Annexure B

DEPARTMENT OF PHYSICS UNIVERSITY OF LUCKNOW, LUCKNOW-226007

TENDER NO: CRG/LU-PHY/003/2025-2026, Dated: 27th December, 2025

Tender /Bid invited
For purchase of Four Probe Gas Sensor Testing Unit
For the ANRF-IRG Major Research Project

Project No. ANRF/IRG/2024/000177/PS

Department of Physics, University of Lucknow, Lucknow- 226007

Non transferable

DEPARTMENT OF PHYSICS
UNIVERSITY OF LUCKNOW
LUCKNOW-226007

TENDER NO. – CRG/LU-PHY/003/2025-2026, **Dated:** 27 December, 2025

Notice: Inviting tenders for purchase of Four Probe Gas Sensor Testing Unit for the ANRF-IRG Major Research Project, in the Department of Physics, University of Lucknow, Lucknow-226007.

Sealed tenders are invited from registered, experienced, and reputed firms under Two Bid system i.e. Technical Bid & Financial Bid for purchase **Four Probe Gas Sensor Testing Unit** under **ANRF-IRG Major Research Project** in the Department of Physics, University of Lucknow, Lucknow.

1. Detailed description of items required along with specifications and qualification criteria. **(Please see Annexure 1).**

2. Time Schedule:
Date of uploading of Bid document: 27th December 2025
Last date and Time for receipt of Tenders: 05th January, 2025 by 12:00 noon.
Date and time for opening of Bid: 15th January, 2025 by 3.00 p.m.
Place of Submission of Tender: Dr. Chandkiram Gautam/Head of Department, Contact No.: 8840389015
Department of Physics, University of Lucknow, Lucknow – 226007 (U.P.)

3. Cost of tender Form: Rs 2000/- (Two Thousand only+18% GST) in the form of Bank draft of any Nationalized Bank in favor of Finance Officer, University of Lucknow payable at Lucknow, must be enclosed with tender form. Cost of tender form is Non-refundable.

4. Validity of Tender: 90 days from the date of opening of tender.

5. Interested firms may submit the documents completed in all respects along with Earnest Money Deposit (EMD) of Rs. 36,379/- (Rupees thirty-six thousand three hundred and seventy-nine only) in the name of Finance Officer, University of Lucknow, Lucknow – 226007 in the form of Bank Draft only, of any Nationalized Bank.

6. The University of Lucknow, reserves all rights to amend or withdraw any of the terms and conditions contained in the tender document or to reject any or all tenders without giving any notice or assigning any reason. The decision of University of Lucknow in this regard shall be final and binding on all.

Dr. Chandkiram Gautam,
Associate Professor in Department of Physics
For REGISTRAR, University of Lucknow,
Lucknow- 226007

TENDER FORM

The bidders should furnish the under mentioned information and enclose copies of the respective documents as mentioned below failing which their bids will not be considered.

1. Name of the firm:

Full Address:

2. Name of the Proprietor:

3. Telephone / Mobile Number:

4. Bank Account Number:

(Please enclose proof)

5. Income Tax Permanent Account Number:

(Please enclose Photocopy)

6. G.S.T. Registration No.:

(Please enclose Photocopy)

7. Income Tax return for the past three years:

(Please enclose photocopies)

8. Firm deed & Registration of the Firm:

(Please enclose photocopy)

9. (a) Details of Demand Draft towards the cost of the Tender:

Draft No. Date: Amount: Rs 2000/- +18% GST=2360/-

Name of the issuing Bank:

(b) Details of Demand Draft towards the cost of Earnest Money Deposit (EMD):

Draft No. ……Date: ..... Amount: Rs 36,379/-

Name of the issuing Bank:

Demand Drafts should be drawn in favor of Finance Officer, University of Lucknow, Lucknow, payable at any Nationalized Bank at Lucknow.

Tenders/Bids not accompanied by the requisite Demand drafts shall not be considered and shall be rejected.

Annexure-1

Four Probe Gas Sensor Testing Unit for Department of Physics, University of Lucknow

1(a) Four Probe Gas Sensor Testing Unit Qty: 01

Scope: Supply, installation, commissioning, and training of complete and ready-to-use Four Probe Gas Sensor Testing Unit with appropriate accessories.

Application: A gas-sensing unit is essential for accurately detecting, measuring, and monitoring various gases in environments where safety, quality control, and environmental assessment are critical. These systems are widely used for industrial safety to identify toxic or flammable gas leaks, for environmental monitoring to track air-pollution levels and greenhouse gases, and in laboratories and research for studying gas reactions or validating sensor performance. They also play an important role in medical and biomedical applications, such as respiratory analysis and anaesthesia monitoring, as well as in automotive, agricultural, and smart-building systems where continuous air-quality assessment.

1.	**VACUUM CHAMBER INTERIOR**	
1.1	Chamber outer size	~100 mm × 300 mm length
1.2	Hot face area	50 m diameter × 100 mm
1.3	Shell construction	High quality stainless steel 316 body and S. S. Angle's structure with proper stiffness
1.4	Shell design	Suitable for vacuum and pressure 1m bar
1.5	Hot plate surface	50 m, sample holder
1.6	Sample holding mechanism	Four clamps should be available for placing the sample and electrical connection
1.7	Chamber opening	Side opening flange
1.8	Connections	Vacuum, gas inlet, heater, thermocouple, and electrical output of gas sensor
2.	**HEATING SYSTEM**	
2.1	Heating elements	Strip heater
2.2	Operation	AC/Single phase
2.3	Power	~0.25 kW
2.4	Temperature	500 °C (Maximum)
2.5	Working temperature	400 °C
3.	**CONTROL SYSTEM**	
3.1	Temperature control	Microprocessor based PID programmer cum Digital Temperature controller cum Indicator
3.2	Temperature sensor	K- type thermocouple

3.3	Accuracy	±1°C
3.4	Indicators	a. Ammeter b. Voltameter c. Mains indicator d. Output indicator
3.5	Control switch	Mains on, Output on
3.6	Safety elements	Input and Output fuses
4.	**SAMPLE HOLDER**	
4.1	Number of Sample holder	One adjustable sample holder
5.	**CONTROLLED ATMOSPHERE**	
5.1	Controlled atmosphere	a. Gas Inlet and outlet ports with compatible valve b. Auxiliary port
5.2	Gas purging	Furnace should be suitable for various gasses along with an on/off valve with two inlet gasses.
5.3	Gas cylinder & regulator	As per requirement
5.4	Bubbler	Standard bubbler
6.	**VACUUM PUMP**	
6.1	Model	Rotary vacuum pump
6.2	Vacuum	760Hg
6.3	Make	Value
6.4	Gauge	Analogue gauge
7.	**MASS FLOW CONTROLLERS**	
7.1	Mass flow controllers	Two Mass Flow Controllers
7.2	Gas mixing chamber	Made with SS and available
7.3	Gas mixing software	Available
8.	**SPECIFICATION OF MASS FLOW CONTROLLERS**	
8.1	Mass Flow Controller Make	AALBORG USA
8.2	Power supply	12 volts
8.3	Tube Fittings	1/4”
8.4	Accuracy (+/-)	1.5% of FS
8.5	Controller Value	Solenoid control value

8.6	Adjustment	LCD display and Flow adjustment potentiometer.
8.7	Metal Body	SS body, Viton seals
8.8	Gases	Pre-Calibrated
8.9	Analog Input	Available
8.10	Accuracy	± 0.8% of Reading + 0.2% of Full Scale
8.11	Repeatability	± 0.2% Full Scale
8.12	Operating Range	0.5% to 100%
8.13	Typical Response Time	100 ms and Adjustable
8.14	Operating Temperature	−10 to +50 ˚C
8.15	Humidity Range	0 to 100% Non–Condensing
8.16	Controllable Flow Rate	Full Scale
8.17	Maximum Pressure	145 PSIG
8.18	Electrical Connections	15 Pin
8.19	Supply Voltage	12 V (DC)
8.20	Supply Current	0.75 Ampere
8.21	Input /Output Digital Signal	Mass Flow control
8.22	Input / Output Analog Signal	0-5 V (DC)
8.23	Gas temperature	Ambient
8.24	Typical Response Time	100 msec
8.25	Warm up period	<1 sec
9.	**PIPE LINE CONNECTION**	
9.1	Pipe lines	High-Pressure stainless-steel pipe lines **-1/4" OD**
9.2	Needle Valves	Automated,
9.3	Fittings	High-grade corrosion resistant stainless steel
10.	**PROBE & WIRE LEADS**	
10.1	Material	Silver- Ag
11.	**SOURCE MEASURE INSTRUMENT SPECIFICATIONS**	

11.1	Make	Keighley
11.2	General requirement	a. Instrument should be capable of analyser, curve tracers, and I-V system. b. Accessories to be supplied: Test Leads, Mating Mass Terminated Screw Connector, USB Cable, Ethernet/TSP Cable, Interlock Adapter, Power Cord, User Guide, Banana Test Leads, 4 terminal test leads
11.3	Multimeter	6 1/2 Digits High-Performance DMM
11.4	Speed	High Speed: 50K RDGS/S
11.5	Measurements	Dual Measurements & Displays Temperature Measurements Multi-Measurement & Math Functions True RMS
11.6	RS 232 port	Available to connect the computer
11.7	Software	Necessary software with lab view platform should be provided
11.8	Programming platform	Lab view data logging and online software Graphs Plotted between 1. Time Vs Sample Temperature 2. Time Vs Resistance
11.9	Computer	a. Intel Core i3 processor with Mother Board, b. 4 GB DDRIIIRAM, c. 1 TB Hard Disk, d. 18.5 or 17 " LED Monitor, e. Keyboard, f. Optical Mouse, g. DVD Writer
12.	**COMPUTER & SOFTWARE**	
12.1	Software	Necessary software with lab view platform to be provided.
12.2	Programming platform	Lab view data logging and online software Graphs to be plotted between 1. Time Vs Sample Temperature 2. Time Vs Furnace temperature 3. Time Vs Voltage 4. Time Vs Current 5. Time Vs Resistance
12.3	Computer	Intel Corei3 CPU with Mother Board, 4 GB DDR III RAM
12.417.	**ACCESSORIES**	
12.5	The firm must provide some necessary additional accessories along with the FTIR setup 1. Multimeter Probe 2. Military Connector 3. Electrode	

	4. Silver Probe (compatible with gas sensing setup)	
13.	Documentation	1. OEM with direct sales and distribution channel in India shall have operational factory/office for minimum two years as on bid submission date. Proof to be furnished in technical bid. 2. In case of exclusive distributor, authorization certificate from OEM shall be furnished. 3. OEM and exclusive distributor must have worked together for minimum two years as on bid submission date. 4. Proof to be furnished in technical bid. 5. Vendor shall enclose latest scope of accreditation of their ISO/IEC 17025 accredited calibration lab in technical bid. 6. Vendor shall enclose CE certificate for offered model in technical bid. 7. Vendor shall provide user and maintenance manuals, calibration certificates along with the machine. 8. Vendor shall provide site requirements in technical bid.
14.	Local support	1. Vendor shall have an operational service centre in India. Number of trained service engineers employed in this region to be mentioned in technical bid. 2. Vendor shall arrange demonstration of similar or higher capacity system in India upon request from the purchaser.
15.	Future upgradation	The vendor must provide at least two gas cylinders or more with Hydrogen gas (H_2) cylinder being mandatory. The quoted accessories shall be OEM-approved, compatible with the existing system architecture, and compliant with all relevant safety and regulatory standards.

Items 1(a) as mentioned above should be compatible with each other and these modules should be interfaced and make functional at University of Lucknow, Lucknow, India.

Qualification Criteria:

1) Software must be provided, installed, and demonstrated.
2) Complete Hardware and Software environment for the working of the Four Probe Gas Sensor Testing Unit must be provided.
3) Technical and financial bids, duly signed and stamped, to be kept separately in sealed envelopes. The envelope containing bids be marked on top as "Technical/Financial bids for items (Name of the scientific equipment) required for project in the Department of Physics, University of Lucknow."
4) An undertaking that guarantees of Four Probe Gas Sensor Testing Unit, after the final installation of the software in our premises must be provided. In case of failing to do so (with maximum deviation of 5% from the results submitted in the bid), the University reserves the right to deduct 10% money from the payment.
5) The payment for the purchase would be done after the delivery of Four Probe Gas Sensor Testing Unit.
6) The lowest bid which meets the specification and scientific use will be qualified for the Financial Bid.
7) The bidder must be registered under the companies' act 1956 or a registered firm. And have a registered office in India.
8) Bidder must not be blacklisted by any government organization in India; a notarized declaration must be submitted with the bid.
9) The firm should be capable of mobilizing adequate arrangement for the supply of scientific equipment/items required for various projects in the Department of Physics, University of Lucknow, Lucknow.
10) For legal dispute, if any, the jurisdiction will be limited to the District of Lucknow.
11) **Tender should be addressed in the name Head, Department of Physics, University of Lucknow, Lucknow-226007.**
12) With tender form, specification of equipment or item supplied must be written, sealed, and signed by the authorized signatory.
13) Quantity to be supplied and work to be completed may change at the time of order.
14) Noncompliance of order, in time, will be treated as non-compliance of the terms and conditions.

All documents stated above should be marked as Annexures 1 and submitted in serial order
General Terms and conditions:

1. Technical Bid should contain **item-wise compliance chart** clearly tabulated, for the 1 item and sub-items mentioned under the specifications. The compliance chart should be duly authenticated by an authorized person of the company.
2. Financial bids for the product whose technical bid is not acceptable will not be opened.
3. The delivery period should be specifically stated – preferably 08-09 weeks from the date of purchase order.
4. Penalty @ 10% of the value of the order shall be imposed for every day of delay in the supply of the full order.
5. Maximum educational discounts should be provided.
6. Rates quoted by the firms are negotiable.
7. Installation within 10 days after receiving the system at the University. The price should be inclusive of full installation on site with full functionality demonstration.
8. Quotations & Payment in Indian Rupees only.