



**KERALA AGRICULTURAL UNIVERSITY**  
**FARMING SYSTEMS RESEARCH STATION**  
**SADANANDAPURAM, KOTTARAKARA**  
Email: fsrskottarakkara@kau.in

No. FS (3) 1663/22

Date: 16.11.2022

**TENDER NOTICE**

Sealed competitive tenders are invited for the supply of the equipment for the implantation of Establishment of Leaf/ Tissue Analysis Lab at FSRS.

The following equipment is proposing for purchase for the implantation of Establishment of Leaf/ Tissue Analysis Lab at FSRS.

**1. UV spectrophotometer**

Specification as listed below

Sl No	Requirement	Specification
1	Optics	Double beam
2	Light source	Tungsten lamp and Deuterium lamp
3	Wavelength Range	190-1100 nano meter
4	Spectral Bandwidth	2 nano meter
5	Photometric Range	$\pm 3$ Abs
6	Wavelength Accuracy	$\pm 0.1\text{nm}$ @ 656.1nm
7	Stray light	$\leq 0.03\%T$ @ 220nm,360nm
8	Baseline Stability	$\pm 0.0003\text{Abs/h}$ @ 500nm
9	Holder of Cuvette	8 position automatic Sample holder and 1 for reference.
10	Noise	0.0005Abs@ 500nm
11	Baseline flatness	$\pm 0.001\text{Abs}$
12	Display	7-inch display
13	Mode of measurement	Transmittance, Absorbance, Concentration
14	Operating Mode	Photometry, Multi wavelength, Spectrum scan and Time scan
15	Nature of mode	Instrument should Capable of Doing stand alone and pc controlled
16	Accessories required	1 pair Glass cuvette(4ml/10mm), 1 pair Quartz Cuvette(4ml/10mm), Pc Software , Dust cover



## 2. Borosilicate double distillation unit with auto cut off

Specification as listed below

Sl No	Requirement	Specification
1	Distillation water output capacity	2.5 Litre / hour
2	Cooling water consumption	2.5 litre / minute
3	Voltage	230-250 V
4	Total power consumption	5 Kw
5	Conductivity S/*cm	$< 1 \times 10^{-6}$
6	Distillation temp	65-75°C
7	Biological acivity	Pyrogen Free
8	pH	6.9-7
9	Heater	Quartz
10	Boiler	Borosilicate
11	Condenser	Borosilicate
12	Cut off sstem	Automatic cut off

## 3. Soil shaker - Orbital / Reciprocal shaker

Specification as listed below

Sl No	Requirement	Specification
1	Type of motion	Orbital / Reciprocal motion
2	RPM range	50 to 150 RPM
3	Movement	Triple eccentric pin guided system with low jaw coupling
4	Movement material	High Grade Aluminium
5	No of Movement Bearing	6 Nos
6	Motor	Stepper servo motor (Brushless)
7	Drive	Servo drive
8	RPM Indication	Digital Seven Segment LED
9	RPM setting	Using potentiometer
10	Timer Indication	Digital Seven Segment LED
11	Time Range	99.59 Hrs
12	Display of	Set and actual time



13	RPM sensor	Photo electric sensor
14	Tray	Aluminium anodized finish
15	Tray type	Universal
16	Clamps	250ml clamps-25 nos
17	Electrical requirement	230v/50Hz/6A
18	Unit Dimension	19 x 23 x 16 inch
19	Material of construction	MS with powder coated finish
20	Tray accommodation ( flask size)	250ml, 500ml, 1000ml and 2000ml flasks.
21	Tray size	460 x 460 mm

#### 4. SPAD meter

Specification as listed below

Sl No	Requirement	Specification
1	Measuring System	Optical density difference at 2 wavelengths (640nm and 940nm)
2	Display	2 lines x 16 characters
3	Data Memory Capacity	9,554 measurements composed by value and associated species name, time and temperature; 490 names up to 32 characters long (28 characters displayed)
4	Power Source	2 AA (1.5V) batteries
5	Battery Life	5,000-30,000 measures
6	Time to perform a measure	< 1 second
7	Auto power off	after 1 minute of inactivity (4 minutes in USB mode)

#### 5. Automatic Kjeldhals nitrogen distillation unit

Specification as listed below

1	Distillation with inbuilt software and Display	Autosequencing Programmable Microprocessor based Distillation with inbuilt software, Colour Touch Screen high resolution TFT LCD Display
2	steam generator	stainless steel non corrosive steam generator, expansion vessel and water condenser with safety sensors
3	Auto Intelligent run of programmable titration	Auto Intelligent run of programmable steps includes Addition of Boric Acid, Dilution, KMNO <sub>4</sub> Addition for Available Nitrogen, Alkali Addition, Steam Processing, Residue Removal, Process over indication with alarm with inbuilt delay time features, Automatic Titration Connectivity feature for future upgradation, Aspiration of Receiver Residue, Automatic calculation of results. Reagent tanks to be wall mounted each for Alkali, Boric acid and KMNO <sub>4</sub> for easy handling and users visibility
4	suction module of waste residue	The suction module of waste residue should be door mounted for easy serviceability.
6	Calculation and pre programmed data management	Auto calculation of results on feeding of titre value with built in formula includes Preprogrammed data of all parameters including program numbers, Total Nitrogen by direct titration method, Total Nitrogen by back titration method, Protein percentage by direct titration method, Protein percentage by back titration method, Ammonical Nitrogen, further formulas customizable, All above parameters can be viewed directly in touch screen
7	Data portability and connectivity	Data table export to excel, Upgradeable Ethernet connectivity
8	Determination of available nitrogen	Facility to program and control distillate volume for determination of available nitrogen
9	Auto sensing of water	Auto sensing of "NO WATER" condition in condenser & steam generator with alarm & signal to alert user
10	Warning and safety	Enables Automatic monitoring and measuring of high temperature in distillate with alarm & warning signal. Equipment should have transparent view window to watch the distillation process & splash head. , Auto reagent Level Sensor with Alarm for Reagent tanks, Auto door warning indication, Auto tube insert error indication. Auto deactivation of System on error diagnosis, Adjustable steam power, Auto online water saving mechanism. Auto service



		Maintenance alert for periodical checking & maintenance of pumps to avoid repairs
11	Longevity and safety of electronic components	The control panel unit along with inbuilt temperature controller, timer, mother board and SMPS should be isolated in separate control tower and housing to protect electronics from wet chemistry & acid/ alkali process
12	Facility to record and store statistical data	Should have facility to record and store statistical data of Total running cycle of individual pumps, Total running time of pumps, No. Of operation of each pump, Total number of distillation completed with LCD display of all parameters.
13	Nitrogen Reproducibility:	± 0.1% RSD
14	Nitrogen level	0.1 to 200 mg Nitrogen (Min / Max Detection Limit)
15	Nitrogen Recovery	> 99.5%
16	Electrical connection	220-230V single phase 50Hz A.C
17	Other conditions	The company should be reputed with atleast 100 users in Kerala with proof of userlist. The instrument shall strictly confirm to the specifications with relevant brochure & Photograph with images. The company should have proof of atleast 25 installations of long term users using equipments for more than a period of 10 -15 years showing longevity of operations. The bidder must show online demonstration of the quoted system during technical evaluation of the bids. This is an essential requirement

### Terms and conditions

- Tender forms can be downloaded from KAU website (<http://www.kau.in/tender>). Cost of the tender form is 0.25% of the cost of tender rounded to the nearest multiple of 100, subject to a minimum of Rs. 400/- and a maximum of Rs. 1500/- and 18% GST on tender form is applicable. Cost of tender form and 18% GST of tender form should be submitted as two separate DD's.
- 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 items should be delivered at the expenses of the successful bidder.



- Rate quoted should be inclusive of all charges such as packing, forwarding, freight, loading/unloading/handling and Government duties leviable, if any.
- Documents to be submitted:
  - Tender form: Each and every pages of the tender form should be attested after reading the conditions provided.
  - Copy of up-to-date GST registration certificate & PAN of the bidder
  - Authorization certificate if the bidder is a dealer.
  - EMD @ 1% of the quoted amount (Minimum EMD amount Rs. 1500/-) should be submitted as a separate DD drawn in favour of **Professor and Head, Farming Systems Research Station, Kerala Agricultural University, Sadanandapuram**, "payable at **State Bank of India, Pulamon Junction Branch, Kottarakara, Kollam** along with an agreement executed in Kerala stamp paper worth Rs. 200/- should be enclosed with the tender. Valid EMD exemption certificate from the Store Purchase Department, Govt. of Kerala, if the firm is exempted from payment of EMD. The format of the agreement can be downloaded from the website <http://www.kau.in/tender> .
  - Undertaking to the effect that the bidder is not Debarred/Blacklisted or Banned from any University/ Government Institute / PSU.
- The cost of tender form, GST for tender form (18 %), EMD may be drawn by way of three separate DD's in favour of "**Professor and Head, Farming Systems Research Station, Kerala Agricultural University, Sadanandapuram**", payable at **State Bank of India, Pulamon Junction Branch, Kottarakara, Kollam** should be enclosed. .
- The tender along with relevant documents should be sent to "**Professor and Head, Farming Systems Research Station, Kerala Agricultural University, Sadanandapuram, Pin: 691531**" in sealed envelope by registered post/speed post before the date and time of opening of technical bid. Otherwise tender will be strictly rejected without any notice.
  - The sealed envelope containing the hard copy should bear the superscription "**Tender on Supply of Equipments to FSRS, Sadanandapuram**", the cover should contain three separate DD's for tender form, GST for tender form, EMD and the agreement as mentioned above.
  - The tender notice number, name of the items for which the rate is quoted and date of opening of tender should also be mentioned on the top of the envelope.
  - Late tenders will not be accepted.
- **Quoting of Items:** Only the best items the specification must be quoted.
  - The products should be internationally/nationally branded and ISI certified.
- The items should be delivered and installed at the "**Professor and Head, FSRS Sadanandapuram, Sadanandapuram.P.O, Kottarakkara – 691 531**" at your own expenses and any packing, forwarding, freight, loading/unloading/handling will be met by the firm.
- Details required for e-payment (Details of bank account having core banking facility and email address of the bidder) shall be furnished along with the tender.
  - Payments will be made only after the supply is actually verified and taken to stock.
- Tenders not accompanied by these details will be rejected.



- Professor and Head, Farming Systems Research Station, Sadanandapuram shall have no obligation to convey reason for rejection of any bid. It shall be open for Professor and Head, Farming Systems Research Station, Sadanandapuram to reject even the lowest bidder in the interest of the University and no reason need be given therefore.
- On receipt of purchase order from this office, the tenderer should furnish a security deposit of 5% of the cost of the items quoted in the form of term deposit / bank guarantee / demand draft in favour of "Professor and Head, Farming Systems Research Station, Sadanandapuram" payable at State Bank of India, Pulamon Junction Branch, Kottarakara, Kollam (IFSC Code: SBIN0070272).
- Withdrawal from the tender after it is accepted or failure to supply within a specified time or according to specifications will entail cancellation of the order.
- All subsequent Government orders connected to tenders and any revision in the rate so 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.

The tender should reach this office on or before **2.30 pm on 01.12.2022** and will be opened at **3.00 pm** on the same day in the presence of such of the tenderers or their authorized representatives. The tenders received after the stipulated date and time will not be accepted in any circumstances. All terms and conditions prescribed for Government tenders as amended from time to time are applicable in this case also. The under signed has the right to accept or reject any or all tenders without assigning any reason thereof.

Further details can be had from the under signed during the office hours between 10.00 am and 5.00 pm **0474 2663535** and also through KAU web site.



Sd/-  
Professor and Head

  
Administrative Assistant  
Mohammed Faizal. A  
Administrative Assistant  
Farming Systems Research Station  
KAU, Sadanandapuram, Kottarakara