CENTRAL INSTRUMENT FACILITY

SAMBALPUR UNIVERSITY, JYOTI VIHAR-768019, SAMBALPUR, ODISHA

No. 3897/CIF

Date: 26.08.2025

QUOTATION CALL NOTICE

Sealed quotations are invited from intending manufacturers/ dealers/ suppliers/ firms with valid GST certificates for supplying various equipments/instruments to be purchased from **PM USHA** grant on or before 24.09.2025 up to 4.00 PM. The details of the requirement can be obtained from the undersigned or may visit Sambalpur University website (www.suniv.ac.in). The authority reserves the right to cancel the quotation without assigning any reason thereof.

Sd/-

Registrar, Sambalpur University

Memo No. 3897-A/CIF

Date: 26.08.2025

Copy to:

1. Deputy Director, Advertisement, Information and Public Relation Department, Govt. of Odisha, Bhubaneswar with a request to publish the advertisement in following Odia/English dailies with minimum size as prescribed by I&PR Department, Govt. of Odisha on or before 02.09.2025
   A) The Samaja (All Odisha Edition)
   B) The Times of India (All India Edition)
   He/She is further requested to submit the bills in triplicates to the Registrar, Sambalpur University along with the copy of the advertisement for payment.

2. Director, E-Governance, Sambalpur University to upload to the University Website.

26/08/2025

Registrar
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Jyoti Vihar-768019

INFORMATION BOOKLET

ON

QUOTATION CALL NOTICE

PM USHA FUNDED INSTRUMENTS FOR CENTRAL INSTRUMENTATION FACILITY

(Ref: 3897 – 3897(37)/CIF, Dated: 26.08.2025)

SAMBALPUR UNIVERSITY

JYOTI VIHAR, BURLA-768 019, ODISHA

Registrar
Sambalpur University
Jyoti Vihar-768019

Ref. No. 3897/CIF *Dated: 26.08.2025*

QUOTATION CALL NOTICE

Sealed quotations in duplicate are invited from the interested Manufacturers/Authorized dealers/Registered firms to supply the following items for the PM USHA funded Instruments for Central Instrument Facility (CIF), Sambalpur University, **on 'FOR' destination basis**. The last date of submission of quotation is 21.09.2025. Valid copy of PAN/GST No. and a bank draft of 2.0% of the quoted price as EMD, drawn **in favour of Comptroller of Finance, SU** of any bank **payable at State Bank of India, Jyoti Vihar Branch, Burla, code No.6672.** The EMD should be enclosed along with the quotation; otherwise, the quotations will be rejected. The Registrar reserves all right to reject any or all quotations without assigning any reason thereof.

Terms & conditions:

1. The quotation shall be submitted with separate technical specifications and financial bid in a sealed cover. On the top of the envelope please mention **'PM USHA-CIF-SU- Ref. No.- instrument name'**, for which quotation is being submitted in bold. Separate quotation have to be submitted for each Ref. No. /instrument.

2. The sealed quotations in the name of the **'Registrar, Sambalpur University, Jyoti Vihar, Burla, Odisha 768019'** will be received up to 4.00 P.M. on all working days up to **24.09.2025** by speed post/registered post only. The quotations may be sent to **Prof. Rajib Padhee, School of Physics, Sambalpur University, Jyoti Vihar-768 019, Sambalpur, Odisha.**

3. The suppliers must be either the manufacturer of the instruments/equipment or the authorized dealer/agent/representative of the manufacturer. In the case of dealer/agent/representative, certified valid copy of the dealership/agency/authorization issued by the manufacturer should be enclosed with the quotation.

4. The detailed specifications and other necessary information of instrument/equipment (with separate reference number) are given in this notification. The suppliers may refer to the desired instrument/equipment.

5. **The rates/price should be quoted in Indian currency.** The F.O.R – Sambalpur University and prices should include GST as applicable as per Government of India policy.

6. Delivery of the instruments shall be at the "Central Instruments Facility Centre", Sambalpur University, Jyoti Vihar-768 019 unless otherwise specified. **The price shall be inclusive of all taxes, transportation cost and cost of installation/commissioning, trial operation, comprehensive training and clearance charges (FOR Sambalpur University, Jyoti Vihar).** Necessary documents for clearing the consignment through customs authorities will be provided by the university.

7. The supplier must have supplied at least one similar EQUIPMENT/INSTRUMENT to any Government Research Laboratories, Educational Institutes or Industries, in last five years. Supporting documents such as P.O. Copy and corresponding installation certificate against the same needs to be furnished.

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8. The successful tenderer should supply and install the instrument/equipment within a period of 12 weeks from the issuing date of purchase order by the Registrar, Sambalpur University.

9. **100% payment after delivery and installation of the ordered items through NEFT/RTGS by the Department of Higher Education, Government of Odisha.**

10. The EMD of the successful tenderer will be refunded after completion of the supply and installation of the equipment to our satisfaction.

11. Documents such as instrument operation, calibration, maintenance, drawing, descriptive literature etc., if any, along with original instruction and data analysis manual should be supplied by the successful tenderer along with the equipment.

12. Instruments/equipment should be unpacked in the presence of the concerned person of Sambalpur University. The consignment will be accepted only after inspection.

13. Inspection certificates of the instrument / equipment inspected by the qualified engineer of the manufacturer and packed in accordance with the terms and conditions of this order must be enclosed.

14. During the warranty period or later whenever the firm is called upon to attend to the rectification of the defects/faults in the consignments, the firm shall attend to the repair work within a week. They should render timely back up service whenever called upon. **A certificate to the effect should be attached to the tender**.

15. **A certificate to the effect that instrument/equipment supplied is fully operational and no additional accessory or spare is required to make the instrument/equipment run should be issued along with the delivery challan/invoice**. The Registrar, Sambalpur University reserves the right to refuse payment in the event of not furnishing this certificate at the time of supply.

16. The Registrar, Sambalpur University reserves all the right to accept/reject any tender without assigning any reason thereof.

17. **Once the rate is approved by purchase committee, purchase order is placed on the successful tenderer for supply of the equipment/instrument.** The decision of the Purchase Committee shall be final and binding.

18. For any query regarding the tender notification write to : rajibpadhee@suniv.ac.in or hirak@suniv.ac.in

19. All disputes subject to Court of Law in the jurisdiction of Sambalpur.

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Ref. No. 3897(1)/CIF Date: 26.08.2025

Supply and installation of THERMO-GRAVIMETRIC ANALYZER (TGA)

TECHNICAL SPECIFICATIONS

- The system should be a highly sensitive Thermo Gravimetric Analyzer (TGA)
- Furnace design: TGA system/unit shall be either vertical or Horizontal design with flexibility of single or dual pans capability
- TGA shall have temp-controlled balance housing for better Ultra micro balance performance for its stability. Furnace shall have Pt/Pt- Rh elements and sensor will be Pt/Rh for temp measurements.
- Temperature Range: Room Temperature to 1100°C or better
- Temp and Mass Calibration standards: To be carried out using Pure Metal standards like In, Sn and Ag to cover complete temp range or using magnetic standards like Al, PerkAlloy and Ni.
- Scanning/ Heating Rates should be the minimum of 0.1°C to 150°C per min or better.
- Temp Accuracy: ± 0.5°C or better with calibration standards.
- Temp precision: ±0.1°C or better with calibration standards
- Balance Drift: From RT-1000C: ≤ 10 µg; Balance Stability: From RT-1000C: ≤ 10µg
- Balance repeatability: From RT-1000C: ≤ 10µg; Balance Resolution: 0.1µg or better
- Differential Thermocouple Method
- Built in mass flow controller for two gases

Typical Sample amount max 200mg

- Auto sampler Max 50 Samples (Optional)
- High temperature furnace upgradeable up to 1500 °C
- Sample observation Real View (Patented) upgradeable
- Furnace cooldown time: Less than 20 minutes
- TG Balance dynamic range: ± 400 mg; Environmental Temperature Stability: <3 µg/ degrees C
- DTA measurement range: ± 1000 µV; Sensitivity: 0.06 µV
- Furnace Movement: Opening and closing of furnace shall be through push button or software.
- Furnace Design or construction: It should be with ceramic protection and Pt/Ir heating elements and with additional embedded temp sensor in winding to ensure best temp accuracy and precision.
- Gas Flow Controls: Built in mass flow controller using software for gas flow setting and auto switch over at set time or temperature. The flow rates set shall be upto 200ml/min to clean the furnace from time to time.
- Temperature Modulation: Total heat flow specific heat component and kinetic component
- Gas flow rate: 0 to 1000 ml/ min with MSF
- Gas Purge Types flexibility to be used: Ar, N_2, O_2, Air etc
- Sample Pans: Pt 10 numbers and Ceramic Pans 100 numbers to be quoted
- **Software:** Windows 10/11-based Thermal Analysis software for data collection and further analysis in Thermal Analysis. Multitasking and multi-module software with licensed version

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and working under Windows O/S for data acquisition and storage. All the parameters like DTA, TGA, DTG are measured and displayed on the screen for calculations. The software has the flexibility to measure data with respect to temp and/ or time. Various calculations like mass change, % change, derivative calculations, peak area, on set point, onset temp, end point, peak point, baseline correction, add, subtract, display of more curves on the screen, smoothening of data, slope adjustment, overlay of curves are built in. The software has capability to export data in excel or other suitable format. It is supplied with calibration routines for temperature, enthalpy, mass calibration for regular calibration purpose. Software like Kinetics, Controlled Rate Thermal Analyzer (CRTA) or High Resolution or Auto step, Simulation software, should be quoted with TGA package.

- Branded PC for the data acquisition and analysis
- Auto sampler upgrade feature: The system shall be upgradable with minimum 40 position auto sampler and desired quantity of Pt and ceramic pans to be included with offer as mentioned above.
- Future Upgrade to Camera attachment: The system shall have provision to upgrade TGA with Camera attachment in future.
- Instrument should be supplied with a Branded online UPS of 5 KVA with 30 min backup.
- Warranty: Either Five Year warranty or ONE YEAR Warranty and Four Years AMC

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Ref. No. 3897(2)/CIF

Date: 26.08.2025

Supply and installation of PIEZOELECTRIC DISPLACEMENT SENSOR AND SAMPLE HOLDER FOR BULK CERAMIC SAMPLES UP TO 230 C WITH 10 KV POWER SOURCE

TECHNICAL SPECIFICATIONS

The setup should include the following as per the specifications given:

- The system should be 100% compatible with the existing Radiant's Precision Premier II, 100V Built-in system, High Voltage Interface 10KV
- Displacement Meter with 100 nm to 6 mm range of displacement measurements for Bulk Ceramics
- Resolution of Displacement sensor: 100 Nano Meter
- Sample holder rated to 10 KV
- Sample holder should have in-built oil bath
- The test system should have Noise Free table
- Temperature range: Room Temperature to 230 °C using Radiant's Vision software.
- The system should have Piezoelectric Software package.
- The system should have a 10KV High Voltage source attached to the same with specs as mentioned below:
  Output voltage and current range:
  - 0±10 kV or 20 KV peak to peak
  - Overload and over current protection
  - 170 V/us Skew rate

All information regarding every specification/ measurements /calculation should be mentioned in the company website. Data in typed format on company letterhead is also unacceptable (data must be supported with evidence/ research papers on company website only). Bids that are not supported by literature on company website will be rejected without giving any notice. All data will be checked/ cross checked from the company website.

- Instrument should be supplied with a Branded online UPS with 30 min backup.
- Warranty: One year from the date of installation.

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Ref. No. 3897(3)/CIF

Date: 26.08.2025

Supply and installation of ELECTROCHEMICAL ANALYZER /WORKSTATION INCLUDING ELECTRODES

TECHNICAL SPECIFICATIONS

The quotation should include all the accessories mentioned below.
The setup should include the following as per the specifications given:

➢ **No of Channel- 4**

Real independent **4** -channel potentiostat /Galvanostat / EIS. All channels connect to **4** independent cells and do the experiment in each channel simultaneously & together.

➢ **Hardware configuration**

- Cell connection/Electrode Configuration: 2, 3, 4 electrode measurements
- Applied Potential: **±10V or Better**
- Compliance voltage: **± 20 V or Better**
- Mini Current Range: **± 2 nA or Better**
- Max Current: **± 2 A (Without Booster) or Better**
- Impedance Spectroscopy Frequency range: **10µHz - 1MHz or Better**
- Current sensitivity: **1pA or Better**
- Potential control accuracy: **0.1%×full range or Better**
- Applied Potential Resolution: **15µV or Better**
- CV and LSV scan rate: **0.001mV~10,000V/s or Better**
- Scan rate: **0.001mV - 10,000V/s or Better**
- Potential Rise time: **<1us or Better**
- Reference electrode input impedance: **10^{12} or higher or Better**
- USB / RS232 Communication
- Windows Operating Software with lifetime free upgradation.

➢ **Software supported Techniques:**

Voltammetry

- Linear Sweep Voltammetry (LSV), Cylic Voltammetry (CV), Staircase Voltammetry (SCV),
- Square Wave Voltammetry (SWV), Differential Pulse Voltammetry (DPV),
- Normal Pulse Voltammetry (NPV), Differential Normal Pulse Voltammetry (DNPV),
- AC Voltammetry (ACV), 2nd harmonic AC Voltammetry (SHACV),
- Fourier Transform AC Voltammetry (FTACV)

Battery test

- Battery Charge and Discharge, Galvanostatic Charge and Discharge (GCD),
- Potentiostatic Charging and Discharging, Potentiostatic Intermittent Titration Technique,
- Galvanostatic Intermittent Titration Technique

Electrochemical Impedance Spectroscopy (EIS)

- EIS vs Frequency (IMP), Galvanostatic EIS, EIS vs Potential (IMPE)(Mott-Schottky),

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- EIS vs Time (IMPT), Galvanostatic EIS vs Time,

Stable polarization

- Open Circuit Potential (OCP), Potentiostatic (I-T curve), Galvanostatic,
- Potentiodynamic (Tafel plot), Galvanodynamic (DGP), Sweep-Step Functions (SSF)

Transient Polarization

- Multi Potential Steps, Multi Current Steps, Potential Stair-Step (VSTEP),
- Galvanic Stair-Step (ISTEP)

Chrono Method

- Chronopotentiometry (CP), Chronoamperametry (CA), Chronocaulometry (CC),

Amperometric

- Differential Pulse Amperometry (DPA), Double Differential Pulse Amperometry (DDPA),
- Triple Pulse mperometry (TPA), Integrated Pulse Amperometric Detection (IPAD),
- Stripping Voltammetry, Potentiostatic Stripping, Linear Stripping,
- Staircase Stripping, Square Wave Stripping, Differential Pulse Voltammetry Stripping,
- Normal Pulse Voltammetry Stripping, Differential Normal Pulse Voltammetry Stripping

Corrosion Measurements

- Cyclic polarization curve (CPP), Linear polarization curve (LPR),
- Electrochemical Potentiokinetic Reactivation (EPR),
- Electrochemical Noise (EN), Zero resistance Ammeter (ZRA)

Extensions

- Data Logger, Electrochemical Stripping/ Deposition,
- Bulk Eletrolysis with Coulometry (BE),
- Rs Measurement

➢ **<u>Accessories</u>: (Accessories must be quoted along with the Main unit together)**

1. **Multichannel Battery Tester: 1 No.**
   - No. Of Channels: 8
   - Maximum Charge & Discharge Current: **5A or Better**
   - Maximum Charge & Discharge Voltage: **5V or Better**

2. **Calibrated Light Source: 1 No.**
   - Type: **LED Based Study State (Combination variable wavelengths 390nm, 450nm, 515 nm, 600nm, 630nm, 660nm, 730nm, 850nm, 950nm)**
   - Spectral Deviation: **< 70% or Better**
   - Spectral Coverage: **> 80% or Better**
   - Lamp Life: **10000 Hrs. or Better**
   - Must have the facility to control the power level of each **LED** individually and together through Software.

3. **Luxmeter for Light intensity measurement: 1 No.**
   - Digital Luxmeter
   - Range: 0-200000 Lux or Better.

4. **Hydraulic Manual Coin Cell Cutter: 1 No.**
   - Standard configuration: φ14mm punching die

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- Punching stroke: 25 mm
- Punching thickness: 0.005-0.5mm electrode and separator

5. **Coin Cell Punching Machine:** 1 No.
   - Electrode Punching Die: **19 mm or Better**
   - Punching Thickness: **0.5mm or Better**

6. **Coin Cell Case: 500 Nos.**
   - **Material: Stainless Steel.**

7. **Spray Coater:** 1 No
   - Maximum operating temperature: 85^0C
   - Operating frequency: 120 KHz ±10%
   - RF output: Bulk head BNC connector
8. **Sealed Cell Setup:** 3 Nos.
9. **Swigelok with 2 Electrodes Setup:** 2Nos.
10. **Swigelok with 3 Electrodes Setup:** 1No.
11. **Electrodes:**
    - **Hg/HgO:** 2Nos.
    - **Hg/$HgSO_4$:** 2Nos.
    - **Pt Working Electrode:** 2Nos
    - **GC Working Electrode:** 2Nos
    - **AU Working Electrode:** 2Nos
    - **Pt Wire Counter Electrode:** 2Nos
12. Data Acquisition System: 1 no.
    Branded System with: i7 Processor, 8 GB RAM, 512 SSD, Monitor, Keyboard Mouse.
13. Online UPS: Branded 3 KVA Online UPS with 30m Backup

- Warranty: 3 Years warranty and 2 Years AMC after the warranty period.

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Ref. No. 3897(4)/CIF **Date: 26.08.2025**

Supply and installation of SPIN COATER

TECHNICAL SPECIFICATIONS

- Programmable Spin Coating System with Vacuum Pump
- Working Chamber Diameter: 200 mm or better with PTFE coated SS
- Programmable Speed Range: 100 -10,000 R.P.M or Better
- Programmable Acceleration Period: 1- 250 Seconds or Better
- Real-time Display of R.P.M vs. Time in 4 Line LCD Display
- Instrument should be supplied with a Branded online UPS with 30 min backup.
- Warranty: 3 Years warranty and 2 Years AMC after the warranty period.

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Ref. No. 3897(5)/CIF

Date: 26.08.2025

Supply and installation of ROTARY EVAPORATOR, VACUUM PUMP AND RE-CIRCULATING CHILLER

TECHNICAL SPECIFICATIONS

Rotary Evaporator:

- Electronic lift with provisions for automatic lifting of the flask in case of power failure.
- Rotation speed: up to 280 rpm or better with microprocessor control.
- Cooling surface area: 1500 cm^2 or better
- Multifunctional combi-clip for easy removal and fixation of evaporating flask
- Adjustable immersion angle for the use of different flask sizes.
- Vertical condenser: P+G coating
- Digital display: Set and actual bath temperature, rotation speed and lift position.
- Bath temperature range: from ambient to 200 °C or better with an accuracy of ± 1 °C.
- Automatic overheat cut-off protection, Evaporating flask from 50-5000 ml can be used on the same joint adapter, Bath capacity: up to 5 Liters, should be supplied with auto distillation Sensor, IP 21 Protection Class

Vacuum Controller Interface

- Control unit: Touch screen LCD display for centrally controlling all process parameters of a Rotavapor.
- Clockwise and anticlockwise rotation of evaporating flask.
- Overpressure sensor for automatic aeration.
- Integrated, extendable, solvent library for setting up individual solvent library of 40 or more solvents. All process parameters e.g., bath temperature, rotation speed, chiller temperature etc., should be graphically displayed to facilitate the supervision of distillation and gradient programming. Set of data can be exported on an SD card for further analysis and traceability purpose. Integrated leak test to check possible leaks and verify tightness of the system automatically. Woulff bottle included, IP 21 Protection Class

Vacuum Pump

- Single stroke Speed control vacuum pump with a flow rate of 1.8 – 2.0 m^3 /h. Low suction capacity results in poor vacuum and takes time to achieve desired vacuum.
- Ultimate Vacuum – 5-7 mbar or better
- Chemically resistant diaphragm made of PTFE
- **Glass window to check solvent build up and contamination.**
- Sound Level adjustable as per EN 61010-1 between 32-57 dBA.
- Power saving mode.

Re-circulating Chiller

- Temp. Range: -15°C to ambient,

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- Sensitivity ±1°C. (Room temperature 25°C)
- Working TempI5°C to 18°C
- Sensitivity better than ±1°C. (Room temperature 25°C).
- Coolant: R404A, CFC Free.
- Pump Capacity:3 Lit/Min. at 0.6 bar.
- Cooling Capacity:1538 watt at 7.20 C.
- Tank Volume:4.0 Liters (Approx)

Warranty: 3 Years warranty and 2 Years AMC after the warranty period.

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Ref. No. 3897(6)/CIF

Date: 26.08.2025

Supply and installation of ELECTROMETER SET UP WITH TEMPERATURE VARIATION AND VACUUM

TECHNICAL SPECIFICATIONS

Purpose: Electrometer Setup enables On-Wafer Device Characterization with minimum parasitic influence. Enables verification of devices Parameters.
The System shall consist of a probe station which must be able to interface (with all necessary adapters, cables, etc. The setup shall be integrated with probe station, high resolution microscope, Ambient Chuck, with capable of holding wafer with diameter up to 150mm. The probe station shall also include suitable accessories for wafer probing and vibration isolation platform

General Specification

The System must be able to support the following on-wafer measurement setup	Low leakage device measurement up to 500V/1A.
System Integration	The system must be able to integrate with test instruments for Wafer and Device Level characterization.
Chuck Stage Movement	Puck controlled air bearing chuck stage for quick single- handed operation
Wafer loading	Need to have clear view of chuck for the easy wafer loading
Platen	Ridged probe platen design with integrated air-cooling for maximum stability at different temperature testing
safety system	Safe contact feature locking the XY stage while in contact to prevent pads and probe damage due to accidental movements
Platen to chuck height	≥ 20mm

Mechanical Performance Specification of Probe System

Chuck Stage Movement	Manual
X-Y stage travel range	≥ 170mm (X axis) ≥ 230 (Y axis)
X-Y stage fine adjustment range	≥ 25mm (X axis) ≥ 25mm (Y axis)
Movement Resolution	< 1um or better
Planarity	<10um
Theta travel	360 deg
Theta travel fine adjustment range	+/- 5 deg
Theta resolution	7.5 x 10^{-3} gradient

Microscope Stage Specification

Movement Range	≥25mm (X axis) ≥ 25mm (Y axis)
Movement Resolution	5 um or better
Movement type	Independently controlled X and Y movement with locking screws
Microscope lift mechanism	90-degree tilt for easy and safety probe replacement or reconfiguration

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Probe Platen Specification

Material	Nickel plated steel
No of Micro Positioners support	10
Platen lift control	Contact (0), separation (300 µm), and loading (3 mm) Positions
Platen Z-height movement range	≥ 20mm
Separation repeatability	< 1 µm
Platen lift preset heights	Platen lift movement stop at 50, 100 or 150 µm alignment height for easy probe to pad alignment
Operator Safety and Compliance	CE certified. TÜV compliance tested according to EN 61010

Chuck System with Vacuum Pump

Wafer Chuck	Stainless Steel Chuck top with Vacuum Holes
Surface flatness and base parallelism	+/- 5um or better
Electrical isolation	> 0.5 T Ω at 25 °C
Force-to-GND	≥ 500V
Minimum Die Size Support	5 mm x 5mm
Maximum Wafer Size Support	≥ 150mm diameter
Chuck Diameter	≥ 160 mm diameter
Chuck Vacuum actuation	Center, 100, 150
Vacuum Switch	Easily accessible vacuum switches for chuck zones
Supported wafer thickness	≥80um

Microscope System

Microscope System Mount	Mounted on Microscope Bridge mount design
High Resolution Microscope	Microscope with camera port. Minimum 12X zoom range and greater than 40mm working distance
Zoom range	0.67x - 4.5x (6.7:1) with 25X eye piece
Focus and movement	50 mm focus block with fine movement, 90° tilt
Optical Resolution	≤ ±3.5 µm (able to probe 50 µm pads clearly)
Illumination	LED Source with external intensity control unit
TV Port (C-Mount)	1 X and with USB mount
Digital Camera for image capturing and live view	
Camera Resolution	≥ 8 MP
Video Capture Resolution	4K Resolution and can be stored in memory card
Video Output	HDMI and USB/ DVI/ VGA output
Software	Camera control software with operating system
LED Monitor	To view and connect with Digital camera for live view
LED Monitor Size	> 21 inch
Resolution	≥ 1920 x1080 pixel
Input	HDMI and USB/ DVI/ VGA input
Monitor Stand	Probe station table mount

Micro-Positioners and Accessories

Micro Positioner for DC measurement	4 positioners, Made of Carbon Steel Material Strong Magnetic base with on-off switch
Micro Positioner XYZ Travel range (Both DC & RF):	≥ 10mm or better
Micro Positioner Screw	300 µm / per turn

Resolution (Both DC & RF)	
Micro Positioner Mounting	Magnetic mount on platen with on/off magnetic switch
Probe Arms	4 Triaxial Probe arms with cables (2 meter long)
25 Probe Needle	- 7um tips (radius)
Source meter	
GUI Display	front panel GUI with 4.3-inch color LCD display with both graphical and numerical view modes
DC Source Voltage Range	± 200mV to ± 20V
DC Measuring Current Range	± 1μA to ± 1.5A
Output Power	20W or more
Min Voltage Source Resolution	1μV
Min Current Measure Resolution	1pA
Voltage Source accuracy	< 0.15% throughout the range
Current Measuring accuracy	<0.3% throughout the range
Capability	2-wire and 4-wire sourcing and measuring capabilities
Data acquisition System	
Branded Computer	i5 processor, 8GB RAM, 500GB SSD, 22inch display, Keyboard and mouse
Software	IV measurement software to be provided
Sample Stage	
Chuck Stage Size	2inch or larger
Sample holding	Vacuum holding chuck with vacuum pump
Temperature control	20deg to 60deg
Contact Probes	4 nos of Z- Micropositioner contact probe with magnetic base and electrically isolated contact probes

Instrument should be supplied with a Branded online UPS with 30 min backup.

Warranty
One year warranty and 4 years AMC after one year warranty

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Ref. No. 3897(7)/CIF **Date: 26.08.2025**

Supply and installation of HIGH TEMPERATURE FURNACE ALONG WITH SPARES

TECHNICAL SPECIFICATIONS

An electrically heated chamber-type front-loading furnace, with floor model construction in two sections: the upper section consists of the heating cavity assembly, while the lower section accommodates the thyristor system and other electrical and electronic components.

- Heating cavity dimensions: 125 mm width x 125 mm height x 250 mm depth (minimum)
- Expected Load: 05 kg.
- Operating temperature limits: 1400°C for a minimum of 2 hours, and a minimum of 1300°C for continuous operation.
- Time to reach maximum temperature: Maximum 5 hours.
- Shell Construction: Double Wall using high-quality fabrication of SS and MS angle structures with proper stiffeners, and it should be painted with rust-protective primer and heat-resisting paint.
- Insulation Refractory: The internal refractory should be resistant to fusion, cracking, or melting at the maximum working temperature, and the skin temperature should not exceed 30 degrees above ambient temperature.
- Door: an insert-type swing-aside moving door with a peephole and proper insulation

  Fabricated by MS angle, sheet and SS sheet combinations or better Fabricated by MS angle, sheet and SS sheet combinations or better Fabricated by MS angle, sheet and SS sheet combinations or better. Door Entrance: 125 x 125 mm Min
- Heating Elements: Silicon carbide heating elements make: EKL /SUSIC/ KANTHAL GLOBAR
- Power Supply / Rating: 400V 2/1 -Ph AC 50Hz / 08 KW max or equivalent
- Power control: Thyristor Power Drive System and High Amp transformer with cooling fan
- Thyristor: Thyristor Power drive system of Furnace should have following features: - Control unit with Digital Thyristor Power controller along with Digital Display. Basic functionalities such as Alarm/ Lock / Load profile shall be facilitated. Make: ABB/ GE POWER CONVERSION/MAKALI/ PARKER/ROCKWELL AUTOMATION/ SIEMENS/FUJI/AE
- Temp. Programmer/Controller: Microprocessor-based Digital PID Temperature Programmer/Controller, 16 segments or better. Make: Eurotherm/Honeywell/ Masibus/Radix)
- Thermocouple: Platinum-Rhodium Thermocouple (Type R) in a High Alumina Sheath
- Safety: Cut-off fuse or a better facility.
- Manuals & Drawing: The following shall be submitted in one set of soft copy and two sets of hard copies along with the supply of equipment: Operation & maintenance manuals, giving complete details and technical data namely maintenance schedule, electrical circuit diagram, catalogues of all electrical and mechanical parts List of spares/ fast wearing parts with detailed Make, Model drawings and specifications Any other documents/ drawings/ diagrams as may be felt necessary.
- Installation: The supplier will supply and install the furnace at Sambalpur University and will run the furnace up to its maximum working temperature in presence of Faculty/Lab Asst.. Installation will be termed as successful only if the furnace maintains its final

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working temperature for at least three hours without any major deviation in temperature, during the said trial run.

- Packing: The item should be packed properly to avoid any breakage. The Supplier shall be responsible for the stores being sufficiently and properly packed, for transport by rail/road/sea/air/ or any combination of above, so as to ensure their being free from loss or damage on arrival at the destination. Packing material shall not be returned to the Supplier, unless stated otherwise. The extant government guidelines with regard to packing material, wherever applicable, shall be adhered to by the supplier.
- Following things will be in the scope of tenderer:
  1) Supply and laying of suitable Incoming Power supply cable (of at least 50 metre length PVC Sheathed, PVC Insulated, 3.5 core X 50 sq.mm, Armoured Aluminium cable.) shall be in the scope of bidder. All Power & Control wiring & other electrical/electronic related jobs necessary to install the supplied furnace shall be in the scope of tenderer.
  2) If a dedicated and/or new earth pit is required for the furnace then it will be under the scope of the tenderer
  3) The tenderer shall supply/carry all the required tools, instruments for successful installation & commissioning of the system.
  4) The tenderer has to ensure the deployment of manpower, if required, for jobs like unpacking, handling, area cleaning, shifting of materials, or any electrical or civil work.
- Spares:

  The unit for these items shall be included and quoted in price bid.

  1) Heating element with all accessories Full set
  2) R type thermocouple with 99.9% Alumina sheath Full set
  3) Thyristor Power drive full set
  4) Temperature controller Full set
  5) Tongs & asbestos gloves Full set
- Warranty: Five years from the date of installation.

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Ref. No. 3897(8)/CIF **Date: 26.08.2025**

Supply and installation of HIGH TEMPERATURE MUFFLE FURNACE

TECHNICAL SPECIFICATIONS

Specification of Laboratory Muffle Furnace with Microprocessor PID Controller

Item	Description
Volume & Working Dimension	≥ 5 liters or more Workspace dimension – minimum W 225 x D 170 x H 125 (w x d x h) mm or more
Temperature	T-max = 1500°C T-max continuous operation≥ 1450°C T-max (Argon/ N2) ≥ 1450°C
Ramp Rate / Heating Speed	20°C /m to 100°C /m or wider range from room temperature to 1250°C Maximum time to T-max not more than 60 minutes
Uniformity	± 5 K according to DIN 17052-1
Temperature Measurement	Thermocouple type S / K or equivalent
Heating Element & Insulation	Heating from at least two sides with heating elements on support tubes for free radiation. Light weight refractory bricks insulation materials without categorization according to EC Regulation No 1272/2008 (CLP). High-quality insulation material which are not classified as carcinogenic according to TRGS 905, class 1 or 2 for furnace for the high working temperature as per latest international norms.
No. of Heating Zones	Single Heating zone
Door Opening Temperature	≤100°C
Control	Professional controls system to provide convenient operation of all functions Operation of all furnace functions via a large touch screen color display with clear visualizations of the process via graphical charts & tabular display of the program. At least 5 programs with 4 segments, delayed start time in real time. Temperature control Accuracy of ± 1 °C or better. Temperature and time input in per °C and per minute, respectively. Detailed information menu with: Time and date, program run times, operating hours counter, integrated kWh counter, error messages in plain text display, display of controller setting values, copy and delete function for programs or more The PID programmer controller must have the facility to auto start & resume the on-going program after a power outage / power failure. Should have controller interlock with password lock to protect against unauthorized operators. Should have in-built Wi-Fi interface for status monitoring with mobile end devices Over-temperature protection with automatic shutdown if the set target temperature is exceeded. The controller should be equipped with minimum 2 extra functions to

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	support additional functions such solenoid valves, acoustic signal etc. The controller should have option for retrieving recorded data on an external drive & recording of process data with USB Flash Drive The system should have the facility of writing Programs & Generating the reports on PC through external flash drive/pen drive. The controller should facilitate iOS / Android App-Functions (from Google Play store / App store) convenient monitoring of multiple furnaces simultaneously, dashboard, Individual overview of a furnace, display of active/inactive furnaces, operating status, current process data etc.
Construction & Design	Stainless Steel panel frame construction with maximum outside wall temperatures 60 °C + ambient air temperature. Furnace complies to ISO 13732-1 with Non-Rust Housing Texture Stainless Steel. Switchgear integrated in the sub-base, no external Housing allowed. Double wall casing with fan cooling for low exterior temperature. Controller operation at integrated in the sub-base of furnace. Inner chamber casing made out of heat-resistant stainless steel, reinforced bottom Compact table top design for ease of operation.
Air- circulation	Inlet for air-circulation inbuilt in furnace. Fresh air inlet in the furnace chamber.
Switching System	Switching with solid state relay
Vent Flaps	Exhaust vent for outlet of air in rear wall.
Electrical	Single-Phase, 230 V AC complying with Indian electrical supply.
Warranty	36 months from successful Installation Warranty certificate for 36 months
Special Instruction to Bidders	Diagram, layout drawing, wiring diagram, operating instructions including maintenance instruction
Manufacture, Availability Assembly and Testing:	The model, its specification and its available modification/ accessories must be presented in the manufacture's website on day before the first day of public display of the tender call. The product must be part of serial production of the OEM and not a one-off model. A certificate from manufacture certifying that the quoted/ proposed model/unit has already been pretested with all the accessories/fitting as per the claim and required specification needs to be provided while responding to the tender call. Mere copy-pasting from the asked specification list (completely or partially) will lead to disqualification in technical verification round. Provide user list (with contact details) where same unit has been delivered. Assurance for availability of all spares for at least 10 years after procurement. All documents/catalogue to proof the claims and descriptions needs to be furnished with statement from OEM if the specs are not standard equipment as per the OEM datasheets/websites, without which the claims will not the acceptable.

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Ref. No. 3897(9)/CIF **Date: 26.08.2025**

Supply and installation of POLING SYSTEM

TECHNICAL SPECIFICATIONS

1. 100 kV DC POWER SUPPLY FOR CORONA POLING (NEEDLE)
   1mA output [max], Voltage: 10kV – 100 kV, Digital Indications for Voltage, Current and Temperature on HMI.
2. PIN HOLDER ASSEMBLY
   Pin holder assembly to hold 2" x 2" substrate, independently adjustable distance from substrate and grid assembly.
3. SUBSTRATE HOLDER ASSEMBLY
   Substrate holder assembly designed to hold 2" x 2" substrate.
4. HEATER PLATE WITH HEATER
   Suitable Sample Heater Plate with Isolated Heater Assembly for holding substrate size of 2" x 2", Temperature Control from 25-250°C.
5. GRID ASSEMBLY
   SS mesh, Adjustable distance from pin assembly
   Grid Power Supply: 25 kV DC Power Supply, continuously variable voltage, 2mA (max) current, Digital display of Voltage and current on PC/HMI, Short circuit protection
6. STAND AND COVER
   Fully Engineered Stand with adjustable height to accommodate Pin Holder Assembly, Sampl Heater Plate and Grid Assembly with proper insulation. Acrylic Cover with door interlock [for Power Supply] for Operator safety.
7. AUTOMATION
   PLC-PC/HMI based Automation consisting of:
   Colour Touch Screen based HMI /PC Screen [Minimum 7" diagonal] with System MIMIC and Indication of High Voltage and Current, and PLC with Digital and Analogue Inputs for Interlocks and Current and Voltage Indication and Logging of Alarms
8. Complete Assembly in a Safe Egronomic Enclosure with HV Discharge Facility.
9. DOCUMENTATION
   Operator Manual consisting of Safety instructions, Essential Spare Parts and recommended spare parts list.

10. Basic Essential Requirement:

- Point to Plane as well as Corona Triode assembly
- Fine SS Mesh Grid Assembly
- Adjustable point-to- grid as well as Grid-to-sample distances
- Independent controls for Corona and Grid potentials
- Continuous Voltage control from 10 – 100 KV
- Grid Power Supply 5-25 KV
- Sample heating up to 250° C
- Acrylic cover with Door interlock (for Power supply) for Operator's safety
- HMI-PLC Based Automatic Control
- CE certified electrical components.
- Warranty: Five years from the date of installation.

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Ref. No. 3897(10)/CIF **Date: 26.08.2025**

Supply and installation of PLANETARY BALL MILL

TECHNICAL SPECIFICATIONS

Sl. No.	Parameters	Desired Specification
1	Grinding station	System should be capable of grinding and mixing in dual bowl simultaneously in double grinding station.
2	Multi-operational system designed for multi-feed input	The system should be suitable for size reduction, mixing, homogenizing, mechanical alloying and for feedstock of hard, brittle or fibrous material.
3	Jar capacity	System should be capable of using jars of volume 12 ml / 25 ml / 50 ml / 80 ml / 125 ml capacity Vendor has to Quote for 125ml Zirconium Oxide jars & Zirconium Oxide Grinding Balls of 5mm & 2mm diameter in sufficient quantity.
4	Instrument Type	Bench Top
5	Safety device	The system should be capable for Dry and wet Grinding
6	Feed Size & Final Fineness	< 4mm to <1 Micron and for colloidal grinding <.1 Micron
6	User-defined labelling	The jars should be provided with identification marks indicating the item number, material and volume to facilitate easy traceability. Space should also be available for user defined labelling
7	RPM	The jars should be capable of rotating at speeds up to 1300 rpm without spilling /leakage of the powders.
8	Diameter of main disk	Diameter of main disk should be Not more than in the range 150-160 mm.
9	Rotational speed ratio	The ball mill should consist of rotating base plate on which bowl could be firmly fixed, and it should be capable of rotating about its own axis with planetary action with speed ratio 1:-2.
10	Speed changing capability	It should be possible to continuously increase the speed of rotation of the base plate and the bowls. The base plate should have RPM in the range of 100– 650/min.
11	Weight	Weight of the Instrument should not more than 90 Kg, as Bench top Instrument is required.
12	Clamping of bowls	Bowls should be capable of being firmly fixed on the rotating platform so that they are capable of rotating about their axes and are not thrown off accidentally. The system should have provision for easy clamping device for tightening these bowls.
13	User friendly guidelines	The Planetary Ball Mill should feature a very convenient operator guide. All the relevant data should be easily feedable or called up via a colored graphics display with 1-button operation for speed, grinding time, energy input, grinding direction reversal with selection of running and pause times, remaining running time, display of drive load factor, operating hours and 10 combinations of speed, grinding time and interval settings for repetitive grinding tasks. (Touch screen display will not be accepted)

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14	User safety	The rotating parts shall be fully enclosed, and a safety locking system be provided such that the motor can be started only if the enclosure is placed firmly in position.
15	Jar and Instrument Protection a	Jar should have Safety Slider for safe Operation, and Perfect stability on the lab bench with Inbuilt FFCS technology.
16	Input electric power	The offered system should work on 230V, 50Hz, single phase power.
17	Motor	The motor for the drive system should be AC drive and of minimum 1200 watts power.
18	Operational speed	It should be possible to run the equipment/mill in a sequence of operation such as slow start to maximum speed, and a set time of rotation.
19	Cooling during operation	To enhance the performance of the system for continuous operation, suitable fans should be provided in the system to avoid over heating
20	Power backup	Power failure backup that ensures interrupt mixing.
21	High centrifugal force	Centrifugal acceleration should be greater than 32g
22	Safety standards	The instrument must meet the CE standard.
23	Product catalogue and URL	The original product catalogue and URL link of the quoted item should be included; all Parameter points should be mention in Catalogue as well as website.
24	Installation and Commissioning	Installation, complete interfacing of the system with its subsystems, and commissioning is to be carried out by the vendor's factory-trained engineers, followed by a demonstration of the system's performance to the user's complete satisfaction. An estimated time schedule for installation, Commissioning and training must be provided.
25	Training	The manufacturer/supplier of planetary ball mill should provide at least two days onsite training initially during installation.
26	Warranty	Five years from the date of installation.

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Ref. No. 3897(11)/CIF **Date: 26.08.2025**

Supply and installation of IoT KIT SETUP

TECHNICAL SPECIFICATIONS

Equipment	Specification
Raspberry Pi	4-8 GB Ram
Temperature and Humidity Sensor	DHT 11
Smoke Sensor	MQ2
PIR Motion Sensor	Module HC-SR501
Infrared Motion Sensor	HC-SR501 PIR Passive Infrared Motion Sensor
Rain Sensor module	
Soil Moisture Sensor module	5v
Air Quality Sensor for pollution	MQ 135
Sound Detection Sensor Module	MQ -3
Light Dependent Resister Sensor	
Digital Barometric Pressure Sensor Board Module	BMP180
ECG measurement pulse heart ECG monitoring sensor module kit	Robocraze Ecg module AD8232
LCD for display	16x2
Channel Relay Module 1	5V
GPS Module	NEO-6 M
Servo Motor	SG90
2 pin Light Emitting Diode	
Tactile Push Botton Switch	6x6 mm pin
4 pin RGB LED 5mm common cathode	
Resisters for LED	
RGB LED Jumper wires	
Microcontroller	Arduino Uno R3 ATmega328P 8 bit AVR RISC based
Non-Contact body temp sensor	MLX90614
Spo2 Sensor	MAX30102
Gas Sensor	MQ35
Barometric pressure and altitude sensor	BMP 280
Heart Rate Monitor Kit with AD8232 ECG sensor Module	
AD8332 cardiac Electrophysiology Measurement	
Pulse Heart Monitoring Sensor	
Electroencephalography EEG Sensor	
Oximeter and Heart rate Module	

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Ref. No. 3897(12)/CIF

Date: 26.08.2025

Supply and installation of DIP SOFTWARE AND HARDWARE

TECHNICAL SPECIFICATIONS

1. Hardware Specifications

1.1 High-Performance Workstation (Deep Learning Ready)

Component	Specification
Processor (CPU)	Intel Core i9-14900K / AMD Ryzen 9 7950X
GPU (Graphics Card)	NVIDIA RTX 4090 24GB GDDR6X (CUDA Core based - ideal for DIP/Deep Learning)
RAM	128 GB DDR5 (4 x 32 GB, 5200 MHz)
Storage	2TB NVMe SSD (OS + Dataset) + 4TB HDD (Backup & Storage)
Motherboard	ASUS ProArt Z790-Creator WiFi or equivalent
Power Supply	1000W 80+ Platinum Rated
Cooling System	Liquid Cooling (Cooler Master 360mm)
Monitor	Dual 27" 2K IPS monitors (Color Accurate - 100% sRGB)
Cabinet	Full tower with high airflow
Keyboard/Mouse	Logitech Professional Combo
UPS	APC 2KVA with LCD Display + Battery Backup

2. Camera Setup for Image Acquisition

2.1 Scientific Camera with Lens

Component	Specification
Camera	Basler Ace 2 Pro / FLIR Blackfly S (CMOS, USB 3.0, 12 MP)
Lens	12 mm – 50 mm variable focal length lens (C-Mount)
Mounting Kit	Adjustable stand with vibration damping
Lighting System	Ring LED light + Diffused dome light
Image Capture software	Compatible SDK with MATLAB/Python
Accessories	USB 3.0 Cable, Power Adapter, Tripod Mount

3. Software Tools

3.1 MATLAB Academic License with Toolboxes

Software Tool	Included Toolboxes
MATLAB	Core MATLAB
Image Processing Toolbox	For filtering, segmentation, enhancement
Computer Vision Toolbox	Object detection, tracking, feature extraction
Deep Learning Toolbox	CNN, Transfer Learning, Training Deep Models
Signal Processing Toolbox	For sensor data integration
Parallel Computing Toolbox	GPU Acceleration
MATLAB Coder (Optional)	For code generation

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4. Auxiliary Setup (Optional but Recommended)

4.1 GPU Server (Remote Access Node for Multiple Users)

- For multi-user access over LAN
- Dual GPU Node with RTX 3080 (or A6000 for industrial setups)
- Useful for training larger models on batches
- Miscellaneous (Cables, Stands, Cooling)

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Supply and installation of TEXTURE ANALYZER AND ITS PROBES

TECHNICAL SPECIFICATIONS

Instrument should be Integrated with adjustable base table having minimum diameter 160 mm. Operating Modes: Compression – Relaxation –Traction – TPA Cycle – Penetrometry and relative compression mode. This should have colour touch screen which allows comfortable use and optimal viewing of measurements. Data can be backed up and exported using a USB stick. Compatible Zigs and Probe to be supplied along with Instruments.

1. Display: 7" Color TOUCH Screen
2. Readout: Force, Speed, Distance, Temperature, Time, Measuring.
3. Probe, Level of Sensitivity, Date/Hour, Choice of Load cell, Unit in Gram or Newton.
4. Loadcell: Interchangeable from choice of 10N/1kg, 20N/2kg, 50N/5kg, 250N/25kg, 500N/50kg
5. Loadcell Resolution: 0.1g for 1kg, 2kg, 5kg and 1g for 25kg, 50kg
6. Accuracy: +/- 0.1% of Full-Scale Range
7. Speed Range: 0.1 to mm per second
8. Speed Accuracy: +/- 0.2%
9. Motion: Height: 200mm
10. Motion Height Resolution: 0.1mm
11. Temperature: Built-in PT100 Sensing range -50 deg C to +300 deg C
12. Data Output: Built-in Interface available RS232 & USB Ports
13. Power Requirement: 90-240V, 50/60Hz
14. Weight: < 30 Kg
15. Instrument should be supplied with a Branded online UPS with 30 min backup.
16. Warranty: 3 years standard warranty and 2 years AMC after completion of warranty period.

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Ref. No. 3897(14)/CIF **Date: 26.08.2025**

Supply and installation of CRUDE FIBER ANALYZER

TECHNICAL SPECIFICATIONS

- Automatic Four Place PC Compatible Auto sequencing Fibre Estimation System for determination of Crude fibre, NDF, ADF, ADL, Cellulose, Hemicelluloses, Lignin,
- Ceramic Infrared Heater. Digital Display
- Integrated auto sequencing time/temperature domain of 2 programs and 8 sequencing steps
- RS 232 interface for PC/ Laptop Connectivity,
- Temperature Controller should be isolated separately in a control tower to protect electronics from heat zone and acid reaction zone, with separate access door for main unit & electronics control tower unit.
- Fibrastat hot plate casted aluminium alloy heater with thermostatic control with electronics module totally isolated in a control tower.
- Sintered Silica glass Crucible with P1 Porosity disc (4 Nos.)
- Independent sample loading with individual mechanical controls
- Measuring Range: 0.1 to 100%
- Repeatability: ±1 % relative at 5% - 30% fibre level
- Reagent Preheating time: 15 - 20 min
- Electrical Requirement: 220v/50Hz. AC Mains.
- The instrument shall strictly confirm to the specifications with relevant brochure & Photograph with images.
- The OEM should have proof of long-term users using equipment for more than a period of 10 years showing longevity of operations
- The bidders/OEM must show online demonstration of the quoted system during technical evaluation of the bids. This is an essential requirement.
- The instrument should be approved registered brand, Certificates issued by Trade Mark Registry under Trade Marks Act 1999 (Govt. of India)
- Instrument should be supplied with a Branded online UPS with 30 min backup.
- Warranty: 4 years plus 1 year AMC

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Ref. No. 3897(15)/CIF **Date: 26.08.2025**

Supply and installation of FREEZE DRYER

TECHNICAL SPECIFICATIONS

- The freeze dryer should have wide solvent coverage and temperature option up to **-110 degree**.
- The system by itself, when equipped with manifolds or chambers, becomes a versatile freeze dryer.
- The system should come with compatible vacuum rotary vane pump generates vacuum down inside the chamber pump should be best quality. Vacuum value below 1Torr (0.001~760 Torr) vacuum pump: Rotary vane pump Pumping speed: 50Hz – 200 L/min
- Ultimate pressure: 0.0067 mbar
- Should have option for Oil Mist Trap (Vacuum pump set 3/3) for saving pump
- Important **point and requirement are Defrost Function available (Hot gas)** · Magnet embedded front cover of the condenser for very convenient cleaning.
- The system should come with Optional Pirani Sensor to display precise vacuum value below 1Torr (0.001~760 Torr)
- Importantly due to lab space small footprint is important Dimension: (W x D x H, mm) 400 x 660 x 570 less will be better
- System should be On-Wheels for easy transportation, and must be coming with Teflon coated, and easy to clear, robust.
- The System should CE certified and RoHS compliant, and should be having ice condensing capacity more than 3 kg and Cold trap volume of 4L.
- The supplier should have office and qualified service Engineer in Eastern part of India and provide prompt service support. If required, we will ask for proof of office establishment for Eastern India.
- Should be supplied complete with accessories including one SS 304 8 valves / ports manifold system, two each 40, 300, 600 and 2000 ml clear flask, angled SS adapters for flask.
- Should have option for Chambers, rack when required.
- The compressor power should be ½ hp or more and should have Vacuum on-off knob on the manifold.
- Should have digital control panel.
- Should have KEYLOCK, DEFROST, VACUUM, TIME function on the display.
- Display read out should be Time, Temperature, Vacuum Pressure etc.
- Operation time: < 23 hr 59 min or continuous operation.
- Option should be there for adding centrifugal concentrator in future
- Instrument should be supplied with a Branded online UPS with 30 min backup.
- Warranty: 3 Years warranty and 2 years AMC after the warranty period.

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Ref. No. 3897(16)/CIF Date: 26.08.2025

Supply and installation of FT-NIR SPECTROMETER

1. The instrument should be capable of performing multi-component analysis, measuring parameters such as Moisture, Protein, Ash, Fibre, Fat, etc.
2. The system should be ready for measuring samples of different matrix like pellets, slurries, liquids, pastes, meals and powder-based food materials, animal feed materials, alcohol.
3. The optical system should be equipped with an internal Gold Coated integrating sphere with Cube Corner mirrors for the measurement of Solid samples in diffuse reflection & Liquid Samples using Transflectance adaptor with a precise path length of 2mm.
4. The sampling area should allow reproducible analysis of inhomogeneous samples or samples with large particle size.
5. Internal, software selectable reference position to enable background measurements without removing samples.

TECHNICAL SPECIFICATIONS

Spectral Range: 11,500cm^{-1} - 4000cm^{-1} (870nm-2500nm)
Resolution: Better than 4cm^{-1} across the full spectral range mentioned above for both reflection and transmission measurement
Wavenumber Reproducibility: Better than 0.04 cm^{-1}
Wavenumber Accuracy: Better than 0.1cm^{-1}
Photometric Accuracy: Better than 0.1% T
Housing: Rugged, compact, sealed, and desiccated optics housing.
Interferometer: Permanently aligned, **Gold coated**, vibration insensitive, high stability to with stand harsh operational conditions also with 10 years warranty
NIR Source: Air cooled Tungsten source, average lifetime 9,000 h, pre-aligned, easily exchangeable by operator
Laser: Diode Laser with minimum 10 years life time or more.
Beamsplitter: Quartz/ CaF2
Detector: InGaAs diode, TE-cooled and temperature-stabilized
Validation: IVU-Internal validation unit for performance qualification (PQ & OQ) Measurement
Device: Horizontal measurement position through quartz window.
Computer: A branded suitable configuration PC along with B/W Laser printer to be quoted.

Software Specifications:

1. The licensed original software with capability for method development should be quoted.
2. Permanent on-line diagnostics, Real time display of instrument status.
3. Software should have functions like, peak picking, band location, Simultaneous evaluation of multiple spectra and have facility to check bands with chemical structure.
4. **Quantification with different calibration models** (linear and polynomial). Lorentzian, Gaussian, and mixed curve shape selection along with self-deconvolution for resolving intrinsically overlapped bands.
5. **Multivariate quantification based on PLS** (Partial Least Squares) calibrations, including optimization tools.

Instrument should be supplied with a Branded online UPS with 30 min backup.
Warranty: The system should come with 3 years warranty and 2 years AMC after the warranty period.

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Ref. No. 3897(17)/CIF **Date: 26.08.2025**

Supply and installation of BIOREACTOR

TECHNICAL SPECIFICATIONS

The fermenter vessel should be cylindrical with curved bottom, should have a working volume of 5L with minimum working volume of 1.0L and total volume of 6.7litre

Glass component should be of high standard borosilicate and the steel component should have SS 316L.

Should have provision of temperature control and it should be by jacketed mode.

The vessel should be fitted with a head plate with ports for acid, alkali, antifoam, feed addition, sparger for air inlet, injection septum ports, sample collection ports, exhaust gas out port with provision of cooling, ports for adopting temperature, pH and DO probes and other tube fittings and baffles.

Head plate should have minimum 14 (or more) no of ports

Should be autoclavable and have provision for lifting and transfer.

Controller should be provided along with the fermenter vessel. The controller should have possibility of measuring and controlling the parameters such as pH, dissolved oxygen, temperature, stirring speed, feed rate, anti-foam, controlling of pump, addition of feed, acid, alkali etc.

Should have provision of cascading RPM, air, oxygen, gas and feed to maintain DO

Should have possibility of user ID, password creation, data storage, export and access, historical trends, data output in graph, Alarms, Recipe creation

Automatic DO control based on aeration, agitation, O_2 supply

A touch screen wireless interface for operation and control of the process using the controller should be available. System must display online overview of all process parameters on the controller screen itself.

System should have option for ethernet connection and should USB, RS 232 interface and should be upgradable to connect one or more external pump

Mass flow controller should be able to control the flow of at least 4 gasses (air, oxygen, nitrogen and CO_2) to be supplied to the reactor

The machine should have direct drive or magnetic drive or both with interchangeable option.

Motor assembly should have provision of clockwise and anticlockwise rotation

Rushton turbine six bladed (2x) impellers should be provided with the vessels with necessary adapters

Agitation speed should be 1-1500 rpm (± 10) or better

Instrument should have four integrated Mass Flow Controllers with gas flow control between 0.1 - 20 LPM and each dedicated for Air, O_2, CO_2 and N_2.

Cascades must be possible for pO2 control and regulated by means of both stirrer speed and gassing rate

At least four inbuilt Peristaltic pumps with variable speed should be provided. All four pumps should be bidirectional, configurable, assignable, and interchangeable

All pumps should be connected to the Microprocessor based control system for batch, fed batch and continuous mode, and have provision to adopt tubing of different sizes

Sterilizable fast response Dissolved Oxygen sensor with cable polarographic sensor

Capable of measuring DO with deviation of ± 2% or better accuracy from actual of set point, having measurement limit of 0-200% or better

Sterilizable pH probe with plug and cable should be supplied

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System should be capable of automatic pH control

PID base control of pH within a pH range of 2-14 or better with limit of set point deviation of ±0.1 or better, should be available with facility of controlling by addition of acid and base

Temperature control should be with RTD, sensor type should be PT1000 or better.

System should have automatic and user defined temperature control mechanism

Measuring range should be 5°C above coolant to 75°C above ambient or better with ±1°C deviation or better.

System should have level and foam sensor, and system should have provision of automatic anti foam addition and level control.

Others Required accessories

System should be supplied with 250 ml sample bottles: 4 no's and Lid holder and DO sensor maintenance kit

Instrument should be supplied with a Branded online UPS with 30 min backup.

Warranty: 3 years warranty plus 2 years of AMC after warranty.

CE certificate should be provided along with the system

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Ref. No. 3897(18)/CIF **Date: 26.08.2025**

Supply and installation of DENATURING GRADIENT GEL ELECTROPHORESIS SET UP

TECHNICAL SPECIFICATIONS

- Denaturing Gradient Gel Electrophoresis System (DGGE), designed for research, education, and process separations, DGGE analysis in microbial community profiling
- **Number of gels**: 1-2 simultaneously
- **Glass plate size**: 200 × 200 mm
- **Usable gel area**: 162 × 175 mm
- **Gel thickness**: 1.0 mm
- **Sample well format**: selectable for 1, 2, 15, 21, or 35 wells (1.0 mm thickness)
- **Buffer volume**: approx. 10 L
- **Circulating pump** ensures buffer uniformity within ±5 °C
- **Height sensor** for buffer protection and automatic shutoff when lid opens
- **Power output** (constant voltage/current or power): up to 600 V / 500 mA / 300 W
- **Features**: Over-voltage and overload auto-detection with alarms, status display, and storage of up to 10 common program protocols, Gradient flow control, automatic shutoff, alarms, memory
- **Timer**: 1 min to 99 hrs 59 min
- **Dimensions**: 458 × 230 × 285 mm
- **Weight**: approx. 23 kg
- **Construction**: Injection-molded, the instrument is flame-retardant and robust with a side-opening safety lid
- Instrument should be supplied with a Branded online UPS with 30 min backup.
- **Warranty**-5 year from date of installation

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Ref. No. 3897(19)/CIF

Date: 26.08.2025

Supply and installation of GEL DOC SYSTEM

TECHNICAL SPECIFICATIONS

1. **Application:** Stain free Imaging, Chemiluminescence, Colorimetry, Fluorescence, Densitometry, Nucleic acid Documentation.
2. **Capable to multiplexing of** Fluorescence (Red, blue and green)
3. High-efficiency charge-coupled and cooled 16-bit CCD camera (-30^{0}C or better), pettier cooling.
4. **Image Resolution (Native):** > 6.0 mega pixel
5. **Pixel density and size**: 65,536 gray levels having individual pixel size at least 4.54 x 4.54 µm or bigger.
6. **Lens aperture:** f/0.70
7. **Read noise:** 5e
8. **Sensitivity:** Minimal dark current with maximum limit of 0.001 e/p/s
9. **Dynamic range**: ≥ 4.8 orders of magnitude
10. **Zoom**: Motorized zoom
11. **Light Source/excitation**: Should include Trans-UV (312 nm), Epi White, trans-white (via White sample tray).
12. It should include following illumination sources such as Epi-blue (440-480 nm excitation), Epi-green (500-550 nm excitation), Epi-red (610-650 nm excitation) and upgrade option for Epi-near IR and Epi-IR for multiplex fluorescence imaging in RGB, Near IR and IR.
13. **Light Emitting Diode: LED**
14. **Blot/UV/Stain-**Free Sample Tray for trans ultraviolet, such as stainfree, ethidium bromide, SYBR® Green, SYBR® Safe, SYBR® Gold, GelGreen, GelRed, fluorescein, Oli Green, Oriole, SYPRO Ruby, SYTO 60, Coomassie Blue, Alexa Fluor (488, 546, 647, 680, 790), DyLight (488, 550, 650, 680, 800), IRDye (680RD, 800CW), and StarBright Blue (520, 700).
15. **White Sample Tray** for trans-white illumination; use with colorimetric stains, such as Coomassie and silver stains
16. **Safety features**: Instrument should have provision for protective UV shield for use during band excision with safety interlocks to avoid un-intentional UV exposure to the user.
17. **Image capturing technology:** Flat field for viewing image as total clarity
18. **Imaging area**: 22 cm (width) x 26 cm (height) or larger
19. **Free Software-**Image capturing, processing, hardware calibration, image optimization, image assessment, band distance measurement, Optical density, Colony counting, etc. and export of data. Software should be upgradable.
20. **Image format:** 16-bit TIFF, BMP, JPEG, etc.
21. **Compactible Computer from branded company:** For storage, and analysis of data. SDR: 512 or more, RAM-8GB or more, Processor-Intel i5 or better, Windows 10 or more, Keyboard, mouse, monitor, antivirus
22. **Warranty:** 2 years warranty and 3 years of AMC after warranty
23. Instrument should be supplied with a Branded online UPS with 30 min backup.
24. **Should provide original brochure, should match web site.**
25. **Accessories: Should provide for function of equipment if not mentioned.**

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Ref. No. 3897(20)/CIF **Date: 26.08.2025**

Supply and installation of 2D-ELECTROPHORESIS SYSTEM WITH POWER SUPPLY

TECHNICAL SPECIFICATIONS

1. 2-D Electrophoresis system for second dimension protocols of 2-D electrophoresis, SDS and agarose gels and native PAGE Electrophoresis.
2. Optimal device for a large number of samples that need extended separation and mobility shift assays
3. Casts and runs one or two 20 x 20cm gels in the upper buffer chamber
4. Larger size cassette to give the maximum number of samples and separation length
5. Central cooling core to provide even cooling across the gel surface for outstanding resolution and clear banding
6. Cooling needs to be achieved by circulating fluid through the core with external circulator or cool tap water
7. Very simple clamping mechanism makes loading glass cassettes and most manufacturers' precast gels trouble free
8. It should include 4 Blank Glass Plates and 4 Notched Glass Plates.
9. 4 Combs: (2) 15 Well and (2) 20 Well, 1.5mm Thick, 4 Spacer Sets: 1.5mm Thick,
10. Should include Blocking Plate for Single Gel Operation, and Spacer Placer
11. Include Upper Buffer Chamber with Internal Cooling Core, Lower Buffer Chamber, Super Safe Lid with Attached Power Supply Leads.
12. Gel Size (L x W) | 20×20cm
13. Footprint (L x W x H) 30.5 x 16.5 x 23cm (12 x6.5 x9in)
14. Total running buffer volume 1250mL
15. Should have CE certificate
16. Instrument should be supplied with a Branded online UPS with 30 min backup.
17. 5 years full replacement warranty

Specification of POWER Supply

1. Output voltage 3000V, Max Current 400mA.
2. Total no of jacks 4
3. Digital display of voltage and current
4. Timer 0-99 hr. to 50 min.
5. (L×W×H) 31×27×13.3cm, 12×10.75×5.25 in.
6. Power-off memory to retain settings after shut-down
7. System should offer constant power mode
8. Soft touch keypad allows for quick set-up
9. Five Year full replacement warranty

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Ref. No. 3897(21)/CIF

Date: 26.08.2025

Supply and installation of HIGH SPEED REFRIGERATED CENTRIFUGE

TECHNICAL SPECIFICATIONS

1. Max. Speed: 24,000 rpm or more
2. Max. RCF: 68,900 x g or more
3. Max. Rotor Capacity: up to 4 Litre or More
4. Control: Touch-screen interface (can be used with gloved hand)
5. Drive System: brushless, high-frequency, direct drive with 3-year non-prorated warranty
6. Temp. Set Range: -10° C to 40° C
7. Refrigeration system: CFC, HCFC & Florine free with 5-year non-prorated warranty
8. Run Time: 99hrs; Hold
9. Temp. Control Accuracy: ± 2°C of set temperature
10. Speed control range: Minimum 500 rpm, Maximum 24,000 rpm
11. Speed Control Accuracy: ± 25 rpm
12. Programmability: 99 programs or more, 99 hours 59 min 59 sec, HOLD
13. Must have "at-start" and "at-speed" options.
14. Acceleration/ Deceleration Profile: 9 Accel, 10 Decel, with brake off option.
15. Power: 200-240 VAC, 50 Hz, 30 A, single phase
16. The centrifuge must provide automatic and instant rotor identification, completed upon installation of the rotor into the centrifuge, before the run is started
17. System must be able to setup Step run, 30 profile/speed/time triplets, up to 3 steps each.
18. The onboard free software must be able to provide operator log.
19. Fast, simple, and secure push-button rotor exchange mechanism to automatically lock the rotor onto the drive adapter, eliminating the need for a tool or to hand tighten.
20. The centrifuge must have an energy savings mode ("sleep mode") to reduce power consumption up by turning itself off if idle after a period of time.
21. User access control with optional password protection for multi-user environments.
22. Noise must be less than 60dBA & heat output must be less than 3.5 kW
23. The centrifuge must be able to satisfy cULus, IEC 61010, ROHS, WEE and CE safety requirements without being bolted to the floor, to provide flexibility to relocate within the facility.
24. The refrigerant should be free from any Florine component as per the environment protocol and notification.
25. The centrifuge must be quoted along with the following rotors:

a) Fixed Angle rotor: 8 x 50 mL with max rpm 24,000 & Max RCF 68,900 x g or more Rotors must be quoted with lid, extra O-rings & one complete set of 8 no. PPCO bottles with closures. Need to provide 4 numbers of adaptor for15 ml conical tube for this rotor, 8 numbers of adaptor for1.5 ml conical tube for this rotor & 200 numbers of 1.5 ml Conical Microtube.
All the tube & adaptor must sustain the g force of 68,000xg.

26. The equipment should be well established in the market with installation and not a customized one, need to submit 5 government PO copies, CE certificates & 5 user satisfaction letters & may need to provide demo. Need to supply 1 no 5 KVA voltage stabilizer.
27. Warranty: 5 yrs on the total System.

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Ref. No. 3897(22)/CIF **Date: 26.08.2025**

Supply and installation of MONOCHROMATIC PLATE READER

TECHNICAL SPECIFICATIONS

- Instrument should be able to read monocromator based UV-Vis Absorbance, Fluorescence and Luminescence as well as Time-Resolved Fluorescence (2°mode).
- Should be capable of performing Endpoint, Kinetic, and Spectral Scanning and Well area scanning assays. All modes should be fully automated.
- It should be able to read 6, 12, 24, 48, 96, 384 well plates without need for any adapters. Also read Micro-volume (2µl) samples at least 16 samples at a time. Also, should be capable of measuring standard cuvettes.
- It should have Linear, Orbital and double shaking feature with 4- zone temperature control facility from ambient +4°C to 45°C with condensation control mode. Option for speed and duration should be programmable.
- Wavelength selection with Quadruple grating Monochromator (2 Excitation and 2 Emission Monochromators)
- Absorbance wavelength range should be selectable from 250 to 999nm selectable in 1 nm increments. Fluorescence wavelength should be selectable from 250 to 850 nm selectable in 1nm increments. Luminescence wavelength - 300 - 700 nm
- Light source should be Xenon Lamp having long life with at least 1 billion flashes
- Detector - Photodiode for Absorbance and PMT for Fluorescence and Luminescence
- Absorbance range should be from 0 to 4 OD with resolution of 0.0001 OD
- Should have pathlength correction feature.
- It should have both Top and Bottom reading probes for Fluorescence measurements
- Fluorescence Sensitivity: Fluorescein 2.5 pM (0.25 fmol/well 384 well plate)
- Time-Resolved Fluorescence (2^{O}mode):
  Light source: Xenon Flash Lamp, Wavelength Range: 250 - 850 nm
  Wavelength selection: Deep blocking band pass dichroic mirrors.
- It should be capable of performing glow Luminescence assay.
- Luminescence sensitivity: 20 amol ATP, Reading speed - 96 wells -11 sec & 384 wells- in 22 sec
- Instrument should be CE and TUV Safety Agency marked and RoHS compliant
- Option for upgradeable on site to include Anisotropy integrated in the same unit for future needs. Also, should be able to onsite add dual reagent dispenser for fast kinetics and flash fluorescence/Luminescence assays. Option for Upgradeable on site to CO_2/O_2 Gas Control System & Fluorescence Polarization also.
- Automated Path length correction facility and automatic software for data reduction and calculation should be available
- Suitable software to perform data analysis and data acquisition
- 100-240 VAC 50/60 Hz .130 Watts max
- Warranty 04 Years on Machine plus 1 yr AMC after warranty.
- Computer: Branded Desktop computer with i3 processor 4 GB RAM, 1TB HD, Windows 10 Pro with 19-21-inch monitor should be provide with the machine
- All spare parts should be available in next 10 years from the date of supply.
- Instrument should be supplied with a Branded online UPS with 30 min backup.

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Ref. No. 3897(23)/CIF **Date: 26.08.2025**

Supply and installation of FLUORESCENCE SPECTROPHOTOMETER

TECHNICAL SPECIFICATIONS

Wavelength range	: 200 – 900 nm (for both excitation as well as emission)
Spectral bandwidth	: Excitation side : 1, 2.5, 5, 10, 20 nm Emission side : 1, 2.5, 5, 10, 20 nm
Wavelength accuracy	: Within ±1.5 nm
Wavelength repeatability	: 0.2 nm
Wavelength readability	: 0.1 nm
Detector	: R 928F Photomultiplier tube (PMT) (Standard);
Light source	: 150 W ozone free Xe lamp
Wavelength Scan speed	: 30, 60, 240,1200, 2400,12000, 30000,60000 nm/min
Monochromator	: Stigmatic concave diffraction grating
Sensitivity [BG]	: S/N 15000 or more (RMS) or more upon measuring Raman spectrum of water, EX wavelength: 350 nm, Slit (both EX and EM): 10 nm, Response: 4 s
Minimum sample volume	: 0.6 ml (with standard 10 mm rectangular cell)
Photometric Principle	: Monochromatic light monitoring ratio calculation
Resolution	: 1.0 nm
Wavelength drive speed	: 60000 nm/min
Response	: Response from 0 to 98%, Selectable from 0.002 ,0.004, 0.01, 0.05, 0.1, 0.5, 2, 4 & 8 sec and auto
Photometric value range	: -9999 to +9999
Data processing unit	: PC
Interface	: USB interface for communication with the computer.
Standard Software	: Windows 7 based FL Solutions Program for controlling the instrument and its accessories. Data processing features such as quantitative analysis, wavelength scan measurement, time-based measurement such as phosphorescence life time, 3-D measurements, Data export to Microsoft Excel, Print preview etc. Provision for quantum yield

Main unit supplied complete with: (one quantity each)

150W Xe lamp, Cell for Fluorescence, 10 mm pathlength, Light Diffuser, Triangular cell with metal fittings, Filter Holder, Tools (screw driver etc). Power cord, Instruction manual (Maintenance manual), Instruction manual (Operation manual), FL Solutions Program (CD-R), USB Cable (1.5m)

POLARIZATION ACCESSORIES UV-VIS: Wavelength range 260 to 700 nm
THERMOSTATTED CELL HOLDER (Chiller required): Temperature range 5°C to 60°C
SUITABLE REFRIGERATED WATER BATH CIRCULATOR:
Temperature: 10 °C to 80°C, Capacity: 5 Liter.
Branded Computer
Instrument should be supplied with a Branded online UPS with 30 min backup.
Warranty : ONE YEAR Warranty and Four Years AMC

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Ref. No. 3897(24)/CIF

Date: 26.08.2025

Supply and installation of FUME HOOD

TECHNICAL SPECIFICATIONS

Dimension	5'0"L x 2'5"W x 7'9"H in feet
Material of Construction: **a) Carcass**	16mm thick melamine resin filled laminated flat press board, sealed by PVC edge tapes.
b) Shutters	The shutters and drawers fronts will have chemical resistant **PVC thermo foil** face **E1/E2** grade core material the urethane acrylic coating on top of thermo foil is resistant to deformation and scratches PVC.
Door	Single, vertical sliding, concealed type door, balanced with counter weights and wire rope etc.
Ducting	Rigid ducting of FRP of 200 mm dia. 10 feet 4 mm thick rigid FRP pipe will be provided with suitable rain-hood.
Baffle	A stable, non-adjustable with a single slot on the back baffle to aid in distributing the flow of air into and through the hood. The baffle shall be spaced out from the back liner and shall be removable for cleaning.
Impeller	Dynamically balanced impeller
Baffled by	3 MM thick sheet
Centrifugal Blower	Silent high efficiency remote blower consisting of continuous rating motor and chemical resistant impeller. The blower is designed to give a face velocity at safe working height as per the international safe velocity norms. The exported face velocity at open sash is 100 FPM.
Casing	6MM thick Resin.
Coupling	Direct
Sash	The sash shall be of glass with vertical rising frame. The bottom of the sash frame shall have a full length handle. The sash be counter balanced with a weights to prevent titling and binding during operation. The glass panel shall be 5mm toughened glass.
Bottom Arrangements **a) Carcass**	16mm thick melamine resin filled laminated flat press board, sealed by PVC edge tapes.
b) Shutters	The shutters and drawers fronts will have chemical resistant
Suction Expected	800-1000 cfm
Colour	**Any (Preferably Blue & White Combination)**

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Flooring	The work top should be made of intense chemical resistant 25 microns thick **FEP** (Fluorinated Ethylene Propylene) Supported on a backing material of 16 mm thickness with a pressure sensitive acrylic adhesive that adheres to most surfaces. Skirting of 15mm thick granite on 3 sides should be provided.
Lighting	1 No. 4 feet **Tube light** of 20 volts will be provided.
Electrical Arrangements	The hood super structure shall be fully wired. It also has **6 No's**. Electrical sockets and switches of (230V, 5/15A, 50HZ)
Cable Entering port	For easy access of cable of from fume hood to electrical sockets.
Sink & Water tap	1 No of **FRP Sink** (12"x10") with single way water tap will be provided.
Gas Valve	**2 No's** of **Gas valve** will be provided.
Vacuum Valve	1 No of **Vacuum valve** will be provided

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Supply and installation of DIFFERENTIAL SCANNING CALORIMETER (DSC)

TECHNICAL SPECIFICATIONS

The highly sensitive differential scanning calorimeter should have capability of improved quantitative compositional analysis through sophisticated mathematical algorithms.
Data Simulation capability: The data should be simulated with the measurement under different scan rate from very slow heating rates such as 0.001°C/min to very fast heating rates such as 100,000°C/min

- **DSC Type**: Stand-alone (independently running) Heat flux type
- **Furnace design**: The DSC cell should have the furnace constructed of silver
- **Sensor material**: Constantan with gold covered.
- **Temperature range**: RT to 700°C (Continuous) or more. The system should work for the entire range without removal of cooling head.
- **Electrical Chilling Unit from** – 80 degrees to 500 degrees C.
- **Sensitivity**: 0.2µW above the noise level for the entire range from RT to 725°C
- **Dynamic measurement range**: + 350 mW
- **Temperature Precision**: +/-0.01°C
- **Temperature Accuracy:** +/-0.05°C
- **Temperature Reproducibility**: better than 0.1°C
- **Scan rate**: 0.01°C to 100 °C/min with secure and controlled purge arrangement
- **DSC Time constant:** Less than 3 (s)
- **Calorimetric Accuracy**: 0.4%
- **Calorimetric Precision**: **0.05%**
- **Atmosphere**: Should be static (or) dynamic, including nitrogen,argon,helium,air,oxygen and other inert gases
- **Gas flow control:** Digital mass flow controller which is calibrated for all noble gases
- **RMS Noise**: 0.1µW. RMS noise should be related to both signal and noise power (or amplitude) which is measured at the same or equivalent points in a system, and within the same system bandwidth.
- **Local module**: Control unit should have LCD display of weight, temperature and experiment status
- **Upgradable Sample Observation Feature:** Unit Real View upgradable option in future based on application requirement should be there.

- **Software**: Windows-based Thermal Analysis software for data collection and treatments. Multitasking and multimodules software exploitation license under Windows for data acquisition and storage, Drawing and printing of the DSC, DDSC and DTA curves according to time or temperature, calculation and printing of derivatives curves, mass variation calculation, regression calculation, data storage, baseline correction, DSC peak integration, multi task software under Windows. Should have capability of converting collected data into ASCII after finishing the test for exportation. Should include special Softwares like curve treatment (smoothing, deconvolution, erasing, slope adjustment...), Kinetics for DSC, DTA, Purity, heat capacity software. The high sensitive differential scanning calorimeter should have capability of improved quantitative compositional analysis through sophisticated mathematical algorithms. The data should be simulated with the measurement under different scan rate from very slow heating rates such as 0.001°C/min to very fast heating rates such as 100,000°C/min

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- **Crucibles**: Aluminium (2000 Nos.), Alumina (40 Nos.) and Platinum (10 Nos.), Stainless steel (10 Nos)
- **Spares and consumables**: List of Spares/Consumables should be provided.
- **Calibration Standards**: DSC system should have facility for flexible calibration that is saving calibration with multiple combination of gas type, flow rate, crucible type etc. NIST Certified calibration standards for temperature, heatflux and heat capacity measurements should be quoted along with the system. Minimum five-point calibration standards.
- Gas cylinders with regulators: Suitable gas cylinders of N2 and O2/Air gases of IOLAR grade II quality with dualstage gas regulator, Moisture traps need to be provided by vendor at the time of installation.
- PC Printer, and UPS: All installation utilities like desktop PC, Printer, Online UPS 5KVA with 30 minutes backup time should be provided.

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Supply and installation of LCR SETUP WITH TEMPERATURE VARIATION (AUTOMATIC)

TECHNICAL SPECIFICATIONS

- VNA a bidirectional 2-port test set, to measure all S-Parameters on passive components.
- large touch screen displays for clear view of readings and parameters.
- Built in Help: context sensitive help menu for quick help.
- The VNA must be easy to calibrate with calibration wizard.
- Standalone VNA, must not be dependent on an external PC, mouse or keyboard to use VNA.
- Solid performance: For stable and repeatable measurements, with better trace noise is important for the VNA parameter.

Sl. No.	Parameter	Tender Specification
1.	Frequency	5KHz to 20 GHz Benchtop Only
2.	No. of Ports	2
3.	Impedance	50 Ω
4.	Resolution	1Hz
5.	Port O/P range	-10dbm to 0 dBm or better
6.	Measurement Bandwidth	10 Hz to 500 kHz or better
7.	Directivity	≥ 35 dB
8.	Source match	≥ 30 dB
9.	Load match	≥ 35 dB
10.	Dynamic Range	@12 GHz > 105 dB Or better @20GHz >100 dB or better
11.	Trace noise magnitude (RMS) from 8GHz to 12GHz	< 0.005 dB, or better
12.	Measurement Parameters / Formats	Full S-Parameter test set for bidirectional measurements on passive components, Smith Chart.
13.	Measurement Functions	Measurement Wizard, De/embedding functionality and fixture compensation
14.	Measurement points per trace	1,00,000 or better
15.	Damage Level	+27 dBm or better
16.	Built In Display	Built In (10") diagonal WXGA color LCD with touchscreen.
17.	Save/Recall & Limit Lines Facility	Required
18.	Interface	LAN, USB
19.	Test Cables	2 Nos Must be supplied N to SMA type with suitable connectors.
20.	Waveguide	WR 90 and other waveguide covering upto 20GHz Bandwidth with suitable RF connector attachment. with • Flush Short, Offset Short, Match, • Straight Line (2 nos), • Sample holder • 1/4λ, 1/8λ, 3/8λ section or other value • Custom Length / Waveguide Horn

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		• NRW measurement file with analysis display feature.
21.	Warranty	5 Years
22.	Future Upgradable feature	Must support Solid, Liquid and semi solid sample material measurement. Instrument Must be future upgradable to 20+GHz of built in spectrum analyzer.
23.	UPS	Instrument should be supplied with a Branded online UPS with 30 min backup.

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Ref. No. 3897(27)/CIF **Date: 26.08.2025**

Supply and installation of qRT-PCR

TECHNICAL SPECIFICATIONS

1. System should run real-time PCR experiments without being attached to a computer. When operated as a stand-alone instrument, the instrument will save at least 1000 run files.
2. Real-time data traces can be viewed during a run from the thermal cycler screen.
3. System includes an automated lid that opens, closes, and can apply sealing force to reaction wells.
4. System must not have lid or drawer that extends beyond the footprint of the system nor requires additional operating clearance.
5. System can detect a 1.3-fold change in gene expression.
6. Thermal gradient for optimization of multiple temperatures in a single assay. Temperature differences of up to 24°C front-to-back can be created.
7. Peltier-driven thermal cycler with maximum ramping speed of 5°C/sec, with an average ramp rate of 3.3°C/sec.
8. Should have a thermal block operational range of 4–100°C.
9. Sample block temperature accuracy is +/-0.2°C of programmed target at 90°C, with a uniformity of +/-0.3°C well-to-well within 10 seconds of arrival at 90°C.
10. Optical system allows excitation and detection of up to five fluorescent dyes in a single reaction well.
11. Optics independently illuminates and detects fluorescence from each well with the same LED/detector pair per channel. The system should have six filtered LEDs for illumination and differentially detects emission using six filtered photodiodes (one for each channel plus FRET).
12. System must have fixed optical path, directly over each well, eliminates the need to normalize for positional bias.
13. Absorption spectra in the 450–684 nm; Emission spectra in the 515–730 nm range.
14. One channel is dedicated for FRET and Protein Thermal Shift (Protein Melt) experiments.
15. System should read all 96 wells with all channels within 12 seconds.
16. In "SYBR/FAM" scan mode, the system should read all 96 wells within 3 seconds.
17. Dynamic range of 10 orders of magnitude.
18. Should detects one copy of target sequence in human genomic DNA.
19. Reaction volumes from 1–50 µl.
20. Should detects ≤10 fmol of fluorescein.
21. System can be integrated with an automation system for hands-free operation.
22. System should continue to run and complete a run if the software is stopped or interrupted to prevent run data from being list in case if there is unintentional interruption of the software. This function is especially valuable for precious or limited samples, whereby all data is not lost for a run that was interrupted.
23. System should directly connect to a network file storage location through Wi-Fi or ethernet with user credentials and can read and write, given system access rights.
24. System should connect to cloud platform for remote monitoring, experiment set up, and Cq analysis.

Software specifications:

1. Multiplex amplification and melt curve and end-point analyses should be performed on up to five fluorophores in a single reaction well. Multiple plates should be combined into one experiment with the Gene Study Feature.
2. Run results should be displayed in a customizable configuration so that multiple panes of information can be viewed in a single window. Multiple standard curves should be simultaneously viewed when a common fluorophore is used for multiple targets.

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3. PCR quantification by standard curve features automated calculations of reaction efficiencies with y-intercept. Automated allelic discrimination by end-point fluorescence or quantification cycle (Cq) values.
4. Gene expression analysis by relative quantity (ΔCq) or normalized expression (ΔΔCq). Multiple reference genes Could be assigned in normalized expression (ΔΔCq) analysis. Software should have reference Gene Selector Tool displays gene stability for selection of ideal reference genes.
5. Up to 5,000 Cq values from different data files should be compared for gene expression analysis. Embedded reports tool should be customizable by the user to export run information, data tables, graphs, and analysis parameters in a specified order to PDF or other file formats.
6. Software should be laboratory information management system (LIMS) enabled. Software should be able to data to be grouped and interpret by both technical replicates and biological groups.
7. Image export options must include DPI selection up too 600DPI, choice of any image size, and color selection using RGB specifications. Image annotation function allow for automatic p-value annotation and addition of arrows, circles, and text directly onto graph images.
8. Software should performs t-tests and 1-way ANOVA calculations. Software should display data in multiple formats including bar chart, dot plot, box-and-whisker plot, scatter plot, clustergram, and volcano plot. Should control up to 4 Instruments with one PC.

Instrument should be supplied with a Branded online UPS with 30 min backup.

Warranty: Five years from the date of installation.

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Ref. No. 3897(28)/CIF **Date: 26.08.2025**

Supply and installation of DEEP FRIDGER (-80 °C)

TECHNICAL SPECIFICATIONS

1) The Freezer shall have minimum inside volume capacity of more than 545 Liter.
   The Freezer shall maintain a sample temperature -50°C from -80°C with 1°C increment in an ambient up to 320C temperature with PT1000 sensor and total 3 sensor controlling system.
2) The freezer must be constructed using 1" thick vacuum panel insulation in conjunction with environmentally friendly water blown foam.
3) The interior of the freezer should be corrosion resistance steel interior and exterior should be powder painted.
4) Door latch allows one-handed opening and closing. Handle must include door key lock as well as padlock provision for added security.
5) Freezer shall have 4 or more internal storage compartments with a minimum of 4 insulated inner doors to ensure sample security.
6) Freezer shall have an automatic heated pressure equalization port which allows for rapid re-entry to cabinet.
7) Freezer shall have two-1inch access ports as standard.
8) Freezer shall have a RS485 output, dry contacts and 4-20mA output for remote monitoring purposes & Provision for set up connection for sending alarm & alert to the user over Mail /SMS.
9) Freezer must have capability of being cloud connected for remote system monitoring.
10) Freezer must incorporate with Touch Screen Controller Display panel.
11) Freezer shall incorporate set point security with passcode/password.
12) Freezer interface shall incorporate icons to advise users of alarm status for warm or cold excursions, door ajar, or power failure.
13) Freezer interface shall have warm alarm test function.
14) Freezer interface shall have a health status icon to understand the condition of the freezer at a glance.
15) Freezer shall record temperature excursions including actual temperature, warmest temperature, and coldest temperature along with 5 sensor data.
16) Freezer must recognize if line voltage and frequency does not match freezer specification and alert user.
17) Freezer must work on line voltage of 230V/ 50Hz and have an instrument current rating of no more than 6.3 Amps.
18) Freezer shall control temperature to within an average peak variation from set point of +6/-3.5 at a -80C set point in an empty freezer of 230V/50Hz voltage supply. Supplier must provide test data to verify freezer performance.
19) Empty freezer shall recover from one minute door opening to -75°C set point in under 18 minutes in an ambient temperature of 20 °C. Supplier must provide test data verify freezer performance.
20) Empty freezer should not warm to -50°C from -80°C set point in under 4 Hours during a power failure in a 20°C room. Supplier must provide test data verify freezer performance.
21) Freezers must maintain a sound level no louder than: 52Db(A).
22) Freezer shall use only natural, commercially available refrigerants (Natural refrigerants compliant with EU F-Gas regulation: ONLY flammable Hydrocarbon without fluorine). Need to provide refrigerant details.
23) The refrigeration system should be two Stage Cascade System.
24) The Condenser of the system should be Enhanced Micro-Channel and Forced-Air Cooled for better performance.

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25) Freezer must be built to and contain the registration mark for UL, cUL, and CE/BIS standards for safety and performance.
26) **The freezer should have onsite 5-year standard warranty on all parts.**
27) The freezer should come with a proper voltage stabilizer with 5 years of warranty.
28) Need to provide globally available published in OEM website Catalogue & printed document to establishing the above specification & need to provide demo to establish the above specification. The equipment should not be a customized one & well established in the market with performance with physical demonstration of all the above specification.
29) Need to provide 3 order copies & appreciation letter from reputed government customer & if require need to provide demo of the equipment.

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Ref. No. 3897(29)/CIF **Date: 26.08.2025**

Supply and installation of KBr HYDRAULIC PRESS ALONG WITH DIE

TECHNICAL SPECIFICATIONS

- Max pressure 15 tons
- Acrylic screen should be provided for safety of operation (Along with Oil Bottle)
- Study leak-proof design
- A telescopic handle is used for extra leverage
- Compact pressure ram barrel assembly inside oil tank hence leak-proof assembly
- Calibrated pressure gauge
- Long release lever to obtain controlled slow release.
- Barrel Size 85 mm x 32 HEX (Bore Size 13 mm)
- Ram 13 inches and length 132 mm
- Working length 98 mm
- Over all dimensions 230 x 180 x 350 mm
- Net Weight- 30 Kg
- KBr Die punch- 10mm (Max. Load-6 ton) : (3 sets)
- KBr Die punch- 12mm (Max. Load-8 ton) : (2 sets)
- Additional two bottle of hydraulic oil to be provided.

- Warranty: One year from the date of installation.

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Ref. No. 3897(30)/CIF **Date: 26.08.2025**

Supply and installation of TABLE TOP CENTRIFUGE-I

TECHNICAL SPECIFICATIONS

- Maximum Speed: 15,000 RPM with 8x15 ml tubes and 10,000 RPM with 8x50 ml tubes
- Maximum RCF: 5250g
- Digital timer range: 0-99min, Noise: ≤60dB,
- Dimensions: 390 x470 x 290mm (W x D X H)
- Power: 220-240 V AC, 50 Hz
- Automatic Rotor identification
- Alphanumeric LCD display of speed and RCF
- Selection of 3 acceleration & de-acceleration profiles.
- Includes angle rotor for 8 tubes of 15 ml & angle rotor for 8 tubes for 50 ml
- Warranty: 5 years warranty

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Ref. No. 3897(31)/CIF **Date: 26.08.2025**

Supply and installation of TABLE TOP CENTRIFUGE-II

TECHNICAL SPECIFICATIONS

- Maximum Speed: 17300 RPM with an angular rotor of 24 tubes of 1.5 ml
- Maximum RCF: 27440g
- Digital timer range: 0-99min, Noise: ≤60dB,
- Dimensions: 400 x500 x 455mm (W x D X H)
- Power: 220-240 V AC, 50 Hz, Single Phase
- Dynamic brake with imbalance detector and cut-off
- Digital speed indicator with safety lid interlock to prevent cover opening during centrifugation.
- Includes angular rotor for 24 tubes of 1.5ml
- Warranty: 5 years warranty

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Ref. No. 3897(32)/CIF **Date: 26.08.2025**

Supply and installation of HOT AIR OVEN (Minimum 300 °C)

TECHNICAL SPECIFICATIONS

1. Chamber Volume: Should be 95 Litres or more.
2. Footprint should not exceed: 4 Squier feet for 95 litres unit.
3. The ovens should have gravity convection & mechanical convection both.
4. Temperature Range 50° C to 330° C
5. Spatial Temperature Deviation at 150°C: and ±1.3 °C for 95 litres units.
6. Temperature Deviation over Time at 150°C: ±0.2 °C
7. The Inner chamber should be made of AISI 304 / 1.4301 Stainless Steel
8. The Ovens should have an automatic over temperature alarm
9. The ovens interior should have rounded corner for ease of clean and better contamination control
10. The system should have shelving system that can be fitted inside the chamber with just one click
11. The ovens interface should be microprocessor controlled and should be a vacuum fluorescent display with touch button control.
12. The controller should be programmable for temperature ramps and dwells with up to 10 programs with 10 discrete steps
13. The oven should be provided with 2 shelves as standard and should be capable of accommodating a maximum of 16 shelves.
14. Each of the shelves should be capable of accommodating a load of 25 Kg
15. An option for sample temperature sensor should be there with the system Auto-dry function deactivates oven when the samples are dry.
16. The oven should have an electronically controlled damper opening for venting out the chamber air & 5 step fan speed controller.
17. The ovens should be covered with 2 years of warranty and 3 years AMC after warranty
18. The oven should have RS 232 interface providing data logging capability
19. The ovens should be stackable with optionally available stacking kit
20. The ovens should have the choice of daily / weekly on/off timer with choice of real time clock or hours of operation display.
21. The door should be able to open at 180° angle for complete access to chamber interior.
22. The ovens should be provided with an access port for independent monitoring of sample temperature
23. The ovens should have a boost function for rapid heat up of chamber interior
24. The oven should have dry alarm contact to connection of alarm device
25. The ovens should be able to operate at 230 V/50 Hz
26. The product should have CE / BIS certificate for safety purpose.
27. Need to provide proper voltage stabilizer with each oven.
28. The catalogue & technical details should be available in the OEM website for verification all the above specification. Need to provide document & if require demo to confirm all the above specification.

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Ref. No. 3897(33)/CIF **Date: 26.08.2025**

Supply and installation of WEIGHING BALANCE

TECHNICAL SPECIFICATIONS

Display	LED Touch screen with optimized for users in laboratories
Calibration	Internal calibration isoCAL, External calibration
Special built-in lab applications	Mixing Net Total, Components Totalizing, Statistics, Weighing Dosing, Density, Percentage weighing, Check weighing, Peak Hold, Counting, Unstable Conditions, Mass Unit conversion, Calculation Free Factor Animal Weighing
Protection	Chemical resistant finish of the housing
Assures SOP	With Self notification if the calibration is outside the normal range
Password protection	Single Level password protection
Anti-theft lock	Kensington lock and lockdown capability for cable or chain
ID creation	Sample ID and Batch ID creation possible
Protection	Chemical resistant finish of the top housing Glass parts of the draft shield are coated to reduce electrostatic influences In-use cover Dust cover for balances with draft shield
Interface	Future Proof USB type C interface, Industry Proof RS232 9-pin interface Backward Compatibility (by Using RS232 port)
Data Transfer	Direct data transfer to Microsoft® Windows programs
Weighing Pan	Best Repeatability with rectangular weighing pan
Draft Shield	Can be removed completely
Language	Built in language: English
Weighing System & Technology	EMC, Monolithic
Weighing Capacity	220 gm
Readability	0.1 mg
Repeatability	0.08 mg
Linearity	0.06 mg
Typical stabilization time	≤ 1.5 sec
Typical Measurement Time	≤ 2 sec
Weighing Chamber Height	240 mm
Weighing pan size	90 mm
Warranty	5 years warranty

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Ref. No. 3897(34)/CIF **Date: 26.08.2025**

Supply and installation of ORE MICROSCOPE

TECHNICAL SPECIFICATIONS

Item	Description
Microscope Body/Frame	Polarising Microscope for reflected light (RL) and Transmitted light (TL) illumination
Stand &Nosepiece	Stand with Encoded 5-position or more with all position centerable nosepiece for all the objectives with slot for nosepiece compensator.
Focus	3-gear focus drive (coarse / medium / fine) with 1- and 4-micron torque adjustment, and adjustable upper focus stop Self-adjusting focus mechanism
Phototube	Beam splitting for simultaneous observation through eyepieces and live display of image on screen. Trinocular observation tube with inclination 30 degree Interpupillary distance should be adjustable maximum up to 75mm
Objectives	Strain free PLAN Achromatic Laser engraved POL objective. 2.5x/0.07 Free Working Distance 11 mm or more 5x/0.12 Free Working Distance 14 mm or more 10x/0.25 Free Working Distance 17 mm or more 20x/0.40 Free Working Distance 1 mm or more 40x/0.65 Free Working Distance 0.30 mm or more 50X objective should be Oil Immersion for Coal Application Objective should be compatible for Transmitted (Thin section) and reflected light illumination (Ore Petrology)
Eye Piece	Eye piece wide field 10X/22 mm FOV with locking screw on left eye tube and cross hair graticule Eye pieces should be suitable for observation with and without eyeglasses
Illumination	Reflected encoded polarisation illuminator light illuminator with built in adjustable aperture diaphragm produce bright, crisp and maintenance free lighting for all samples. Oblique illumination / DIC for incident light observation for better observation of surface relief. Hi- Power Constant colour 15 W LED (4500K) with intensity control facility. Reflected light illuminator incorporates Manual Coded 4-fold turret, color-coded diaphragm assistant (CDA) Reflected Axis should contain built-in quartz plate to avoid pseudo-pleochroism Centerable aperture and field diaphragm
Condenser	Pol Achromatic-Aplanatic condenser (A 0.9) with switchable Condenser head Colour coding for fast and easy adjustment of the aperture diaphragm
Analyzer and Polarizer	Analyser rotatable 180° with Scale of 5^0 vernier Transmitted light polarizer should be rotatable/swing-out/In-mount type. Reflected light Polarizer should be plugged into 3 different click stops 0° (east-west), 45° (diagonal), 90° (north-south)
Conoscopy and Compensators	Centerable / Focusable Bertrand Lens for Conoscopic application Whole-wave plate in compensator slot (Gypsum Plate) Quarter Lambda plate in compensator slot (Mica Plate)
Stage	Pol rotating stage, with ball bearing, rotation clampable, Diameter 177 mm or more, with 2 verniers 0.1^0 with stage bracket and condenser holder.

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	Advanced Object guide for Pol-Stages with ultra fine xy-control, suitable for different slide formats, including interchangeable resting buttons (0.1, 0.3, 0.4, 1.0 and 2.0 mm) for point counting, scanning area approximate. 30 x 40 mm with 2 vernier 0.1 mm.
Camera & Software	CMOS/CCD Sensor, minimum 6 megapixel Fast Camera frame rate maximum up to 15 fps or more Dynamic range 70 dB or more 3 x 12-bit = 36-bit RGB IR Cut off filter is must. Passive Cooling is must. Full well capacity: 12000e or more Exposure time: 1 ms – 1 s or better Suitable C-mount for optimal acquisition condition Connection: USB 3 or better Software for basic measurement, calibrated measurement parameters such as length (Point to Point), Basic image processing tools (crop, resize, sharpening, colour adjustment, background filter, median, blur). Visual Comparison view. The software should have stitching function merges multiple live images into a mosaic image using a manual stage Microscope, Camera, and software shall be from the same / single manufacturer for better synchronization.
Dust Cover	One Antistatic Dust Cover should be supplied for the protection of the microscope.
Computer & Other Accessories	Latest brand computer system with i7 processor, 32 GB RAM, 2 TB SSD, 2 GB Graphics, Monitor 32-inch or more full HD/ 4K LED Screen, Licensed Window10 OS or better, MS Office Professional- 01 Qty 1 KVA UPS– 01 Qty
Evaluation Criterion	Bidder should have updated brochure uploaded in their global website. (Availability of brochure on request will not be granted) CE Certificate with CE registration number for Microscope and Camera both should be downloadable from OEM's website The OEM should have Certified trained engineer and service centre in Eastern Region (Kolkata /Bhubaneswar /Sambalpur) for an immediate after sales support and should provide the details and documentary evidence of the same. GST certificate of service office should be enclosed. Buyer will take the decision of physical demo if it is found necessary.
Power Back Up	Instrument should be supplied with a Branded online UPS with 30 min backup.
Warranty	1-year Standard Warranty from the date of Installation and 4 years of AMC after warranty
Installation & Training	Seller should install the Microscope in Department of Earth Science, Sambalpur University, Sambalpur without additional cost. Minimum 02 days hands-on training should be imparted to end users.

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Ref. No. 3897(35)/CIF **Date: 26.08.2025**

Supply and installation of ELECTRICAL RESITIVITY METER

TECHNICAL SPECIFICATIONS

- Large Backlit graphic display.
- Conductivity, salinity and TDS testing
- One-to-five-point conductivity calibrations, one point salinity calibrations, one-to-five-point TDS calibrations and one-point temperature adjustment calibrations.
- Stabilizing and ready indicators identify when measurements are complete
- Non-volatile memory holds up to 500 data points with time and date stamp.
- Output data and calibration logs to a printer or computer for long-term data storage

Conductivity

Range : 0.00 µS/cm to 500.0 mS/cm
Resolution : 0.01, 0.1, 1 µS/cm; 0.01, 0.1 mS/cm
Relative Accuracy: ±0.5% reading ±1 LSD
Calibration Points: 1 to 5 points
Calibration method: Automatic standard recognition with manual entry option
Temperature compensation: Linear (0 to 10 %/°C) or off
Reference temperature: 15.0, 20.0, 25.0 or 30.0 °C

Salinity

Range: 0.00 to 80.0 ppt; 0.00 to 42.0 PSU
Resolution: 0.01, 0.1 ppt; 0.01, 0.1 PSU
Relative accuracy: ±0.5% reading ±1 LSD
Calibration points: 1 point
Modes: Natural Seawater (ppt) or Practical Salinity (PSU)

TDS

Range: 0.00 ppm to 500.0 ppt (1.00 factor)
Resolution :0.01, 0.1, 1 ppm; 0.01, 0.1 ppt
Relative accuracy: ±0.5% reading ±1 LSD
Calibration point: 1 to 5 points
TDS factor: 0.40 to 1.00

Temperature

Range : -5 to 105°C, 23 to 221°F
Resolution : 0.1
Relative Accuracy: ±0.3 °C, ±0.5 °F
Calibration points :1 point
Offset adjustment :Up to ±5 °C

Datalogging

Number of points : 500 with time and date stamp

Features

Read types: Continuous, Auto-Read, Timed
Calibration log: Active conductivity, salinity, TDS, temperature with time and date
Self-test: Automatic with startup
Input: 8-pin MiniDIN
Data output: Computer or printer
Data output format: CSV or print
Warranty: 3 years and 2 years AMC after warranty

Certifications: CE, cTUVus, FCC Class B, CES-001, KC, RCM
Enclosure: IP-54
Power 100-240 VAC, 50-60Hz, 9 DC adapter, 1.3A

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Dimensions (L x W x H): 198.3 mm x 155.2 mm x 61.7 mm, 7.81" x 6.11" x 2.43"
Weight: 700 grams, 1.54 lbs

Conductivity probe
Cell Material: Platinized epoxy/platinum
Range: 1 µS/cm to 20 mS/cm
Cell Constant: 1.0 cm^{-1}
Dimensions: Dia - 12 mm Length - 120 mm
Min/Max Immersion: 20/90 mm

Instrument should be supplied with a Branded online UPS with 30 min backup.

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Ref. No. 3897(36)/CIF **Date: 26.08.2025**

Supply and installation of WATER PURIFICATION SYSTEM

TECHNICAL SPECIFICATIONS

Maximum Input Water TDS allow to the system	: 1000 to 1500
Ultraviolet (UV) LAMP	: Yes
Conformity to Standard for Ultraviolet system	: IS 14724 (latest) for water purification system with Ultraviolet disinfection
Reference voltage for Electro dine Module)	: 1.5 v to 3 v
Provision of Arsenic removal	: Yes
Provision of Chloride removal	: Yes
Hardness removal	: Yes
Digiflow meter	: Yes
Micron Filter	: Yes
Pre filter housing	: Yes
Pre filter size	: 10 inch
Particulate filter porosity	: 5 micron
Storage tank	: External
Storage tank material	: HDPE
Storage Tank Capacity in L	: 50
Digital display	: Yes
Body of filter	: ABS Food grade
Installation Type	: Wall mounted
Power supply	: 230 V single phase
Installation and commissioning inclusive in the scope of Supply	: Yes
Total Dissolved Solids Removal Percentage	: 90%
Flow Rate	: Type II : 10 litters per hour and Type I : 4 litters per minute
Type 1 resistivity	: 18.2MΩ x cm
Type 1 conductivity	: 0.055µS/cm
Type 2 resistivity	: >10MΩ x cm
Type 2 conductivity	: <0.1µS/cm
TOC Level	: <2ppb
RNase	: <0.01ng/ml
DNase	: <4pg/µl
Bacteria	: <0.1CFU/ml
Endotoxins	: <0.001EU/ml
Particles (>0.22µm)	: <1ml

The system should be able to produce both type 1 and type 2 water from portable drinking water
The output is suitable for HPLC, GC, AAS and Environmental applications
Warranty: 3 Years warranty and 2 years of AMC after warranty

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Ref. No. 3897(37)/CIF **Date: 26.08.2025**

Supply and installation of FAST PERFORMANCE LIQUID CHROMATOGRAPHY

S. No.	Technical Specifications
1.	Capable of controlled delivery of independent four solvents inlet for binary gradient, linear mode, isocratic and step gradient. Should be able to separate the mixture sample loading of 100 mg to 100g or more.
2.	Compatible with both normal and reversed phase purification conditions.
3.	Solid and liquid loading of samples should be possible.
4.	Solvent Flow Rate and Pressure: 1-250 mL /min or better at 50 bar (725 PSI) or better
5.	The Instrument should have 4 solvent inlet and should have level sensors for all 4-solvent suction line and waste line
6.	The system should have vapor sensor in the system for leak detection and safety
7.	System should be able to generate binary gradient of desired ratio.
8.	The detector should be able to detect both chromophoric (UV active) compounds. The system should have variable PDA or DAD detector with Scan function.
9.	The system should be capable to do simultaneous detection of multiple wavelengths in the Range 200 – 800 nm with accuracy of ±2 nm, ability to detect/monitor more than 3 wavelengths at a time, The system should have peak purity option with 3D scan of the chromatogram.
10.	The system should have the capability to change the detector sensitivity.
11.	The system should be able to change Flow Rate, Gradient and Detector Threshold during run.
12.	Air purging option should be available for Cartridges and Sample Loader.
13.	Touch-screen controlled software for operation of the machine with the option of USB and LAN ports.
14.	Automatic gradient method set-up based on inputting TLC Rf value.
15.	Automatic gradient method set-up based on inputting HPLC retention times.
16.	The system should come along with minimum 2 nos. Racks that can hold tubes of different sizes to collect minimum 100 fractions (25mL each) or more.
17.	System should have Rack RFID and Cartridges RFID to detect them automatically.
18.	The system software should have auto-gradient optimization, Auto – gradient hold and slope detection options.
19.	The system should be capable of running separation in both Gravity and Anti-gravity modes for higher resolution.
20.	System should have Sample rack vapor enclosure for operation outside the hood with active exhaust.
21.	The system should have active pressure sensors, with automatic flow reduction and pressure monitor cut-off for safety.
22.	The system should be provided with all necessary tubing, etc. for installation and smooth running of the instrument.
23.	Silica cartridges of following sizes and numbers should be supplied along with the system: a) 10g-12g: 15-20 Nos. b) 20g-25g: 10-15 Nos.
24.	C18 cartridges of following sizes and numbers should be supplied along with the system: a) 20g-25g: 5-10 Nos.
25.	Empty loader cartridges of following sizes and numbers should be supplied along with the system: a) 10g or 12 g: 20 Nos
26.	All the modules of instruments, cartridges and columns should be from same/single manufacturer.

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27. System should have the flexibility of using any make flash cartridge available in the market.
28. Warranty: 5 years

29. Installation and Demonstration of the instrument at the installation site should be done.

30. Instrument should be supplied with a Branded online UPS with 30 min backup.

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