipment, F.O.R. Destination MNIT, Jaipur at Supplier's Risk within the period specified and got inspected as the delivery of store is required urgently and as such the renderers should quote their earliest delivery period accordingly.
38. **Performance Bank guarantee**
Successful Bidder has to Provide Performance security @ 10% of the equipment cost, valid for entire warranty period given in their offer which should be for minimum (01) two year period in the form of Bank's Guarantee from a nationalized bank. Warranty will cover repair/replacement of all defective parts, if any, with the same or equivalent make for any part removed. Maintenance will be provided at site. Limited/carry in warranty will not be accepted. The supplier will provide after sale service during the warranty period from nearest place to installation. The supplier will attend the complaint within 24 working hours and not beyond 5 working days.
39. **Responsibilities: -** It shall be the responsibility of the vendor to keep the supplied item in good working condition so as to ensure a minimum of 95% uptime by carrying out the necessary repairs/maintenance of item supplied, otherwise it shall be treated as a non performance on the part of the vendor for which performance guarantee may be forfeited and firm may be black listed for future business. The vendor shall provide free replacement of equivalent part as and when required, excluding consumable part. Warranty period shall be applicable from the date of successful installation.
40. **Installation: -** Successful BIDDER shall depute concerned specialist, for supervision of erection & commissioning of the machine to be carried out as and when necessary. The successful BIDDER shall make necessary arrangements at their own expenses for stay, transport and other expenses of their specialist during their stay in Jaipur;
- A. The vendor shall give the wiring diagrams and the panels required for the system installation in advance. User Department/Organization shall make available the necessary wiring panels at installation site.

- B. Full details of the space requirement with dimensions should be given in advance. Successful BIDDER shall depute concerned specialist, for supervision of erection & commissioning of the machine to be carried out as and when necessary. The successful BIDDER shall make necessary arrangements at their own expenses for stay, transport and other expenses of their specialist during their stay in Jaipur which also includes imparting training to MNIT Jaipur personnel.
41. **Training:-**The bidder shall submit the maintenance and training proposal for three officials of MNIT at least for one week at on the offered instruments.
42. **AMC:-**Annual maintenance contract rate should be quoted separately and should remain valid for 5 years after expiry of warranty period.
43. Notwithstanding anything stated above, the purchaser reserves the right to asses that the bidder has the financial, technical and production capability necessary to perform the contract should circumstances warrant such assessment.
44. The quoted rates should be valid at least for **120 days (four months)** from the last date of receipt of quotations.
45. All legal proceedings, if necessity arises to institute may be any of the parties (Institute or Contractor/Supplier) shall have to be lodged in the courts situated at Jaipur and not elsewhere.
46. (a) **The Penalty Clause is as under:-**
If the tender fails to deliver the goods within the period specified in the tender form the Institute may, at its discretion, allow an extension in time subject to recovery from the tender as agreed liquidated damages, and not by way of penalty, a sum equal to the percentage of the value of stores which the tender has failed to supply for period of delay as stated below: -

(i)	Delay up to one month	1%
(ii)	Delay exceeding one month but not exceeding two month	2%
(iii)	Delay exceeding two month but not exceeding three month	5%
(iv)	Delay exceeding three month	5% for each month and part there of subject to maximum 10%

- (b) In case of failure to supply the goods within the prescribed time and in accordance with the specifications given in the Quotations, the institute shall be free to cancel the order and make purchases from the next higher tenderer or from the open market as the case may be. In that case the losses sustained by the institute shall be recovered from the defaulting supplier. The institute will be at liberty to recover the losses from the earnest money/or any other pending claims of the supplier without prejudice to its general right to effect recovery from the supplier.
47. Equipment list with specifications is enclosed as Annexure-III.
48. **Arbitration Clause: -** In the eventuality of any dispute, the sole Arbitrator shall be Registrar, MNIT, Jaipur and his decision shall be binding on all the parties.

AR (S& P)

Sr. No.	Name of Items	Earnest Money Amount
01	Electrochemical Workstations (Bi-Potentiostat / Galvanostat)	35000/-
02	HOT Air Oven Convective	6000/-
03	Fume Hood	6000/-

Kindly attached the RTGS details with cancelled cheque along with the Earnest Money.

AFTER SALE SERVICE CERTIFICATE

From:

To

The Registrar,
Malaviya National Institute of Technology (MNIT),
Jaipur

Whereas, we M/s (Bidder Name) are established & reputable manufacturers (Make of items) of [items name] having service offices at Delhi, Jaipur and in the state of Rajasthan. Details are as under:

Sr.No. Address of Service Centre Phone No. Number of Engineers

- 1.
- 2.
- 3.

We do hereby confirm that:

Services including repair/replacement of defective parts will be done by us. Replacement of defective Systems/parts will be done by equivalent or better systems/parts of the same make. We will attend all the complaints/service calls within 24 working hours and not beyond 5 working days. Down time will not exceed beyond 5 working days. In case, down time exceed 5 working days then we will extend the warranty period of that item(s) double of the down time.

(Signature)

Name :

Designation :

(Head or Senior Executive of Firm)

Address :

Phone No :

Fax No:

Mobile No :

Item Name: ELECTROCHEMICAL WORKSTATION (Bi-Potentiostat/Galvanostat)**TECHNICAL SPECIFICATION:**

This electrochemical workstation will be couple with rotating ring disk electrode and other accessories to perform the hydrodynamic studies on the catalysts. The equipment should be capable of:

- Performing voltammetric and potentiometric measurements.
- Will be having Frequency Response Analyzer and bipot module.
- Will be coupled with rotating ring disc electrode for reaction kinetic studies
- Performing fuel cell and electrolyzer measurements.
- 3- or 4-electrode configuration
- Floating (isolated from earth) or earth ground
- Potential scan range: ± 10 V
- Applied potential resolution: 0.02% of potential range
- Measured current range: \pm Na to < -200 mA peak current > 300 mA
- Compliance Voltage ± 10 V
- Compliance Current ± 200 mA

Electrochemical Workstation with Bi-Potentiostat/Galvanostat with Voltammetry, pulse techniques, fixed potential electrolysis, charge/discharge, Corrosion, Impedance, Electrochemistry s/w, Latest Windows Based Acquisition s/w complete with power supply 220V/50Hz, computer interface . Electrochemical Cell System should include 4 glass cells with one Cell top with following electrode(s):

- Gold working electrode (02nos.)
- Glassy Carbon electrode (01nos)
- Pt. working electrodes (01no.)
- Ag working electrode (3/pkg) (aq)
- Ag/AgCl reference (3/ pkg) (aq)
- Ag/AgCl reference (3/ pkg) (non aq)
- Calomel Electrode (SCE) 01nos.
- Pt wire counter electrode(1Nos)
- Electrode polishing kit (1no.)

- Multiplexer- 8Channel

Capable of following General Technique(s)

- Cyclic Voltammetry (CV) with simulation/fitting programs
- Linear Sweep Voltammetry (LSV) with stripping
- Bulk Electrolysis with Coulometry (BE)

Trace Metal analysis & Pulse Techniques

- Differential Pulse Voltammetry (DPV) with stripping
- Normal Pulse Voltammetry (NPV) with stripping
- Square Wave-Osteryoung Voltammetry (SWV) with stripping

Corrosion

- Tafel Plot (TAFEL), potentiodynamic deactivation, pitting corrosion, corrosion rate, linear Polarisation, Corrosion current etc.

Fuel cell

- Multi-Potential Steps (STEP)
- Multi-Current Steps (ISTEP)
- Amperometric i-t Curve (i-t) – Lifetime testing
- Polarisation I-V curves Linear Sweep
- Open Circuit Potential – Time (OCPT)

Impedance

- AC Impedance (IMP)
- Impedance – Time (IMPT) (Mott-Scottsky)
- Impedance – Potential (IMPE)
- Impedance Simulator with fitting
- Open Circuit Potential – Time (OCPT)

AC Impedance Plots with Simulation with specific measurements:

- Bode : $\log Z$ vs $\log(\text{freq})$
- Bode : Phase, vs $\log(\text{freq})$
- Bode : $\log Z''$ & Z' vs $\log(\text{freq})$
- Bode : $\log Y$ vs $\log(\text{freq})$
- Nyquist ; Z'' vs Z'
- Admittance; Y'' vs Y'
- Warburg: Z'' & Z' vs $\omega^{1/2}$ ω -angular frequency
- Z' vs $\omega Z''$
- Z' vs Z''/ω
- Cot (phase) vs $\omega^{1/2}$

Battery Charge/Discharge

- Galvanostatic Charge discharge single/multiple cycle -Chrono Potentiometry (CP) with potential limits, polarity by potential or time, no. of cycles etc
- Voltage vs current density curves

Deposition Studies

- Single or Multi potential steps with charge limits, single or multistep, mixed voltage/current control using macro

Photovoltaic studies

- I-V measurements, I_{max} , P_{max} , Fill factor etc

Institute Spectroelectrochemical study

- Transmission mode for ITO plates or Pt grid, Reflection mode for Pt/GC electrodes & Dip probe for coulometrically generated species

RDE/RRDE

- Linear sweep for concentration ratio of metal ion different oxidation states, Hydrodynamic Modulation Voltammetry (HMV) change in voltage w.r.t. ramp of the motor, RDE control (0-10V output)

General Useful Techniques

- Chrono Amperometry (CA)
- Chrono Coulometry (CC)
- AC Voltammetry (ACV) with stripping
- Differential Normal pulse Voltammetry (DPNV) with stripping
- Second Harmonic AC Voltammetry (SHACV) with stripping
- Differential Pulse Amperometry (DPA)
- Double Differential Pulse Amperometry (DDPA)
- Triple Pulse Amperometry (TPA)
- Integrated Pulse Amperometry Detection (IAPD)
- Sweep-Step Functions (SSF)
- Chronopotentiometry with Current Ramp (CPCR)
- Potentiometric Stripping Analysis (PSA)
- Staricase Voltammetry (SCV) with stripping
- Auxiliary Signal Measurement Channel
- IR Compensation, External Potential Input

Galvanostat

1. Galvanostat applied current range: 50 nA onwards 200mA
2. Applied current resolution: 0.02% of applied current range
3. Reference electrode input impedance: 1×10^{12} ohm
4. Fast data acquisition: 16-bit ADC

Experimental Parameters

1. CV and LSV scan rate: $> 8,000$ V/s
2. DPV and NPV pulse width: 0.01 to few sec

3. IMP frequency: few uHz to 1 MHz

4. Double and triple pulse technique

5. Hydrodynamic Voltammetry

(All modes should be demonstrated)

Electrochemical Workstation with Frequency Response Analyzer module and Bi-potentiostat/Galvanostat module .

Specifications	
<i>Bi-Potentiostat/ Galvanostat</i>	<i>Experimental Parameters:</i>
• Zero resistance ammeter	• CV and LSV scan rate: 0.000001 to <8,000 V/s
• 2- or 3- or 4-electrode configuration	• Potential increment during scan: 0.1 mV @ 1,000 Volts/sec
• Floating (Isolated from Earth) or earth ground	• CA and CC pulse width: 0.0001 to 1000 sec
• Maximum potential: $\pm 10V$	• CA and CC minimum sample interval: 1 usec
• Maximum current: ± 200 mA continuous, ± 300 mA peak	• True integrator for CC
• Compliance Voltage: $\pm 10V$	• DPV and NPV pulse width: 0.001 to 10 sec
• Potentiostat rise time: < 1 us, 0.8 us	• SWV frequency: 1 to 100 kHz
• Potentiostat bandwidth (-3dB): 1M Hz	• i-t sample interval: minimum 1 usec
• Applied potential ranges: $\pm 10mV$, $\pm 50mV$, $\pm 100mV$, $\pm 650mV$, $\pm 3.276V$, $\pm 6.553V$, $\pm 10V$	• ACV frequency: 0.1 to 10 kHz
• Applied potential resolution: 0.0015 % of potential range	• SHACV frequency: 0.1 to 5 kHz
• Applied potential accuracy: ± 1 mV, $\pm 0.01\%$ of scale	• FTACV frequency: 0.1 to 50 Hz, simultaneous acquire 1st, 2nd, 3rd, 4th, 5th, and 6th harmonics ACV data
• Applied potential noise: <10uV rms	
• Measured current range: ± 10 pA to ± 0.25 A in 12 ranges	• IMP frequency: 0.00001 to 1M Hz
• Measured current resolution: 0.0015 % of current range, minimum 0.3 fA	• IMP amplitude: 0.00001V to 0.7V RMS

<ul style="list-style-type: none"> Current measurement accuracy: 0.2% if current range $\geq 1\text{e-}6\text{A/V}$, 1% otherwise 	<p>Others:</p> <ul style="list-style-type: none"> Automatic and manual iR compensation
<ul style="list-style-type: none"> Input bias current: < 20 pA 	<ul style="list-style-type: none"> Current measurement bias: full range with 16-bit resolution, 0.003% accuracy
Galvanostat:	
<ul style="list-style-type: none"> Galvanostat applied current range: 3nA – 250mA 	<ul style="list-style-type: none"> Potential measurement bias: $\pm 10\text{V}$ with 16-bit resolution, 0.003% accuracy
<ul style="list-style-type: none"> Applied current accuracy: 20pA $\pm 0.2\%$ if $> 3\text{e-}7\text{A}$, $\pm 1\%$ otherwise 	<ul style="list-style-type: none"> External potential input
<ul style="list-style-type: none"> Applied current resolution: 0.03% of applied current range 	<ul style="list-style-type: none"> Potential and current analog output
<ul style="list-style-type: none"> Measured potential range: $\pm 0.025\text{V}$, $\pm 0.1\text{V}$, $\pm 0.25\text{V}$, $\pm 1\text{V}$, $\pm 2.5\text{V}$, $\pm 10\text{V}$ 	<ul style="list-style-type: none"> Programmable potential filter cutoff: 1.5M Hz, 150K Hz, 15KHz, 1.5KHz, 150 Hz, 15 Hz, 1.5Hz, 0.15Hz
<ul style="list-style-type: none"> Measured potential resolution: 0.0015 % of measured range 	<ul style="list-style-type: none"> Programmable signal filter cutoff: 1.5M Hz, 150K Hz, 15KHz,
Electrometer:	
	1.5KHz, 150 Hz, 15 Hz, 1.5Hz, 0.15Hz
<ul style="list-style-type: none"> Reference electrode input impedance: $1\text{e}12$ ohm 	<ul style="list-style-type: none"> RDE control output (Model 630E and up) : 0-10V (corresponding to 0-10000rpm), 16-bit, 0.003% accuracy
<ul style="list-style-type: none"> Reference electrode input bandwidth: 10M Hz 	<ul style="list-style-type: none"> Digital input/output lines programmable through macro command
<ul style="list-style-type: none"> Reference electrode input bias current: ≤ 10 pA @25 deg C 	<ul style="list-style-type: none"> Flash memory for quick software update
Waveform Generation and Data Acquisition:	
<ul style="list-style-type: none"> Fast waveform updating rate: 16-bit @ 10 MHz 	<ul style="list-style-type: none"> Cell control: purge, stir, knock
<ul style="list-style-type: none"> Fast data acquisition: dual channel 16 bit ADC, 1,000,000 samples/sec simultaneously 	<ul style="list-style-type: none"> Digital CV simulator, user defined mechanisms
<ul style="list-style-type: none"> External signal recording channel at maximum 1M Hz sampling rate 	<ul style="list-style-type: none"> Impedance simulator and fitting program

ELECTROCHEMICAL SOFTWARE:

Software should have facility to record additional signal viz EQCM, bi-potentiostat etc. Import/export ASCII. Ready-to-use Vis & Generic interface for .Net applications should be included. It should have facility to display up to 4 plots simultaneously. Comparison with previous experiments should be possible while experiments are in progress. The software should support following basic electrochemical measurements: Cyclic Voltammetry with scan rates from 10 $\mu\text{V}/\text{Sec}$ to 200V/Sec, Sampled DC Voltammetry. Tafel Plots, Differential

Pulse Voltammetry, Square Wave Voltammetry. Electrochemical methods like Chrono Amperometry, Chrono-Coulometry & Chrono-Potentiometry.

ESSENTIAL ACCESSORIES:

1. Branded compatible PC (64 BIT Processor, 1-4 TB HDD, 500GB SSD, 16GB RAM), Printer-cum-Scanner, 2 KVA UPS with one hour back up.
2. Current Booster 2A module Current booster to enhance the maximum current of the system. Operation Mode: Potentiostatic and Galvanostatic.
3. Electrochemistry Cell :It should consist of the following:
50 mL Glass cell 1no, 50 mL glass thermostat table glass vessel 1 no. 3mm diameter GC&Pt ,Au disc working electrode 1 (one) no. (it should be possible to use these tips as RDE tips as well), Pt wire Counter electrode 1 mm dia 5 mm length 1 no, Ag/AgCl reference electrode (Aqueous) & Ag/AgCl reference electrode (Non-Aqueous) 1 no each. Suitable Lid for the cell and purge tube with valve.

Others

- i. Vendor should provide the standard samples for testing the instruments at the time of installation at site for the demonstration of the performance of equipment.
- ii. Manual – technical aspects with service details (electronic and hard copy)
- iii. Details of the standard samples to be provided by the company for testing the instruments at the time of installation at site for the demonstration of the performance of equipment
- iv. Installation – The satisfactory installation to the full specifications of the machine with all accessories at MNIT JAIPUR campus. Any additional equipment/accessory for the installation of the system should be quoted invariably MNIT JAIPUR will provide only space and electrical connection.

- v. The vendor should specify the power requirements for all the components in the technical quotation.

Note:

- A. Operation and service manual in English (electronic and hard copy) should be provided with all the equipments.
- B. In the technical details, specify clearly about the kind of service/maintenance required for the system. Also mention that whether the service has to be carried out by a company engineer or it can be carried by trained service personnel within India.
- C. The complete training of all measurement options should be Free for staff/students members, onsite.
- D. Enclose pre-installation guide for the details on electrical power, space and other for all components and essential accessories.
- E. Bid should include all other essential auxiliary equipment and spares for its operation (please provide list with the details).
- F. All sample handling tool-kits/consumables also should be provided. Wherever, consumables and other items required to handle the system while operating all measurement options, must be quoted separately for enough quantity.
- G. Quote separately for all optional items/accessories, optical components and consumables which are not explicitly specified above however required for smooth functioning of the machine/system.

ITEM NAME: FUME HOOD SINGLE WALLED

TECHNICAL SPECIFICATIONS

LABORATORY FUME HOOD (5 feet, ONE)

- **Airflow Type:** For Air Conditioned laboratories.
- **Overall dimensions:** min 5 feet bench top fume hood (approx.5 X 2.5 X 3 Feet)

Laboratory Fume Hood should incorporate a sleek glacier white powder-coated steel exterior with a molded one-piece fiberglass liner of specially-formulated fiberglassreinforced polyester, which will offer corrosion and fire resistance and easy clean up and pre-set baffle(s) with flame spread less than 25 per ASTM E-84.

1. The fume hood should have Clean-Sweep Sash Handle. The sash handle should include Clean-Sweep slots to bleed air into the hood chamber and direct chemical fume concentrations away from the user's breathing zone. The slim-line radiused sash handle sweeps airflow into the hood with minimal turbulence.
2. The fume hood should have Opti-Zone or better Baffle system (the technology should be described). The Opti-Zone Baffle is required for decreasing the typical face velocity variations found with other baffles. The slot pattern should increase the velocities in the middle and at the work surface of the hood where it is needed while slowing velocities at the corners. This uniformity lowers the required average face velocity necessary for containment. Tapered slots decrease resistance to air entering the baffle.
3. The fume hood should have Eco-Foil or better Air Foil (the technology should be described) - The Eco-Foil is required to reduce energy consumption by 7-10% compared to flat air foils while its aerodynamic curve allows air to sweep the work surface for maximum containment. Clean-Sweep openings should pull inflow air from under the air foil forcing air into non-turbulent air streams. The curve should be comfortable for arms resting on it while encouraging users to keep fume-generating items well within the hood's interior. Cord-Keeper Slots on left and right side of air foil.
4. **Upper Dilution Air Supply** - The sash interior should be constantly bathed with room air from the dilution supply above the work area to eliminate chemical fumes along the sash plane, near the critical breathing zone. A small Percentage (5-10%) of the required air volume should be introduced through the dilution air supply to ensure maximum containment.

5. Ergonomic air foil, which will allow air to sweep the work surface for maximum containment. Clean-Sweep airflow openings pull inflow air from under the air foil so that clean air continually flows over the air foil creating a constant barrier of protection from contaminants.
6. Approx. 3/16" thick tempered safety glass vertical-rising sash(es) with cable pulley and with epoxy coated sash handle. Sash should not extend above the hood when fully open.
7. Removable front and side panels and front access panels for access to plumbing and electrical wiring. About 37.5" (95.3 cm) high sightline from the work surface to header panel.
8. One-piece molded fiberglass liner for superior corrosion and chemical resistance, durability and light reflectivity. It will help in seamless and smooth, radiused corners for easy cleaning and less deterioration resulting longer life. The hood should have molded fiberglass approx. 12.8" ID exhaust connection(s).
9. **Lighting:** The hood should have explosion proof anti-glare cool white light system. Prewired T8 fluorescent lighting with vapor-proof design and ADA-compliant light and blower switches.
10. **With built-in blower:** Quiet built-in blower is required which should be belt-driven with molded thermoplastic housing and coated aluminum impeller that is non-sparking and corrosion-resistant. It should be available with explosion-proof or standard motor. Silent high efficiency remote blower is required. The construction should be chemical and heat resistant.
11. **Ducting:** Required [approximately 15 feet length], the fume extraction system should comprise a blower with dynamically balanced impeller fitted at the top of the fume chamber, PVC make ducting. Manual duct damper should be included.
12. **Valve tubing and service line:** Provisions for utility services like nitrogen, vacuum (brass lacquer coated fixtures and SS304 or similar piping), compressed air, and water (brass lacquer coated fixtures and SS304 or similar water piping) should be provided through remote controlled valves located within the end panels, controlled by extension rods projecting through the control panels of the hood, with color coded plastic handles.
13. All plumbing fittings should be factory installed and piped between the valve and the outlet. Inlet piping should have a single-point connection for each valve provided and carried to a point 1" above the fume hood roof or 1" above the worktop rear corner depending on the rough-in locations.
14. **Storage cabinet:**
 - (a) **Acid storage cabinet:**

Where indicated acid storage cabinets should use the same gauges of steel and construction features as other base cabinets. The cabinet width should be approximately 36" (91 cm) with manually closing dual doors and filler panel depth of 8.0". In addition, they should have a one-piece liner insert made of linear lowdensity polyethylene. The liner insert should form a one-inch pan at the bottom to retain spillage. The door should have durable epoxy-coated steel construction with corrosion-resistant polyethylene-lined interior. It should have attractive glacier white exterior which complements laboratory casework. It should be able to support loads up to 800 pounds. Each cabinet should be vented into the fume hood with a 1- 1/2" vent pipe to provide a positive airflow directly into the fume hood exhaust system. Vent Kit and Shelf Kit with PVC Tray should be included.

(b) Solvent Storage Cabinets

Solvent storage cabinets should be specifically designed for the storage of flammable and combustible liquids. The cabinet width should be approximately 36" (91 cm) with manually closing dual doors and filler panel depth of 8.0". The door should have durable epoxy-coated steel construction with 1.5" air gap. It should have attractive glacier white exterior which complements laboratory casework. It should be able to support loads up to 800 pounds. It should include epoxy coated steel shelf. The cabinet should include two rear vent connections with flame arrestors and closure plugs. It should include four leveling feet and one 8" filler panel to increase cabinet depth from 22" to 30".

15. Should have spill stopper work surface molded from a special formulation of corrosion resistant epoxy resins with sink & faucet at the right side of the hood.
16. Should have Vacuum, Nitrogen, Argon service fixtures .
17. Should be supplied with built-in Blower Remote Blower Features • Should be ideal for fume hood exhaust systems in moderate to highly corrosive conditions • CFM: Between 1000 and 2000, Less than 1000 • Thermal override protection. RPM speeds should be automatically reduced when motor is overloaded. • Should have flow-through vent holes and louvers allow air to circulate. • Speed control box should be included for mounting on top of customer-supplied fume hood and blower switch and label for multiple speed operation. • When blower is properly installed to ductwork, sound levels should range from 50 to 70 dba. • Should have direct drive, UL listed ECM motor which uses one third less energy than belt drive motors.
18. Should be responsible for installation of the Hood.
19. Should have minimum 4 power points on the panel of the hood (two 15 amps and 2 5 Amps). Should have pre-wired GFCI electrical duplex receptacle on lower right side and one additional prewired GFCI electrical duplex receptacle on the lower left side.
20. **Electrical:** 208-230 volts, 50/60 Hz.

21. The following accessory should be included • Airflow Monitor, 208-230V, 50/60 Hz • 230V, 50 Hz Receptacle Kit • Fiberglass Blower, 12", 3/4 hp
22. Lattice Rod Assemblies: 1/2" diameter solid epoxy rods should be clamped with the epoxy clamps to form a lattice arrangement to hold the test samples and rotors within the fume hood.

Item Name : HOT AIR OVEN (CONVECTION)

TECHNICAL SPECIFICATIONS

- **Construction** :-Triple wall construction, Inside Stainless Steel 304 Mirror finish, Outer CRCA sheet with powder coating .
- **Insulation** :- Max.3" High grade heavy glass wool.
- **Air Circulation** :- Motorized blower with insulated shaft on backside of the chamber, to ensure max. uniform temperature distribution inside the chamber.
- **Blower motor** :- 1/2 HP, TEFC, F- Class insulation, Single phase, 1440 rpm, 230 V.
Only Branded & Reputed make.
- **Heating System** :-Preheating Chamber Technology for homogeneous temperature control throughout the chamber. Shouldhave adjustable exhaust air flap.
- **Safety PID Controller** : Safety PID controller to cut off heater supply in case of temperature setting with an accuracy of 1°C overshoot with alarm system.
- **Door**: Single door to be fitted on heavy cast and chromium plated hinges with spring and roller type latch with ceramic gasket.
- **Trays** :Two chrome plated trays /Stainless steel rod trays .
- **Quantity of Tray**:-2 nos.(Removable)
- **Supply** : 230 V AC, 1- ϕ , 50 Hz. ,
- **Temp. Range** :5°C above ambient To 300 °C.
- **Operating Temp.** :-250 °C.
- **Temperature Accuracy** :- At-least $\pm 0.5^{\circ}\text{C}$
- **Temperature Uniformity** :- $\pm 1^{\circ}\text{C}$ with stability $\pm 2^{\circ}\text{C}$
- **Control System** :-Microprocessor based auto tuned PID controller with CE mark and dual display & process value for precise control of temperature. ,
- **Capacity**:-Approx. 175 Lt
- **Internal size (mm)**:- Approx. 700 x 720 x 600
- **Safety Device**:-Safety Digital temperature controller with accessories and Digital timer.
- **Amperage** :Max. 14 A

ASSISTANT REGISTRAR (S & P)