KERALA AGRICULTURAL UNIVERSITY

Regional Agricultural Research Station (SZ), Vellayani

Thiruvananthapuram - 695 522, Kerala

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No.RARS /SZ(7)/2886/17(ii)

Date:17/01/2022

E-TENDER NOTICE

E- Tenders are invited for the supply and installation of following Laboratory Instruments for Regional Agricultural Research Station (Southern Zone), College of Agriculture, Vellayani, as per the technical specifications and the terms and conditions mentioned below.

Specifications:

1. Atomic Absorption Spectrophotometer with Graphite Furnace

A. OPTICS -

1. Spectrometer type Czerny Turner setup, encapsulated, purgeable, focal length 350/389 mm, single-beam and/or double-beam mode
2. Monochromator Holographic grating, rotatable with 1800 lines/mm
3. Slit width 0.2, 0.3, 0.5, 0.8, 1.2 nm should be automatically selected
4. Wavelength range 185 – 900 nm
5. Wavelength reproducibility 0.005 nm
6. Background correction Deuterium background correction by D2 hallow cathode lamp
7. Detector - solid state detector / PMT detector wide range, linear read out 0.1-100%, low noise CSA, 5 V
8. Light source 8-fold hollow cathode lamp (HCL) changer, lamp base compatible with conventional HCL
9. Instrumental sensitivity Flame: (Cu 324) 0.017 mg/L 1 %Abs using a 10 cm burner head (air/acetylene)
10. Graphite furnace: (Pb 283) 0.79 µg/L 1 %Abs (for 20 µL, peak area evaluation)

B. ATOMIZER

1. Dual atomizer concept
2. Design All atomizers mounted in one sample compartment
3. Interchange - Swivel-mounted atomizer interchangeable

C. FLAME

1. Burner Coded Titanium burner head, 10 cm (air/acetylene), 5 cm (air/acetylene and nitrous0oxide/acetylene) with automatic burner head recognition, adjustment of height and angle (0-90°)
2. Nebulizer Adjustable nebulizer with internal Pt/Rh capillary and acid-resistant ceramic impact bead
3. Spray chamber PPS spray chamber with flow spoiler for aqueous and organic solutions

4. Safety and handling Multiple sensors monitoring burner head, siphon system and gas management system (GMS)
5. Automatic ignition and shut down of flame, incl. in case of power outage or gas pressure drop
6. Nebulizer-Burner system with quick-lock for easy replacement

D. GRAPHITE FURNACE

1. Function -Transversely heated graphite furnace atomizer (THGA) by integrated autosampler operation
2. Furnace control Temperature range from 0 °C to 3000 °C, programmable in intervals of 0.5 °C , heating rate up to3000 °C/s, real-time temperature control by QPC sensor, self check system
3. Graphite tube Pyrolytically coated graphite (wall or pin-platform) tubes, self-aligning, sample volume up to 50 µL

Other Terms and conditions

- The bidder should provide a list of users in Government / PSU sector and should have good track record of after sales service. Instrument shall strictly confirm to the specifications with relevant brochure and photograph/images
- **Warranty: 5 years standard warranty from the date of installation and additional 3 years AMC after warranty period so as to ensure 8 years trouble free operation of the equipment. The total price including AMC should be quoted.**
- **The bidder should assure onsite training for investigator and project staff as per requirement during the first 12 months period from the date of installation, at their cost.**

Note: A 1.5 ton AC , 10 KVA UPS, Computer, printer, acetylene, nitrous oxide, air cylinders with safety certificate, gas purification panel, exhaust hood and required tubings should be supplied along with the main system.

- ***The bidder should ensure the supply of basic system with all its accessories and the quoted price should include all these.***
- ***Spare HCLs should also be provided***
- ***The problems if any arising should be attended without any delay (within 3 days).***
- ***Amount should be quoted in Indian rupees***
- ***A durable granite laid table for housing the equipment should also be provided.***

2. CHNS Macro Element Analyzer

1. Fully Automated PC controlled Elemental Analyzer for analyzingsolid and liquid samples
2. Sample weight Range: 0.02 to 1000 mg or better.
3. Detection range: 0 to 100% for all elements with the capability of measuring at least 14 mg absolute Carbon and 10mg absolute Nitrogen in CHNS mode and at least 40 mg Absolute Carbon in CN mode.
4. Measuring range: 0.005% to 100% for all elements. Also mention the absolute measuring range of all elements with proof
5. Standard deviation: ≤0.1% of absolute.
6. Must be equipped with electronic mass flow controller and digital flow sensors for accurate readout of flow.
7. All pressure and flow sensors must be electronic for better accuracy. There should be no analogue pressure gauges. Flow meters on the analyzer must be computer controlled.
8. Furnace System
• Should have two zone furnace system, separate for combustion/reduction with independent temperature control for each furnace in CHNS mode. It should be possible to set different temperature for combustion and reduction.
• Controlled furnace temperature should be 1200^0C or more. Documentary proof needs to be attached.

• Should have possibility to use ceramic/quartz ash finger to handle high inorganic/halogen or fluorine contents sample.
9. Separation System
•Advanced Chromatographic Separation of gases using temperature programmed desorption (TPD) column.
•Complete instrument control over elution process with provision of auto zero of baseline after each element elution
•Full Base line separation of 1:12000 for C:N& C:S
10. Autosampler System
• Electromechanical autosampler system with 80 positions or more.
• It should be possible to remove the autosampler without having to shut down gas supply or evacuate the flow path for loading more samples.
• Zero blank sample injection system without keeping the whole autosampler under inert atmosphere. Helium should not be required for flushing the auto sampler.
Kit for the measurement of fluorinated samples should be quoted.
11. Detector System
• Oxygen intrusion free thermistor technology-based Temperature stabilized TCD detector or IR detector for measurement of C-H-N-S.
12.Gases:
• UHP grade Helium gas cylinder with double stage SS regulator needs to be offered.
• UHP grade Oxygen gas cylinder with double stage SS regulator needs to be offered.
13. Software
• Must be Windows based, compatible with the recent version i.e., windows 10 or newer and should have display of set and actual pressures, flow rates, temperatures, number of samples

analyzed with provision for setting maintenance interval with warning when maintenance needed.

•Windows PC with i5 or better with 8GB Ram and 1TB HDD +Windows 10 OS with 21" monitor needs to be offered

• Should have segmented leak check through software to enable identification of exact position of leaks.

Consumables: To be supplied with consumables enough for 5,000 sample analyses in CHNS mode.

Other Terms and conditions

- The bidder should provide a list of users in Government / PSU sector and should have good track record of after sales service. Instrument shall strictly confirm to the specifications with relevant brochure and photograph/images
- **Warranty: 5 years standard warranty for the whole instrument from the date of installation and additional 3 years AMC after warranty period so as to ensure 8 years trouble free operation of the equipment. 10-year free replacement warranty for the furnace. The total price including AMC should be quoted.**
- **The bidder should assure onsite training for investigator and project staff as per requirement during the first 12 months period from the date of installation, at their cost.**
- **A 1.5 ton AC should also be provided**
- ***The bidder should ensure the supply of basic system with all its accessories and the quoted price should include all these.***
- ***Spare UHP grade Helium gas cylinder with double stage SS regulator and UHP grade Oxygen gas cylinder with double stage SS regulator also needs to be supplied.***
- ***The problems if any arising should be attended without any delay (within 3 days).***
- ***Amount should be quoted in Indian rupees***
- ***A durable granite laid table for housing the equipment should also be provided.***

3. Inductively Coupled Plasma Optical Emission Spectrophotometer

The desired system should have minimum following specifications:

A. Optics / Spectrophotometer

1. Bench top design, ICP-OES system using solid-state detector technology and polychromator/ dual monochromator based optical system with vertical Torch design for handling
2. The system shall be based on Echelle Spectrometer with optical resolution of better than or equal to 0.009 nm at 200 nm.
3. Built-in solid-state detector based on CCD array / CID technology with fastest integration and able to measure around the entire wavelength range. Also, it should have simultaneous background correction with less noise and with better inherent anti-booming capacity.
4. The unit shall have built – in online wavelength calibration at various wave length.

5. The detector shall be provided with built in prettier cooling and operated without AR purge and at less than **-10 °C**.
6. Wave length Range: 167 nm – 840 nm or still lesser at lower range and more at higher range to enable determinations across the entire spectrum, both UV and visible region.
7. The system should be a Vertical dual view Plasma with capability to view the plasma in Axial, Radial as well as Axial and Radial in the same run for maximum flexibility. The system must have capability to optimize the viewing height positioning for best performance. The Radial view position should be fully variable & viewing height setting in both systems should be perfumed through software. Demountable design using single piece quartz tubing for plasma and auxiliary gas flow, corrosion resistant (to acids including HF) plasma torch with a capacity to develop a stable temperature up to 10000 K with duo type plasma configuration for enhanced application flexibility.
8. The system must have provision to start the analysis within ten minutes from first start in a day, with no stabilization time required after 10 minutes for optical stability.
9. List of all elements which can be analysed using the model along with limit of detection of such element in samples digest (digested samples of water, soil, food, plant, water, solids, agriculture products etc.) prepared on matrices of microwave digested diacid system or HF- HCl digested ones must be mentioned. The list should include the elements *viz.*, P, K, Ca, Mg, S, Fe, Zn, Mn, Cu, B, Mo, Co, Ni, Pb, Cd, Cr, As, Al, Se, Hg, Na, Ti, Ba and Si. The other elements which can be determined additionally should be specified.

B. SYSTEM SPECIFICATIONS

1. RF Generator: The basic unit highly efficient RF Generator should be Solid State Free Running RF Generator 40 MHZ/27 MHZ with high efficiency.
2. The power output stability shall be less than 0.1% and it shall have power output of 1500 Watts with Computer control of minimum 1-Watt increments and power output range shall be up to 1450 Watts both for Radial and Axial Plasma views.
3. Plasma view camera to be inbuilt with system to help in method optimization & service assistance for maintenance of torch, injector tip deposition and ensures to sample is injected at proper position.

C. ARGON FLOW CONTROL

1. There should be three independent gas flow control for Plasma, Auxiliary and Nebulizer using software.
2. Nebulizer flow shall have built – in Mass Flow Controller to regulate uptake rates of samples adjustable between 0-2 litres / min increments.
3. The gas flow should be continuously variable for other two Gas lines under Pressure flow control.
4. Total Argon gas Consumption must be less than 12 litre/min for aqueous samples to save the argon including plasma gas, nebulizer gas & Auxiliary gas. It should be clearly mentioned in the brochure/ technical sheet
5. The torch assembly shall be demountable type with alumina injector for corrosion resistant to all acids, including HF. The whole assembly shall be installed on snap in type of cassettes.

6. Hydride assembly with nebulizer also to be supplied along with the instrument for analysis of hydride forming elements.
7. The peristaltic pump supplied with the instrument should have minimum four channels and it should be computer controlled. The flow rate should be between 0.5-5.0 mL/min.
8. System shall be provided with faster rinse pump or device after run.
9. The system must have provision to start the analysis within ten minutes from total shut down with no stabilization time required for Optical Stability.
10. Needed "4 safety gas lines" from place of gas cylinder point near equipment for required length say 25 meters shall be inclusive. If required gas cylinder safety grills must be provided at the site of installation.

D. SAMPLE INTRODUCTION SYSTEM:

1. The system must use a 4 or more channel, variable speed, computer controlled peristaltic pump for sample introduction and tubing must be for aqueous, HF and organic applications.
2. There should be standard self-aspirating cross flow nebulizer assembly for the introduction of the samples even under HF digestion with excellent precision and sensitivity. There should be an automatic system for pre-concentration, online dilution and matrix removal / modifier channel. This may be an inbuilt system or an add on item and that shall be quoted separately as essential component. System must contain a corrosion resistant spray chamber which is unreactive to mineralacids including HF and aqua regia and all organic solvents.
3. There must be corrosion resistant injector which is suitable for HF digested samples, organic solvents and samples containing silicon.
4. There should be facility to analyse common elements and hydride forming elements like As, Hg, Se in high precision mode (vapour phase generation) etc. in a single measurement run (that is in a single method pass). Suitable kit to operationalise and analyse As, Hg, Se with all required materials for that purpose shall be quoted as essential.
5. Auto sampler with 150 positions or more shall be quoted together with the quote and also price should be quoted separately for this.

E. SOFTWARE

1. Software with the feature of plasma view and adjustment of the plasma through software, which controls the interlock safety system. The software must continuously monitor gas pressures, safety interlocks, temperatures inside the atomization source and operation of the atomization source. If any interlock is tripped, the atomization source should be shut down immediately and automatically
2. Latest branded PC available in the market at the time of tender with user friendly operating system and software to operate the equipment with upgradability till warranty and AMC (quoted period) and printer is to be quoted as essential. Training should be given on use of software too. Software support to hydride generation should be inclusive.
3. The system should have best security features and should include the best antivirus covering the period of 5 years from date of installation.

F. ACCESSORIES

1. Cooler system/ chiller for RF Generator shall be supplied along with basic system from Principal supplier and is quoted as essential component for functioning of the equipment. Warranty shall be extended to such system for the said period in the clause.
2. The entire optical system must be and thermo stated and enclosed / sealed using suitable technology, ensuring safety together with computer-controlled interlock system of the equipment. If gas sealed, please quote for sufficient number of gas cartridges.
3. Multi element standard solution for calibration, installation, demonstration and training included in our offer –
4. Argon Gas cylinder with required grade gas (4 Nos.), Nitrogen Cylinder with required grade gas– 2 Regulator each for Argon gas cylinder and Nitrogen gas cylinder. Refilling requirement up to demonstration and handing over of equipment is treated as essential component. Air compressor also to be supplied if required for operation
5. Additional Torch assembly to be provided (4 set) apart from the standard one set.
6. All accessories for the smooth running of the instrument also to be quoted and supplied along with the instrument.
7. Installation and demonstrations are inclusive as essential part of the tender.
8. On site post demonstration Training to staff for 5 days or till satisfaction at: Free of cost.
9. All functional accessories required for the working of the equipment in both modes (dual or radial or axial) at the time of installation demonstration and transfer of equipment shall be supplied by the principal supplier. This shall **also** include sufficient quantity of multi-element standards, special requirements of switch board, special kind of switches or the line rated electrical wiring required to suit the supplied equipment, chiller gas with cylinders, its regulators if any tubing for gases, or a specially designed table to house the equipment with safety etc. This **also** include all items or parts frequently required to be replaced or other material consumable (other than chemicals).
10. Latest configuration PC (minimum i7, 4 GB RAM, 1TB HDD, 19-inch monitor with Win 10 OS), Laser jet black & white printer, Exhaust unit, 20 KV UPS with at least 2 hours back up and fume hood for ICP also to be supplied along with the instrument.

Other Terms and conditions

- The bidder should provide a list of users in Government / PSU sector and should have good track record of after sales service. Instrument shall strictly confirm to the specifications with relevant brochure and photograph/images
- **Warranty: 5 years standard warranty for the whole instrument from the date of installation and additional 3 years AMC after warranty period so as to ensure 8 years trouble free operation of the equipment. The total price including AMC should be quoted.**
- **The bidder should provide a technician at hand for operating the instrument during the first 3 months from the date of installation and assure onsite training for investigator and project staff as per requirement during the first 12 months period from the date of installation, at their cost.**
- **A 1.5 ton AC should also be provided**

- ***The bidder should ensure the supply of basic system with all its accessories and the quoted price should include all these.***
- ***Spare argon and nitrogen gas cylinders and regulators should also be provided***
- ***The problems if any arising should be attended without any delay (within 3 days).***
- ***Amount should be quoted in Indian rupees***
- ***A durable granite laid table for housing the equipment should also be provided.***

Instructions to the bidders

- Bid documents including the Bill of Quantities (BoQ) can be downloaded free of cost from the e- Government Procurement (e-GP) Website www.etenders.kerala.gov.in.
- All bid documents are to be submitted online only and in the designated cover(s)/envelope(s) on above website.
- Price Bid shall be submitted only through online.
    - Rates quoted should be valid upto 31/03/2022.
    - Tenders not stipulating period of firmness of rates and with price variation clause and/or subject to prior sale condition are liable to be rejected.
    - The equipment should be delivered and installed at the expenses of the successful bidder.
    - Rate quoted should be inclusive of all charges such as packing, forwarding, freight, loading/unloading/handling or installation charges and Government duties leviable, if any.
    - The supplier has to make his own arrangement for the ordinary / special tools, machinery, and other consumables required for successful completion of installation and testing.

- **Payment of fee**: Tender submission fee & EMD shall be remitted online during the time of tender submission.
- **Scanned Documents to be submitted online:**
    - Company Data sheets, Brochures & other documents such as relevant technical literatures, drawings, pamphlets containing all the relevant technical specifications of the equipment duly signed by the bidder on each page.
    - Tender form: Each and every pages of the tender form should be attested after reading the conditions provided.
    - Duly filled and signed preliminary agreement of the bid executed in Kerala stamp paper worth Rs.200/-.
        - Bids received online without the scanned copy of preliminary agreement will not be considered.
    - Users list of the equipment, if any.
    - Copy of up-to-date GST registration certificate & PAN of the bidder
    - Supporting document regarding service support.
    - Authorization certificate from the manufacturer if the bidder is a dealer.
    - Valid EMD exemption certificate from the Store Purchase Department, Govt. of Kerala, if the firm claims EMD Exemption.

- Undertaking to the effect that the bidder is not Debarred/ Blacklisted or Banned from any University/ Government Institute / PSU.
- Purchase Order and performance certificate of the quoted model of Equipment from three reputed customers, preferably University/ Government Institute / PSU, if any.

- As per DSIR registration, the University is eligible for relaxation in GST as per Notification No.45/2017 Central Tax (Rate) dated 14.11.17 & Notification No.47/2017 Integrated Tax (Rate) dated 14.11.17. Necessary documents for availing GST exemption will be provided to the successful bidder.
- **Quoting of equipment**: Only the best model fitting the specification must be quoted.
  - Vendors if quoted for lower end model while the same manufacturer is having better model meeting the above tender specifications, the technical committee shall take decision to disqualify.
  - The products should be nationally / internationally branded and CE certified.
  - The bids should be sent only for equipment model available in the market and supplied to a number of customers. Equipment with market standing proven quality and durability only will be entertained.
- **Service**: The firms /companies/ bidder should ensure on-site service support for the equipment.
- The maximum period required for delivery and installation of the article should be mentioned.
- Availability of the spares for the entire instrument for a period of at least 10 years should be ensured.
- If any license or permit is required, Bidders must specify in their tender and also state the authority to whom application is to be made.
- Details required for e-payment (Details of bank account having core banking facility and e- mail address of the bidder) shall be furnished along with the tender.
  - Payments will be made only after satisfactory supply and installation of the equipment.
- **Warranty & AMC: As mentioned in the item wise specification.**
  - If the Supplier, having been notified, fails to rectify the defect(s) within one to two weeks' time, the warranty will be extended by the period for which the instrument lying idle without repair.
  - All parts of the instrument, accessories, and supporting instruments should be covered under the warranty.

- Bidders not accompanied by these details will be rejected.
- Associate Director of Research, RARS (SZ), College of Agriculture, Vellayani shall have no obligation to convey reason for rejection of any bid. It shall be open for Associate Director of Research, Vellayani to reject even the lowest bidder in the interest of the University and no reason need be given thereof.

- The undersigned shall not be responsible for any failure, malfunction or breakdown of the electronic system while downloading or uploading the documents by the Bidder during the e-procurement process.
- On receipt of purchase order, the supplier shall execute an agreement in Kerala stamp paper worth Rs.200/- at own cost and furnish a Performance Security of 5% of the cost. The format of the agreement can be downloaded from the above website.
- Withdrawal from the tender after having accepted or failure to supply within the specified time or according to specifications will entail cancellation of the order and attract legal procedures as per the agreement.
- All subsequent Government orders connected to tenders and any revision in the rates of taxes would also be applicable to this tender.
- In addition to these all other General Conditions annexed in the Store Purchase Manual of Government of Kerala are also applicable to this tender.

Tender details	
Tender inviting Authority	The Associate Director of Research, RARS(SZ), College of Agriculture, Vellayani
Location of supply and installation	Department of Soil Science & Agricultural Chemistry, College of Agriculture, Vellayani, Thiruvananthapuram – 695 522
Date of Publication of Tender	**17/01/2022 5.00 pm**
Last Date and Time of Receipt of Tenders	**07/02/2022 2.00 pm**
Date and Time of Opening of Bid	**08/02/2022 3.00 pm** If the tender opening date happens to be on a holiday or non-working day due to any other valid reason, the tender opening process will be done on the next working day at same time and place.
Earnest money deposit (EMD)	1,20,000/- (Rupees One lakh twenty thousand only)
Tender submission fee	21240/- (inclusive of GST)
Validity Period of Bid	Up to 31/03/2022
Period of supply and installation	Within 21 days from date of issue of supply order
Mode of submission of Bid	Online through the website www.etenders.kerala.gov.in only
Performance Security	5% of the bid amount
Submission of performance security	Within 21 days from date of issue of supply order

Further details on the tender process can be had from the office of Associate Director of Research, RARS(SZ), Vellayani during the office hours between **10.00 am and 5.00 pm. (Mob:9995341071).**

17/1/22

Associate Director of Research

ASSOCIATE DIRECTOR
RARS (S Z)
COLLEGE OF AGRICULTURE, VELLAYANI
THIRUVANANTHAPURAM - 695 522