

**पर्यावरण विज्ञान संभाग**  
**Division of Environment Science**  
**भारतीय कृषि अनुसंधान संस्थान, नई दिल्ली- 110012**  
**I.C.A.R.-Indian Agricultural Research Institute New Delhi-110012**

**NOTICE FOR E-PROCUREMENT THROUGH GEM**

निदेशक, भाकृअनुप - भारतीय कृषि अनुसंधान संस्थान, नई दिल्ली द्वारा निम्नलिखित वैज्ञानिक उपकरण की आपूर्ति एवं कार्य हेतु प्रतिष्ठित निर्माताओं/अधिकृत डीलरों/आपूर्तिकर्ताओं से दो बोली प्रणाली (तकनीकी एवं वित्त बोली) के अन्तर्गत ऑन-लाइन क्यूटेशन GeM पर आमंत्रित की जाती हैं। क्यूटेशन/निविदा प्रस्तुत करने की अंतिम तिथि 08.01.2024, समय 13:00 बजे दोपहर तक है। क्यूटेशन/निविदा को दिनांक 08.01.2024 को दोपहर 13:30 बजे निर्धारण समिति के समक्ष खोला जाएगा।

On-line Bids on GeM are invited from reputed Manufactures/Supplier/Authorized Dealer in two bid system (Technical bid & Financial bid) for purchase of following Scientific Equipment on behalf of Director, ICAR-Indian Agricultural Research Institute, New Delhi. **The last date for submission of Bid is 08.01.2024 at 13:00 PM. The bid will be opened on 08-01-2024 at 13:30 PM by the prescribed committee.**

विसृत नियम व शर्तों को भारतीय कृषि अनुसंधान संस्थान की वेबसाइट [www.iari.res.in](http://www.iari.res.in) पर देखें एवं ऑन-लाइन के लिए इसे [www.gem.gov.in](http://www.gem.gov.in) पर भी देखा जा सकता है। Please visit [www.iari.res.in](http://www.iari.res.in) for Details Rules and Regulation and log on [www.gem.gov.in](http://www.gem.gov.in) for online bidding.

क्र.सं. S.No.	वैज्ञानिक उपकरण का नाम Name of Scientific Equipment	मात्रा Quantity	धरोहर राशि Earnest Money	Cost of the Equipment
1.	Gas chromatograph analyser for Greenhouse Gas Analysis	एक One	रूपये 60,000/-	30 Lacs

The tender details are mentioned below:

Tender No.	GEM/2023/B/4359028
Bid Submission start date & time	18/12/2023 13:00 PM
Last date & time for submission of bid	08/01/2024 13:00 PM
Date & time for opening of technical bid	08/01/2024 13:30 PM
Cost of estimated bid value (in Rupees)	Rs. 30,00,000/-

**बोली लगाने के निर्देश और नियम व निविदा की शर्तें Instructions to the bidder and terms & conditions of tender :**

1. आपके द्वारा दी गई मूल्य दर क्यूटेशन प्राप्त हेतु निर्धारित अंतिम दिन से कम से कम 180 दिनों तक मान्य होगी। यदि आपूर्तिकर्ता द्वारा 180 दिनों की न्यूनतम अवधि की वैधता के संबंध में कोई अन्तर हो तो उसका विशेष रूप से उल्लेख होना चाहिए। The rates quoted shall be valid for a minimum period of 180 days from the last date fixed for the submission of bid.
2. क्यूटेशन में दर्शाई गई दरों में भारतीय कृषि अनुसंधान संस्थान, नई दिल्ली के पर्यावरण विज्ञान संभाग, भा.कृ.अनु. संस्थान, नई दिल्ली - 110 012 में सामान/सामग्री की निशुल्क आपूर्ति अथवा स्थापन करना शामिल होगा। हालांकि, विदेशी मुद्रा में दर्शाए गए उपकरण को एफ.ओ.बी./सी.आई.पी. आधार पर दर्शाया जाए। **The rates quoted shall be free of cost delivery and installation at the Division of Environment Science, IARI, New Delhi - 110012. However, equipment quoted in foreign currency must be quoted on FOR basis (including taxes).**
3. यदि सामान विदेश निर्मित है और दर विदेशी मुद्रा में दर्शाई गई है तो ऐसी परिस्थिति में कस्टम ड्यूटी छूट प्रमाण पत्र (सी.डी.ई.सी.) जारी किया जाएगा जो कि केवल भारतीय कृषि अनुसंधान संस्थान के लिए ही मान्य होगा। **Custom Duty Exemption Certificate (CDEC) will be issued only when the bid is quoted in foreign currency in case of foreign made items only and meant for IARI.**
4. क्यूटेशन में संबंधित सामान का पूरा विवरण दिया जाएगा | Full specifications of the item/article quoted for shall be given in the quotation.
5. उपरोक्त दर्शाई गई दर में यदि किसी भी प्रकार का अतिरिक्त कर/टैक्स/ड्यूटी लगाई जाती है तो उसके वास्तविक प्रतिशत का संकेत स्पष्ट रूप से दिया जाना चाहिए। If taxes, duties or any other charges over and above the rates quoted leviable, actual percentage of such taxes/duties/other charges should be clearly indicated.
6. बोली के साथ बतौर धरोहर राशि उपकरण के सामने दर्शाई गई राशि के अनुसार लगाई जाए/ डिमांड मांग ड्राफ्ट/भुगतान आदेश/सावधि जमा रसीद/बैंक गारंटी जो कि निदेशक, भारतीय कृषि अनुसंधान संस्थान, नई दिल्ली - 110012 के नाम पर किसी भी राष्ट्रीकृत बैंक में देय हो, को अवश्य संलग्न किया जाना चाहिए जिसके बिना क्यूटेशन पर विचार नहीं किया जाएगा। धरोहर राशि की मूल प्रति सीधे तौर पर संबंधित निविदा आमंत्रित करने वाले अधिकारी को अन्तिम तारीख तक या ऑफ-लाइन दर जमा करने से पूर्व पहुंचाया जाना चाहिए। डिमांड मांग ड्राफ्ट/भुगतान आदेश/सावधि जमा रसीद/बैंक गारंटी से संबंधित सभी जानकारी व्यक्तिगत रूप से भेजी जानी चाहिए। इस संबंध में प्राप्त स्कैन प्रति/या जो डाटा आपूर्तिकर्ता द्वारा दर जमा करने के दौरान दिया गया है, उससे मिलान किया जाएगा अन्यथा इस क्यूटेशन को निरस्त माना

जाएगा। **EMD must be attached as shown above** in the form of DD/Fixed Deposit Receipt/Bank Guarantee from commercial bank drawn in favour of Director, IARI payable at New Delhi – 110 012. The original EMD should be submitted to the Tender Inviting Authority on or before the last date and time of online bid submission. The details of DD/Fixed Deposit Receipt/Bank Guarantee physically sent, should tally with the details available in the scanned copy and the data entered during the bid submission time otherwise the uploaded bid will be rejected.

7. इस संस्थान द्वारा निविदाकर्ता को किसी भी सुरक्षा जमा राशि पर ब्याज नहीं दिया जाएगा। No interest on Security Deposit and Earnest Money Deposit shall be paid by the Institute to the tenderer.
8. क्यूटेशन प्रक्रिया पूरी होने के उपरान्त असफल बोलीदाताओं को उनकी जमा की गई धरोहर जमा राशि वापिस कर दी जाएगी जबकि सफल बोलीदाता के मामले में यह राशि नियम के अनुसार सुरक्षा जमा के रूप में समायोजित की जा सकती है जो कि आदेश राशि की 2 प्रतिशत होगी और यह **डिमांड मांग ड्राफ्ट/भुगतान आदेश/सावधि जमा रसीद/बैंक गारंटीनिदेशक, भारतीय कृषि अनुसंधान संस्थान, नई दिल्ली - 110012** के नाम पर किसी भी राष्ट्रीकृत बैंक में देय हो, जिसकी वैधता सभी कार्यों को पूरा करने के 60 दिनों के उपरान्त तथा साथ ही उपकरण जिसकी कीमत (रूपये 1.00 लाख या इससे अधिक) की गारंटी भी शामिल होगी। हालांकि, जो उपकरण रूपये 1.00 लाख से कम है, उस परिस्थिति में किसी भी प्रकार की निष्पादन जमा राशि नहीं दी जाएगी। The EMD shall be refunded to the unsuccessful bidders after finalization of the quotation. In case of successful bidders, it can be adjusted towards security deposit which is 2 % of the order value in the form of DD/Fixed Deposit Receipt/Bank Guarantee from commercial bank drawn in favour of Director, IARI payable at New Delhi – 110 012 and shall remain valid for 60 days beyond the date of completion of all contractual obligation of supplier including warranty obligation for the equipment costing Rs.1.00 lakh (Rs. One lakh only) or more. Here would however, be no performance security deposit for equipment/goods costing less than Rs. 1.00 lakh (Rupees One lakh only).
9. फर्म द्वारा 02 वर्ष की वारंटी प्रदान की जाएगी। यदि सामान/उपकरण के विवरण में वारंटी की अवधि में किसी भी प्रकार का परिवर्तन है, तो उस वारंटी को अंतिम माना जाएगा। Two years warranty has to be invariable provided by the firm. In case, there is any variation in the warranty period given in the specification of the item/equipment, the warranty period shall be the final as given in the specification.
10. कार्य पूरा होने के बाद फर्म/आपूर्तिकर्ता को तीन प्रतियों में पूर्व-रसीद बिल प्राप्त होने के उपरान्त ई-पेमेंट के माध्यम से भुगतान किया जाएगा। Payment will be made by mode of e-payment to the supplier/firm after satisfactory completion of work and receipt of pre-receipt bills in triplicate.

भारतीय कृषि अनुसंधान संस्थान  
नई दिल्ली - 110012  
मुख्यालय, प्लॉट नं. 1, इंदिरा गांधी रोड, नई दिल्ली - 110012  
फोन: 011-26086111, 26086112, 26086113, 26086114, 26086115, 26086116, 26086117, 26086118, 26086119, 26086120, 26086121, 26086122, 26086123, 26086124, 26086125, 26086126, 26086127, 26086128, 26086129, 26086130, 26086131, 26086132, 26086133, 26086134, 26086135, 26086136, 26086137, 26086138, 26086139, 26086140, 26086141, 26086142, 26086143, 26086144, 26086145, 26086146, 26086147, 26086148, 26086149, 26086150, 26086151, 26086152, 26086153, 26086154, 26086155, 26086156, 26086157, 26086158, 26086159, 26086160, 26086161, 26086162, 26086163, 26086164, 26086165, 26086166, 26086167, 26086168, 26086169, 26086170, 26086171, 26086172, 26086173, 26086174, 26086175, 26086176, 26086177, 26086178, 26086179, 26086180, 26086181, 26086182, 26086183, 26086184, 26086185, 26086186, 26086187, 26086188, 26086189, 26086190, 26086191, 26086192, 26086193, 26086194, 26086195, 26086196, 26086197, 26086198, 26086199, 26086200

11. निदेशक, भारतीय कृषि अनुसंधान संस्थान, नई दिल्ली के पास बिना कारण बताये सभी क्यूटेशनों को पूर्ण या आंशिक रूप से स्वीकार अथवा अस्वीकार करने के अधिकार प्राप्त हैं। The Director, IARI, New Delhi reserves the right to accept or reject any or all the quotations either in full or in parts without assigning any reason.
12. उपरोक्त शर्तों का अनुपालन नहीं करने वाली क्यूटेशनों को निरस्त किया जा सकता है। Quotations not complying with the above conditions are liable to be rejected.
13. PAN/G.S.T. Nos. की स्कैन प्रति को क्यूटेशन के साथ संलग्न किया जाए। Scanned copy of PAN/G.S.T. Nos. may be attached with the bid.
14. किसी कारण अनुबंध में कोई विवाद उत्पन्न होने पर उसका निपटारा भारतीय कानून व न्यायालय, नई दिल्ली के अधिकार क्षेत्र के अधीन किया जाएगा। सचिव, भारतीय कृषि अनुसंधान परिषद (ICAR) द्वारा एकमात्र मध्यस्थ नियुक्त किया गया है, जिसका निर्णय दोनों पक्षों (Supplier Purchaser) के लिए बाध्यकारी एवं अंतिम होगा। In case, any dispute arising out of this contract shall be subject to the jurisdiction of Indian Laws and Court at New Delhi. Sole Arbitrator is appointed by the Secretary, ICAR, New Delhi. His decision will be final and binding on both the parties (Supplier and Purchaser).
15. सफल बोलीदाता को सौंपे गए कार्य अथवा उपकरण की आपूर्ति को निर्धारित अवधि के भीतर पूरा करना होगा जैसा कि आपूर्ति आदेश में निर्दिष्ट किया गया है। ऐसा नहीं करने पर नकद नुकसान प्रभार के रूप में बिल में से कम से कम 2 प्रतिशत और अधिकतम 10 प्रतिशत की कटौती की जाएगी। The successful bidder has to supply the equipment as mentioned in the supply order placed with them within the stipulated period as given in the supply order placed by this office failing which 2 % per week and maximum of 10 % deduction as liquidated damage charges will be made from the bill in case the job is not completed within the given stipulated period.
16. As per Audit requirement the Successful bidder will be required to submit Proforma Invoice from the principal/manufacturer before issue of Purchase Order.
17. **Exemption from EMD submission is meant for procurement of only goods produced and service rendered by MSEs and not for any trading activities by them**
18. उपकरण के विस्तृत तकनीकी विनिर्देश अनुलग्नक 'ग', में संलग्न हैं। Detailed Technical Specifications of the equipment are attached at Annexure 'A'.

  
सहायक प्रशासनिक अधिकारी  
आहरण और वितरण अधिकारी  
Asstt. Admn. Officer  
पर्यावरण विज्ञान संभाग  
Division of Environment Science  
भा.क.अनु.प.-भारतीय कृषि अनुसंधान संस्थान  
ICAR - Indian Agricultural Research Institute  
नई दिल्ली / New Delhi-110012

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## Technical Specification of Gas Chromatograph with accessories for Greenhouse gases analysis- Supply, Delivery, Installation and Commissioning

The Highest performance, Modern design Gas Chromatograph analyser system should be suitable for analysis of Greenhouse gases CH<sub>4</sub>, CO, CO<sub>2</sub> and N<sub>2</sub>O in Ambient Air samples with following minimum configuration:

1. GC Mainframe
2. Column Oven
3. Automatic Gas sampling valves & injector for syringe – 2nos
4. Flame Ionization Detector (FID) – 1no.
5. Electron Capture Detector (ECD) – 1no.
6. Data Management and Acquisition System – 1no.
7. Software System – 1no.
8. GC Column, Spares & Consumables
9. Required Accessories for GC Operation
10. Installation & Training
11. Warranty and Annual Maintenance

### 1. GC Mainframe

- Must be able to support at least 3 inlets and 4 detectors.
- Must be possible to have more than 2 detectors mounted, with more is preferred and monitored simultaneously on the GC and software.
- Must have advanced intelligent self-diagnosis feature. Electrical system, flow control systems and sensors must be fully supported by the operating software.
- Must provide software that monitors GC counters and provides graphic display. Also must provide a real-time notification via indicator/advisor when a counter limit has been reached for consumables.
- GC must have a full colour touchscreen display panel with Graphical User Interface (GUI).
- One button access to service, maintenance and log from the keyboard must be available.
- Pre-programmed leak tests must be available from touchscreen display or monitoring software for safety purposes.
- Standard atmospheric pressure and temperature compensation must be available.
- Advanced techniques such as - Heart Cut GC System, Detector Splitting System (multiple detection capability), Detector Switching System, and/or Backflush System should be available with easy-to-use software.
- Retention time repeatability : <0.008% (or equivalent to 0.0008min)
- Area repeatability : <0.5% RSD
- An extensive self-diagnosis function with safety features helps prevent unexpected instrument malfunctions. It enables a detailed diagnosis of the septum and insert usage status, whether there is a temperature sensor error, gas supply pressures, control status of each gas, ignition function, DC voltage, AD converter, and other factors.
- Must be an Eco-GC with Gas Saver function that considerably reduces carrier gas consumption after injection or on stand-by.
- Must have auto-shutdown feature that configures the GC to shutdown automatically after a batch run to conserve energy and gas.
- Must support USB and/or LAN communications with PC

7 Technical Specification Prepared by *[Signature]* (Indenter)

*[Signature]*  
(A.K. Bhatia)

**2. Column Oven**

- Operating temperature range: ambient + 2°C to 450°C
- Oven temperature set point resolution must be 0.1°C.
- Oven must support more than 30 ramps and negative ramps must be allowed.
- Maximum achievable temperature ramp rate must be 120°C/min.
- Oven temperature program set point resolution for the temperature ramp rate must be 0.01°C.
- Maximum run time of at least 999 minutes
- Oven cools down from 450°C to 50°C must be less than 4 mins (under non-specific conditions), with built-in programmable oven cool-down rate readily available to cater for columns of different stability.
- Temperature stability for < 0.01°C for a 1°C ambient change, ensuring the maintenance of oven internal temperature with respect to external fluctuations.

**3. Automatic Gas Sampling Valves (GSV) – 3nos & Injector for syringe – 1no**

- System should be provided with suitable automatic Gas sampling valves, control box, columns, column switching valves and related accessories for automatic sampling & injecting to column to get desired analysis of Greenhouse gases – CO<sub>2</sub>, CO & N<sub>2</sub>O in single sample injection and multiple sample injections should not be needed.
- Suitable injector system for manual sample injection via syringe, to be included. All 3 gases analysis should be done in single sample injection.
- All gases controlled should be EPC/PPC/AFC with at least 2 modes of programming including linear velocity mode.
- Pressure range: 0 to 150psi (0 to 1035 kPa)
- Tool free & user replaceable split flow line filter.

**4. Flame Ionization Detector (FID) – 1no.**

- The detector should be capable of detection of trace level of compounds with sensitivity should be at least 1.2 pgC/s for Dodecane, while lower is preferred. Should be able to analyse minimum 1ppm levels of CH<sub>4</sub>
- Temperature range of up to 450°C
- Dynamic range should be at least 10<sup>7</sup>.
- Able to control up to 3 channels of gas, i.e. H<sub>2</sub>, make-up and air (with electronic ON/OFF). The control range are to be for air: 0 – 1000mL/min, H<sub>2</sub>: 0 – 100mL/min, and make-up gas (N<sub>2</sub> or He): 0 – 1000mL/min.
- Must provide fast flame out detection and efficient automatic re-ignition.
- Should be provided with suitable Methanizer for analysis of CO<sub>2</sub> & CO gas at lowest concentration of 1ppm each or lower.

**5. Electron Capture Detector (ECD) – 1no.**

- The detector should be capable of detection of compounds with minimum detected quantity < 4.2 fg/s (Lindane).
- Should be able to analyse minimum 100 ppb levels of N<sub>2</sub>O
- Temperature range up to 400°C
- Dynamic range should be at least 10<sup>5</sup>.
- Radiation source: <sup>63</sup>Ni with radioactivity of 370MBq (or 10mCi), where lower radioactivity is preferred.
- Able to supply a constant flow of make-up gas (N<sub>2</sub> or Ar) for the inertness of ECD chamber with flow control of 0-200mL/min.

Technical  
specification  
prepared  
by  
S. S. S.  
(Inventor)

S. S. S.  
(A.K. Bhate)

**6. Data Management and Acquisition System (PC & Printer)**

- Intel Core i5 processor, 3GHz or better
- 8.0GB DDR RAM or more
- 500GB Hard disk Storage, 128 GB SSD or more
- Atleast 19" LCD monitor
- Windows 10 Professional or better
- At least 1 LAN and 2 USB ports availability
- Keyboard & Mouse
- Laser printer

**7. Software System**

- The software should be an easy-to-use next generation 64-bit software that incorporates the latest Windows 10 technology.
- Equipped with multiple functions like Graphical User Interface, Assistant Bar, Data Explorer, Wizard software and long-filename compatible.
- Flexible Graphical User Interface to display instrument status, show real time plot and change all instrument set points.
- Automatic Retention time adjustment function must come as standard to identify target analyte correctly in the event where retention time has shifted from the originally supposed retention time.
- The software package should allow for the complete control of the GC. Furthermore, the software must include the capability to control up to 4 GCs at any one time, method development and automation, data acquisition, data analysis, generation of custom reports, etc.
- Should have full GLP/GMP support in terms of security, user management, audit-trail and validation support.
- Must have the following data acquisition capabilities:
  - Snapshot function, supports single analysis and batch analysis, Batch Table Wizard, add or insert analyses,
  - Supports extended analysis time, automatic time, automatic data file creation
  - QA/QC (statistical) functions, batch auto-stop function, run user program function, supports pre-run programs, OLE automation compatibility (Batch analysis, etc).
- Must have the following data processing and data analyses functions:
  - Peak integration manipulation, identification (supports multiple relative retention times and grouping)
  - Quantitation (percentage area method, corrected percentage area method, internal standard method, external standard method, standard addition method, index calculation, manual coefficient input)
  - Calibration points and levels (16 levels x 10 points), manual calibration curve creation, column performance calibration, data comparison functions.
- Must have more than 10 types of report items – sample information, environment settings, methods, chromatograms, peak tables, calibration curves, grouping results, diagrams, text, etc.), OLE object compatibility, layout customization and preview functions, summary report.
- Must allow clock-time programming with the ability to automatically start/stop a GC at the user-specified scheduled time.
- Should column conditioning program readily available to start with single click.
- Must be capable of performing detector auto-ranging.
- System check (GC self-diagnosis), status log must be available to allow continuous monitoring of GC in real-time to alert user maintenance needs and instrument problems.

Technical  
Specification  
Prepared by

(Ink/Handwritten)

*[Signature]*  
(AK Photo)

**8. GC Columns, Spares – Consumables & Calibration standard**

- System should be provided with complete set of 4 columns for Greenhouse gases (CO<sub>2</sub>, CO, CH<sub>4</sub> & N<sub>2</sub>O) analysis at ppb /ppm level.
- Set of applicable spares & consumables to be provided for 2 year trouble free operation of system.
- Suitable calibration gas blends of 3 different concentration levels for CH<sub>4</sub>, CO, CO<sub>2</sub> and N<sub>2</sub>O in 1L capacity cylinders with suitable control regulators.

**9. Required Accessories for GC operation**

- Complete Gas supply system with 47L capacity Gas cylinders for each of N<sub>2</sub>, H<sub>2</sub>, Zero Air and Ar(95%)+ CH<sub>4</sub>(5%) gas mixture.
- Dual stage gas regulators and Gas purification panel with complete tubing and gas regulation system for all 4 gases N<sub>2</sub>, H<sub>2</sub>, Zero Air and Ar+CH<sub>4</sub> mixture.
- Branded, high quality 5 KVA Online UPS with atleast 30 min backup.

**10. Installation & Training**

- The supplier must install the complete system and provide training for the users of the instruments at site during installation and commissioning.
- Training should be provided for all the users and at least for 3 days.
- All modules must be GLP compliant.
- A declaration of Conformity certificate must be provided.

**11. Warranty and Annual Maintenance**

- The system should be accompanied with Conformity Certificate.
- Complete support for equipment for at least a period of 24 months from date of installation. This shall include the following at no extra cost:
  - Travel and Labour expenses of Customer Engineer.
  - Service Parts used for repairs.
  - Vendor to have logistic support to ensure that over at least 90% of the service parts are readily available and upkeep delivery within 48 hours.
  - Spare parts should be available for at least 10 years from date of procurement of the instrument.

Technical specifications prepared by - ~~State~~ (Inclined)

The Specifications are generic in nature.

Three company making GC's brochures are attached.

State  
(Avt. Bhatia)  
(Chairperson)  
District  
Purchase  
committee

Shiv Prasad  
Dr. Shiv Prasad  
(member)

Niveta Jain  
Dr. Niveta Jain  
(member)

Ashish  
Dr. Ashish Khandelwal  
member (member secret)