



Kerala Agricultural University

COCONUT RESEARCH STATION
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No.B.1059/16

Dated: 20.02.2017

SHORT TENDER NOTICE

Sealed competitive tenders are invited for the supply of the following Laboratory Instruments:

Sl. No.	Items	Specifications	Qty.
1	Automatic Nitrogen Distillation System	Attached separately	1
2	Spectrophotometer		1
3	Flame Photometer		1
4	Analytical Balance- 0.001g sensitivity		1
5	Bacteriological Incubator		1

The envelopes containing the quotation should bear the superscription “**Tender for the supply of Laboratory Instruments**” and should be addressed to The Professor & Head, Coconut Research Station, Kattachalkuzhi.P.O, Balaramapuram, Thiruvananthapuram, Pin: 695 501, Kerala. Intending tenderers may submit the quotations on their own papers. The tenders will be received up to 3 p.m. on 10/03/2017. Late quotations will not be accepted. The tenders will be opened at 3.30 p.m. on the same day in the presence of the tenderers or their authorized representatives who may be present at that time. The maximum period required for delivery of the articles, warranty of the items, service support, terms of delivery, payment and installation etc. should also be mentioned. Details of the requirements and the conditions governing the supply can be obtained from the office of the undersigned during office hours.

The Professor & Head, Coconut Research Station has the full right to accept or reject the quotations without assigning any reason thereof. The successful tenderer must within a fortnight from the acceptance of his tender furnish 5% of the amount of the contract as security deposit and execute an agreement at his own cost for the satisfactory fulfilment of the contract. Acceptance of tender does not mean confirmed purchase and the supply orders will be placed based on the availability of funds.

Sd/-

PROFESSOR & HEAD

List of Equipment and their Specifications

1. Automatic Distillation System

- **Auto sequencing Microprocessor based PC Compatible Distillation System** with in-built software with 50 Pre-definable User Storage Auto Sequence Programmes
- Automatic sequencing with auto Intelligent run of programmable steps which include Automatic Dilution, Auto KMNO₄ addition, Automatic Alkali Addition, Automatic Steam injection, Process over indication with alarm with delay time features, Automatic Titration Connectivity feature for future upgradation,
- Micro-brilliant distillate control with adjustable sensor,
- Two line Alpha numeric Digital LCD Display,
- Auto sensing of “NO WATER” condition in condenser & steam generator with alarm & signal to alert user.
- Auto deactivation of operation after warning on no water condition in case of user non availability
- Enables Automatic monitoring and measuring of high temperature in distillate with sensor for auto warning signal and safety alarm to alert user to control distillate temperature.
- Continuously measured temperature is displayed digitally.
- Auto door open warning indication, Auto tube insert error indication. Auto deactivation of System on error diagnosis, Adjustable steam power, Auto online water saving mechanism, Auto reagent Level Sensor with Alarm for Reagents, Stainless steel non corrosive steam Generator
- Automatic water level monitoring & Peristaltic pump for reagents addition

2. Spectrophotometer

- Type - Micro controller Based Single beam
- Light source - Tungsten- Halogen Lamp Deuterium Lamp
- Detector - Solid state silicon photodiode
- Display - 20 character 4 line Backlit Alphanumeric LCD
- Measuring mode- 1. Abs
2. % T
3. Concentration by K- factor and multi standards
- Wavelength range - 200 to 1100 nm
- Spectral band width - 1.0 nm
- Wavelength accuracy - ± 0.5 nm
- Absorbance range - -0.04 to 2.5 abs
- Photometric resolution - 0.1%T
0.001Abs
- Printer port - Yes

3. Flame Photometer

Type	Micro control based
Display	4 line 20 character LCD
Measuring elements	Sodium (Na) Potassium (K) Lithium (Li) Calcium (Ca) (four elements can measure in single aspiration)

Standard IF Filter supplied with instrument	Na and K (optional Ca and Li)		
Operating mode	1. Low concentration 2. High Concentration		
Calibration standard	Elements	Minimum	Maximum
	Na	2 ppm	100 ppm
	K	1 ppm	100 ppm
	Li	1 ppm	50 ppm
	Ca	30 ppm	300 ppm
Minimum sample volume	3 ml		
Accuracy	±2 % of FSD ±2 Digit		
Fuel gas and ignition	Domestic LPG and in built ignition system		
Printer Port	Yes		

4. **Electronic balance with 0.001 g sensitivity**

- Capacity : 320 g
- Minimum display : 0.001 g
- Repeatability (standard deviation) : ≤0.001g
- Response time : 1 -1.2 seconds
- Ambient temperature : 5- 40°C/41- 104°F
- Temperature Co-efficient for sensitivity:±5ppm/°C (10-30°C)
- Pan size: 100 x100 mm
- Dimensions (approx.) : 170 W x 240 D x 75 H mm
- Weight (approximately): 2.2 kg
- Power requirements: AC adapter; 90 V- 264 V,-15 % - + 10 %, 50/60 Hz
- Display: LCD

5. **Bacteriological Incubator**

- Three side leafing element
- Memmert pattern Double Wall Chambers
- Inner made of SS and outer of mild steel duly powder coated with 2¹/₂” thick glass wool insulation.
- Thermostat control with accuracy of +/-1 Degree.
- Working temperature of Ambient +5°C to 80° C.
- Heating elements in bottom & sides.
- Adjustable shelves, 3-4 racks.
- Additional glass door.
- Outside MS and Inner Chamber and trays SS. Chambel size. 605x605x905mm Lr. Approx. 325.
- Microprocessor based digital temperature controller instead of thermostat and Air Circulation fan.

Sd/-

PROFESSOR & HEAD

1. Spectrophotometer (Micro controller based single beam)

Specifications

Sl. No	Particulars	Details of specifications
1	Type	Micro controller Based Single beam
2	Light source	Tungsten- Halogen Lamp Deuterium Lamp
3	Detector	Solid state silicon photodiode
4	Display	20 character 4 line Backlit Alphanumeric LCD
5	Measuring mode	1. Abs 2. % T 3. Concentration by K- factor and multi standards
6	Wavelength range	200 to 1100 nm
7	Spectral band width	1.0 nm
8	Wavelength accuracy	± 0.5 nm
9	Absorbance range	-0.04 to 2.5 abs

10	Photometric resolution	0.1 % T 0.001 Abs
11	Printer port	Yes

2. Flame Photometer

Sl. No	Particulars	Details of specifications															
1	Type	Micro control based															
2	Display	4 line 20 character LCD															
3	Measuring elements	Sodium (Na) Potassium (K) Lithium (Li) Calcium (Ca) (four elements can measure in single aspiration)															
4	Standard IF Filter supplied with instrument	Na and K (optional Ca and Li)															
5	Operating mode	3. Low concentration 4. High Concentration															
6	Calibration standard	<table border="1"> <thead> <tr> <th>Elements</th> <th>Minimum</th> <th>Maximum</th> </tr> </thead> <tbody> <tr> <td>Na</td> <td>2 ppm</td> <td>100 ppm</td> </tr> <tr> <td>K</td> <td>1 ppm</td> <td>100 ppm</td> </tr> <tr> <td>Li</td> <td>1 ppm</td> <td>50 ppm</td> </tr> <tr> <td>Ca</td> <td>30 ppm</td> <td>300 ppm</td> </tr> </tbody> </table>	Elements	Minimum	Maximum	Na	2 ppm	100 ppm	K	1 ppm	100 ppm	Li	1 ppm	50 ppm	Ca	30 ppm	300 ppm
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Na	2 ppm	100 ppm															
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Ca	30 ppm	300 ppm															
7	Minimum sample volume	3 ml															
8	Accuracy	±2 % of FSD ±2 Digit															
9	Fuel gas and ignition	Domestic LPG and in built ignition system															
10	Printer Port	Yes															

5. Conductivity meter

Sl. No.	Particulars	Detailed specifications
1	Type	Automatic micro controller based with temperature compensation
2	Measuring mode	Conductivity, temperature
3	Conductivity	0.1 μ S to 200 mS
4	TDS	0.1 ppm to 200 ppt
5	Conductivity	± 1 % of FS ±1 Digit
6	Display	7 digit 7 segment LED
7	Accessories	Conductivity cell with cell constant 1 and 0.1 Temperature, Probe stand and clamp
8	Printer	Yes

6. pH meter

Sl. No	Particulars	Detailed specifications
1	Type	Automatic micro controller based
2	Measuring mode	pH, milli Volt (mv), temperature
3	Accuracy	±0.002 pH, ±1 digit
4	Standard Calibration	3 -point calibration
5	Calibration Back up	Yes
6	Milli Volt (mv) Accuracy	±0.5 mv ±1 digit
7	Accessories	pH electrode Temperature probe

5 .Automatic Digestion System :

- Twelve Place 250 ml capacity PC Compatible Block Digestion System with Casted Aluminium Alloy Heaters
- Direct USB Port for PC/Laptop Connectivity, TFT Graphic Touch Screen Display.
- Unique wireless mouse to operate touch screen without PC at a distance of 2 mtrs from equipment.
- Data logging with real time clock, Memory stick for data storage with separate port in mother board,
- 70 programs & 12 sequence steps, PC chart software, Live graphical representation of time/temp. gradient
- Live Schematic process flow feature with display of various stages with facility to have print options
- Software enables multiple unit monitoring with multi user login feature
- Inbuilt software program for micronutrient, macro nutrient, trace element, diacid and triacid analysis.
- Upgradeable to Remote Control Module for wireless data monitoring, control and transfer to PC at a distance of 20 mtrs from equipment
- Upgradeable to Autolift Module
- Electrical Requirement: 230 V, 50 Hz AC Mains.

6 Automatic Distillation System

- **Autosequencing Microprocessor based PC Compatible Distillation System** with in-built software with 50 Predefinable User Storage Auto Sequence Programmes
- Automatic sequencing with auto Intelligent run of programmable steps which include Automatic Dilution, Auto KMNO₄ addition, Automatic Alkali Addition, Automatic Steam injection, Process over indication with alarm with delay time features, Automatic Titration Connectivity feature for future upgradation,
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- Automatic water level monitoring & Peristaltic pump for reagents addition

7. Electronic balance with 0.1 g sensitivity

1. Capacity : 12 kg
2. Minimum display: 0.1 g
3. Repeatability : ≤ 0.1 g
4. Linearity ± 0.2 g
5. Stability time: 2.0 -2.5 seconds
6. Working temperature: 5 to 40° C
7. Temperature Co-efficient for sensitivity: (10- 30°C): ± 3

8. Pan size (mm) approx. : 345 (W) x 250 (H)
9. Main body dimensions (mm) approx. 360 (W) x 125 (D) x 125 (H)
10. Main body weight Kg (approximately) : 16.5 kg
11. Display : LCD
12. Input/Output terminals : RS- 232C RS/I-O
13. Unit available : g, Kg
14. Calibration : With built in weight

8. Electronic balance with 0.001 g sensitivity

1. Capacity : 320 g
2. Minimum display : 0.001 g
3. Repeatability (standard deviation) : $\leq 0.001g$
4. Response time : 1 -1.2 seconds
5. Ambient temperature : 5- 40°C/41- 104°F
6. Temperature Co-efficient for sensitivity: $\pm 5ppm/^{\circ}C$ (10-30°C)
7. Pan size: 100 x100 mm
8. Dimensions (approx.) : 170 W x 240 D x 75 H mm
9. Weight (approximately): 2.2 kg
10. Power requirements: AC adapter; 90 V- 264 V, -15 % - + 10 %, 50/60 Hz
11. Display: LCD