

**Indian Institute of Technology
Department of Chemical Engineering**

September 8, 2011

Purchase of Potentiostat/Galvanostat with FRA & accessories

Quotations are invited for one Potentiostat/Galvanostat with minimum specifications given in the Table below. Technical and commercial bids must be submitted in **separate** sealed envelopes subscribed with “Technical Bid” or Commercial Bid” as appropriate. Both technical and commercial bids should be enclosed in an envelope subscribed “Quotation for Potentiostat/galvanostat”.

The quotation should reach **Prof. A. N. Bhaskarwar, Head of Chemical Engineering department, Department of Chemical Engineering, IIT Delhi, Hauz Khas, New Delhi – 110016** latest by **5:00 P.M. on September 28, 2011.**

S. No.	Item	Description
1	Compliance voltage	± 30 V at full rated current or more
2	Applied Voltage	± 10 V
3	Current	± 2 A or more
4	Minimum potential increment during scan	0.1 mV
5	Measured potential resolution	30 μ V
6	Scan rate	1- 200mV/sec or more
7	Measured current resolution at 10nA range	30 fA
8	Potentiostat rise/fall time (1 V step, 10-90%)	250 ns or below
9	Potentiostat bandwidth (at 1 kOhm, 1mA)	1MHz
10	Current Ranges	1 nA to 1A in several ranges
11	Current Resolution	1pA
12	System Rise Time	Less than 3 μ s
13	Noise & Ripple	Less than 25 μ V rms referred to external signal
14	Measured current Band-width	1 MHz (in higher current range) or more
15	Electrometer specifications a. Bandwidth b. Input Impedance c. Input Current d. CMRR	4MHz or more 1T Ω // 8 pF or more 10 pA or less > 60dB at 3 Hz
16	Frequency response analyzer, FRA (including software) a. Frequency Resolution: b. Input Range (Bias Voltage Range)	Frequency range:10 μ Hz–1 MHz or better 0.003% ± 5 V

	<p>c. AC amplitude</p> <p>d. FRA results</p> <p>e. Oscilloscope</p>	<p>0.2 mV to 350 mVrms in potentiostatic 0.0002 to 0.35 times the current range in galvanostatic</p> <p>Bode Plot, Nyquist Plot, Epsilon plot, Mott Schottky Equivalent Circuit fitting Subtraction of elements Kramers - Kroning test to determine the validity of the measured data.</p> <p>Built in oscilloscope windows to monitor the applied and measured sine waves in real time</p>
17	Interface	<p>USB for PC (or any other mode) with facility to operate from PC 16-bit A/D converter or better</p>
18	System should be able to perform Electrochemical Techniques (including the required software)	<p>a. Voltammetry: Cyclic & Linear Sweep Voltammetry Sampled DC - Voltammetry, Normal pulse, differential pulse and Differential normal pulse voltammetry. Square wave voltammetry, Staircase potentiostatic and galvanostatic</p> <p>b. Chrono Methods: Chrono – amperometry, chronocoulometry and chrono potentiometry</p> <p>c. Other Electrochemical Techniques DC and differential pulse amperometry Potentiometric Stripping Current and Potential Noise measurements, at open circuit A sequence of up to 10 potential steps and linear</p> <p>d. Tafel plot</p> <p>e. FRA and software for EIS measurements Performs potentiostatic and galvanostatic impedance Impedance Range: 10μHz to 1 MHz Measurements at open circuit potential.</p>

		<p>f. IR Compensation : current interrupt and positive feedback.</p> <p>g. AC voltammetry</p> <p>h. Cyclic charge discharge, discharge in various modes, polarization curves with loads</p>
19	Electrode/Cell Connections	2, 3, or 4 (provision for 4 connections is essential)
20	Desirable Software Features	Convolution and de-convolution, IR compensation, Automatic and interactive peak search, Integrators, Base line correction, Linear regression, FFT and Weighted moving average
21	Faraday Cage	One with minimum dimension: Width-30cm, Depth: 30 cm, Height 42 cm with at least six opening of size more than 0.5 inch and less than 1.5 inch and one glass window for viewing
22	Essential Accessories	<p>Connecting cables and other essential accessories should be included. Also</p> <p>a. A glass cell with Haber-Luggin- capillary (H-L) for reference electrode.(4 necked). 50 ml capacity and 100 ml</p> <p>b. Ag/AgCl Reference Electrode , Calomel electrode & Pt working and counter electrodes (indicate price separately)</p>
23	<p>Other Optional Accessories (Quote for each of the accessories separately)</p> <p>a. Current Booster</p> <p>b. Software for extraction of reaction mechanism from experimental data</p>	<p>To increase current up to 10A</p> <p>Software for analysis of data that can suggest/provide reaction mechanism</p>

Terms and Conditions:

- Quotations must be made in sealed envelopes technical and commercial bid must be sent separately in 2 sealed envelopes and then put together in one envelope. The quotes must reach the following address by **28/09/2011 by 17:00** hours latest.

Prof.A.N.Bhaskarwar
Department of Chemical Engineering,
Indian Institute of Technology, Delhi
Hauz Khas NewDelhi-110016

- Please quote prices at FOB and CIP New Delhi, inclusive of installation charges.
- Quote should be in Indian Rupees as well as foreign currency (if applicable) and to be valid for at least three months.
- Attach all the technical literature and a list of similar installations done in India.
- A minimum of one year comprehensive on-site warranty, also mention cost for warranty for three years.
- Mention if you can provide any technical support like training of IIT Delhi personnel at IIT Delhi or in your factory and providing a technical person for operation of the machine for initial period of 2 years. Kindly mention about this in the technical bid.
- If the quote is being submitted by the representative of the Principals/ manufacturers themselves, a valid Agency-ship/ Dealership Certificate authorizing the agent to quote to IIT Delhi on behalf of Principal should be enclosed.
- The Institute reserves right to reject/accept any/all quotations without assigning any reasons thereof.
- Complete set of manuals for the operation and servicing of the equipment should be given. All circuit diagrams, other mechanical and electrical schematics must be provided to Main unit, subsystems and accessories.
- Delivery period 4-6 weeks on receipt of PO.
- Clearly specify installation requirements – such as space, power, frequency, environment (Temperature, humidity) etc.
- If the items quoted are proprietary in nature, please enclose proprietary certificate from the principals stating “certified that ---- is a proprietary item of M/s ----- and no other manufacturer make these items”.
- If the bidder is Indian agent, the agency certificate should be enclosed.
- Please produce compliance certificate for the specification.
- Please ensure that the Indian agent has been enlisted with the Department of Expenditure, evidence may please be attached.
- Quote separately for models of higher specifications also.
- Educational discount should also be mentioned.
- No advance payment will be made.

Remarks: The Institute reserves the right to accept or reject any all the quotations without assigning any reason thereof.

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NOTE: The pages are to be displaced on the IIT website

