GOVERNMENT ENGINEERING COLLEGE, THRISSUR
NOTICE INVITING eTENDER

#documentNo D1/10427/23/GEC TCR #dated 10/05/2024

Tender No. : **D1/06/24-25**

Superscription : Purchase of Electrochemical Workstation for Mechanical Production Engineering Lab

Bidding fee : Rs. 2200 /-(1800+18% GST)
EMD required : Rs. 9000/-
Address of the Officer to whom hardcopy is to be sent. : THE PRINCIPAL, GOVERNMENT ENGINEERING COLLEGE, THRISSUR-680009

Specification Details

SL.NO.	NAME & DESCRIPTION	QUANTITY
1	ELECTROCHEMICAL WORKSTATION (POTENTIOSTAT/GALVANOSTAT/EIS)	1 NOS
Detailed specification attached.		

General conditions

1. The unit price, all other charges such as delivery, transporting, packing, shipping, loading and unloading charges etc, and GST must be shown separately and should be furnished unambiguously.
2. Payment will be made only after the successful supply, installation and testing.
3. F.O.R: Govt. Engineering College, Thrissur.
4. Agreement: Preliminary Agreement in Rs.220/- Kerala Stamp Paper.
5. Date of opening of tender: In case the proposed date declared as holiday, the tender will be opened on the next working day.
6. After E-tendering the hard copy of all documents should be submitted before the date of opening of the tender to the Principal, Government Engineering College, Thrissur.
7. Items to be supplied at Production Engineering Department of Govt. Engineering College, Thrissur.
8. The items should have a minimum guarantee period of one year from the date of installation and successful performance.
9. Installation, successful demonstration and training required.
10. Delivery Period: Immediately after the date of receipt of supply order.
11. 5% security deposit along with agreement should be furnished within a month/fortnight from the date of receipt of supply order.
12. Only GST Registered firms should participate in the tender.
13. Bidder shall be responsible for installation / demonstration as applicable and for after sales service during the warranty and thereafter.
14. Installation and demonstration to be arranged by the supplier free of cost and the same is to be done within 15 days of the arrival of the equipment at site.

NB: The Tender procedure will be made as per Rules mentioned in the Revised Store

Purchase Manual. The bidders should participate this tender through E-Tendering System. Tender cost and EMD should be submitted only through online. For more details Contact Ph.0487 2334144.

Dr. SHALIJ P R
PRINCIPAL

Approval Valid

Digitally Approved By
Dr. Shalij P R
Date: 10.05.2024
Reason: Approved

Technical Specification for Electrochemical workstation	
Compliance Voltage:	Standard ± 20 V or better at ± 400 mA current
Maximum Output Current:	± 400 mA or better at 20 V.
Output Voltage Range:	± 10 V or better
Maximum scan rate:	1000V/s with 15 mV steps or higher
Current Ranges:	± 10 nA to current range 100 mA in eight or more ranges
Measured current accuracy	0.0003% of current range (30 fA at 10 nA range)[Must be a default hardware configuration without any additional external accessories or current boosters – Required]
Current boosting option:	Expandable anytime to ±10A measured current or better with Current Booster at unchanging compliance voltage of ± 20 V and 0.0003% measured current resolution
Measured Potential Resolution:	3µV or better
Potentiostat Rise/fall Time	< 300 ns or lower
Input bias current	< 1 pA
Bandwidth of electrometer	> 4 MHz
Input impedance of electrometer	> 100 GOhm // 8 pF
Built-in Current Integrator:	We require to separate faradaic current from capacitive current and also directly measure integrated charge in real-time rather than current
Built-in Electromagnetic Noise filter:	The system hardware must have internal third order filters for removing background noise
Interface:	USB interface for connection with PC.
Capability for hybrid measurements	The system must have capability for hybrid measurements such as E-SPR, S-ECM, Spectro-electrochemistry, IMPS-IMVS, EQCM, etc. It should have TTL triggering, ADC, DAC based communication ports. Necessary technical documents to be submitted.
Requirements for EIS analysis	• Applied Frequency Resolution: 0.003% • At 1 Hz frequency, impedance of 0.01 Ω must be determined with 0.3° Phase accuracy & 0.3 % measured impedance accuracy. i.e – Measured impedance = 0.01 ±0.00003 Ω - **Required** • Frequency Range with External Waveform generator: 10 µHz to 32 MHz • Frequency Range with PSTAT/GSTAT: 10 µHz to 1 MHz at a maximum current of ±400 mA currents • Required – Real time fit-simulation, live lissejous plots, live 3D plotting. • Preferred Option– An Advanced EIS software that selects

	equivalent circuit by itself
Software requirements:	The Software must be able to be downloaded to unlimited computers, free updates & fully windows based. Software should be capable of supporting a wide variety of electrochemical techniques as mentioned below: • **Corrosion**: Linear polarization with Tafel Slope Analysis, Polarization resistance evaluation, Electrochemical Noise analysis, critical pitting technique, electrochemical frequency modulation, hydrogen permeation analysis etc. • **Battery & Supercapacitor Analysis**: Rectangular CV analysis at varying scan rates for pseudo capacitor analysis, complete charge and discharge with built in integration and 'linkable' cut-offs, Galvanostatic charge discharge with cycle number vs specific capacitance plot, Voltage measurement on counter electrode, GITT, PITT, etc. • **Solar Cell / Fuel Cell Studies**: Linear polarization, I-V plotting with automatic determination for max power point & fill factor, IMPS-IMVS evaluation, EQE / IPCE Analysis, Charge extraction, Photo-current response, Mott-Schottky plots for single frequency scan, automated band-gap analysis, etc. • **Electro-catalysis / Electro-deposition**: ORR analysis using RDE/RRDE at varying rotation speeds and built-in Kotecky-levich plot generation, HER and OER Tafel based analysis for water splitting, Carbon dioxide reduction analysis, default plug-n-play protocol for spectro-electrochemistry based LSV, CV and Chrono evaluation, Galvanostatic CV and Chrono, ASV, DPSV, etc. • **Trace Metal Analysis / Polarography**: DPSV, ASV, Chrono Coulometry, etc. • **Sensors**: Automated one-click protocol for CV and LSV analysis at varying scan rates, fully automated single click amperometric detection protocol, EIS measurement with real-time equivalent circuit fit option, etc. • **3D Based Live Plotting**: Powerful graphic engine with useful features such as vector graphics, individual axis scaling, overlays, multiple Y-axes, plot addition, real-time 3D with zooming and rotation. Minimum 10+ plot could be plotted simultaneously. • **Software should be freely upgradable in future**. The model and the software capability offered should be well documented in the brochure/catalogue and should be available at Principal website.

Electrochemical Cell for corrosion Accessory:	• Vendor to provide cell with 250-300ml capacity for corrosion measurements with square coupons of different sizes along with necessary reference and counter electrodes, and other accessories. • Along with corrosion cell, electrochemical cell consisting of 50 ml beaker with lid, Glassy carbon electrode, reference electrode (Ag/AgCl & SCE) and Platinum counter electrode to be supplied for electrochemical studies.
Computer Station:	• A suitable branded Computer like Dell or Compaq or equivalent for system control & data acquisition should be offered with the system. It should have following minimum specs: • CPU Intel Core i5 or higher, RAM 8 GB RAM, SSD 500 GB, GPU Direct X 9.0c compliant display adapter with 1GB RAM, TFT Monitor 21 inch, 101 Keys Keyboard, Optical Mouse, 3 USB Ports (minimum). Software should be freely upgradable in future. The model and the software capability offered should be well documented in the brochure/catalogue and should be available at Principal website.
Future Expandability	• **Any-time Switchable Option 1 Vs EIS:** A Multiplexer Module to allow Sequential Electrochemical Measurement from 4 to 64 independent Cells: Future Expandability • **Any-time Switchable Option 2 Vs EIS**: A dual-mode bipotentiostat module for electro catalysis measurements using RRDE set-ups or sensor research • **Any-time Upgradation to existing system**: A high current booster for a full-range ±10A measurable current with ± 20V compliance at a current resolution of 0.0003% or better.
Warranty:	1 year (or more) Manufacturer's Warranty Certificate is needed
Note	• Vendor to quote necessary accessories for studying biosensors along with minimum 70 or above carbon screen printed electrodes. • Terms and conditions for **Annual maintenance Contract (AMC)** • Vendor should be an authorized provider of sophisticated high-precision potentiostat/galvanostat systems for past 15 Years or more with a • A proven track record in multiple countries and national institutes • Standard quality certifications such (ISO 9001) • 10+ past installations of similar systems in India in past two years.