



केंद्रीय रेशम अनुसंधान एवं प्रशिक्षण संस्थान
केंद्रीय रेशम बोर्ड वस्त्र मंत्रालय भारत सरकार
बहरमपुर -७४२१०१ मुर्शिदाबाद जिला (पश्चिम बंगाल)
Central Sericultural Research & Training Institute
CENTRAL SILK BOARD Ministry of Textiles Govt. of India
Berhampore-742101, Murshidabad, West Bengal, India



CSB/CSRTI/BER/STORE(Dead Stock)/2023-2024/ ~~652~~ 6052

Date : 25.1.2024

TENDER NOTICE

Through CPP/e-procurement

**Sub : Purchase of PORTABLE PHOTOSYNTHESIS SYSTEM
(IRGA : Infra Fred Gas Analyzer) – reg.**

It is to inform that this office is interested to purchase 1 (one) no. **PORTABLE PHOTOSYNTHESIS SYSTEM (IRGA : Infra Fred Gas Analyzer)** for measuring Plant photosynthesis of mulberry plants. Detailed specification is enclosed herewith.

As such, interested parties are invited to submit their quotation under 2 packet Bid system with separate sealed Technical and Financial quotes kept in 1 packet alongwith 2% EMD of Gross total quoted rate through demand draft in favour of “DIRECTOR, CENTRAL SERICULTURAL RESEARCH & TRAINING INSTITUTE” payable at BERHAMPORE (W.B.), Central Bank of India IFSC No.CBIN0284988 and Account no.2086199181” to this office address : Director, CSR&TI, Central Silk Board, Near BPC Rly. Station, chuanpur, Berhampore -742101 (WB) on or before **24.2.2024** through Regd./Speed post which will be opened on 26.2.2024 at 3.00 pm.

In this connection Term & Conditions are as under :

- 1) 2% **EMD** of Gross total quoted rate through demand draft in favour of “DIRECTOR,CENTRAL SERICULTURAL RESEARCH & TRAINING INSTITUTE” payable at BERHAMPORE (W.B.) Central Bank of India IFSC No.CBIN0284988 and Account no.2086199181” must be enclosed with quotation.
- 2) L1 party should deposit 5% of the total cost as **SMD** with in 10 days of receipt of supply order.
- 3) EMD will be returned with in 1 month after opening quotation to concerned parties.
- 4) SMD will be returned after completion of Guarantee/warrantee period after installation of equipment.
- 5) EMD & SMD will not carry any interest.
- 6) Quotation of the above equipment should included charges for **installation, testing & commissioning & Training to Scientist**
- 7) Quotation should include all the **admissible taxes**.
- 8) Photocopies of GST registration & PAN must be enclosed alongwith Quotation.
- 9) This office will deduct TDS on GST @ 2% for deposition to concerned GST account on the final bill payment.
- 10) Income tax is also to be deducted & deposited as per rule.
- 11) Catalog of the equipment must be enclosed alongwith Quotation.
- 12)List of Service station in West Bengal (India) included contract address, valid email and mobile no. must be enclosed with quotation.
- 13)90% Payment of the above equipment should be made by this office after found satisfactorily installation and function of the equipment with in 3 month & balance 10% after completing Guarantee/warrantee period

Conted...2/-



E-Mail: csrtiber.csb@nic.in/csrtiber@gmail.com
Director (Mobile): 9980080491 Website: www.csrtiber.res.in





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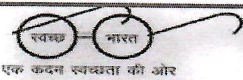


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- 14)The instrument should be complete in all respects, so as to work stand alone under the Indian Power Supply (230 V) condition.
15)In case of any doubt or dispute the decision of the Director, CSR&TI Berhampore shall be final and binding on all the bidders.

[Handwritten Signature]
25.1.24
DIRECTOR

Encl:As above.



E-Mail: csrtiber.csb@nic.in/csrtiber@gmail.com
Director (Mobile): 9980080491 Website: www.csrtiber.res.in



Portable Photosynthesis System (IRGA): Detailed Specifications

A complete gas exchange system which is ideal for basic lab or field measurements with natural or controlled light.

CO₂ Gas Analyzer

- **Type:** Absolute non-dispersive infrared gas analyzer
- **Measurement Range:** 0 – 3100 $\mu\text{mol mol}^{-1}$
- **Precision (signal noise) RMS 4-second signal averaging at 10 $\mu\text{mol mol}^{-1}$:** $\leq 0.1 \mu\text{mol mol}^{-1}$
- **Accuracy:** Within 1% of reading at 200 $\mu\text{mol mol}^{-1}$ or above, $\pm 2 \mu\text{mol mol}^{-1}$ at $< 200 \mu\text{mol mol}^{-1}$
- **Orientation Sensitivity:** $\leq \pm 1 \mu\text{mol mol}^{-1}$ variation at 400 $\mu\text{mol mol}^{-1}$ from any orientation

H₂O Gas Analyzer

- **Type:** Absolute non-dispersive infrared gas analyzer
- **Measurement Range:** 0 – 75 mmol mol^{-1}
- **Precision (signal noise) RMS 4-second signal averaging at 10 mmol mol^{-1} :** $\leq 0.01 \text{mmol mol}^{-1}$
- **Accuracy:** Within 1.5% of reading at $> 5 \text{mmol mol}^{-1}$; $\pm 0.08 \text{mmol mol}^{-1}$ at $< 5 \text{mmol mol}^{-1}$

Temperatures

- **Operating Temperature Range:** 0 – 50 °C
- **Storage Temperature Range:** -20 – 60 °C
- **Temperature Control Range:**
 - **Leaf Temperature:** ± 10 °C from ambient
 - **Setpoint Resolution:** 0.1 °C
- **Chamber exhaust air temperature and temperature control block:**
 - **Type:** Thermistor
 - **Range:** -10 – 60 °C
 - **Accuracy:** ± 0.15 °C
- **Leaf temperature sensor:**
 - **Type:** Type E fine-wire thermocouple
 - **Sensitivity Range:** -10 – 60 °C
 - **Accuracy:** $\leq \pm 0.5$ °C total; ± 0.2 °C cold junction reference; ± 0.3 °C thermocouple when within ± 10 °C of cold junction temperature

Communication

- **RJ-45 Ethernet; IP/TCP for networks and computers:** 1
- **Head Connections:** 2
- **Accessory Connections:** 2

Air Flow Rates

- **Bulk Flow Rate:** 680 – 1700 $\mu\text{mol s}^{-1}$ at SATP1
- **Leaf Chamber Flow Rate:** 0 – 1400 $\mu\text{mol s}^{-1}$ at SATP

Pressure

- **Console Pressure Sensor:**
 - **Operating Range:** 50 – 110 kPa
 - **Accuracy:** ± 0.4 kPa
 - **Resolution:** 1.5 Pa typical
 - **Signal Noise:** ≤ 0.004 kPa peak-to-peak with 4-second signal averaging
- **Chamber Pressure Sensor:**
 - **Range:** -2 – 2 kPa
 - **Resolution:** < 1 Pa typical
 - **Signal Noise:** 1 Pa peak-to-peak with 4-second signal averaging
 - **Setpoint Resolution:** 1.0 Pa
 - **Control Range:** 0 – 0.1 kPa (dependent on flow rate through the chamber)

Batteries

- **Weight:** 0.435 kg
- **Capacity:** 6800 mAh
- **Type:** Lithium Ion
- **Storage:** -20 – 60 °C; $\leq 80\%$ RH

CO₂ Control

- **CO₂ Control Range:** 0 – > 2000 $\mu\text{mol mol}^{-1}$ (with pump set to low; dependent on bulk flow rate)
- **CO₂ Cartridge Type:** 8 gram
- **Cartridge Lifetime:** > 8 hours after puncture (dependent on setpoint)
- **CO₂ Scrubber:** Soda lime

H₂O Control

- **H₂O Control Range:** 0 – 90% RH (noncondensing)
- **Humidifier Substrate:** Nafion
- **Desiccant:** Silica Gel (BASF Sorbead[®] Orange CHAMELEON[®])

Light Measurement

- **Chamber and light source PAR sensors:**
 - **Sensitivity Range:** 0 – 3000 $\mu\text{mol m}^{-2} \text{s}^{-1}$
 - **Resolution:** < 1 $\mu\text{mol m}^{-2} \text{s}^{-1}$
 - **Calibration Accuracy:** $\pm 5\%$ of reading; Traceable to the U.S. National Institute of Technology (NIST)
- **External LI-190R PAR Sensor:**
 - **Detector:** Silicon photodiode
 - **Sensitivity:** 5 – 10 μA per 1000 $\mu\text{mol s}^{-1} \text{m}^{-2}$
 - **Calibration Accuracy:** $\pm 5\%$ of reading; Traceable to NIST

Console

- **Processor:** Arm[®] Cortex[™] A9 Quad Core running at 1 GHz
- **Memory:** 2 GB RAM; 8 GB Flash memory
- **Display:** Sunlight-readable TFT LCD with capacitive touch screen
- **Resolution:** 1024 x 600 pixels

- **Dimensions:** 26 cm diagonally
- **Size:** 18.5 x 27.5 x 21 cm; (D x W x H)
- **Weight:** 6.1 kg
- **Power Requirements:** 12 – 18 VDC or 24 VDC

Head

- **Size with 3x3 cm Clear Leaf Chamber:** 37 x 11.5 x 21.6 cm (L x W x H)
- **Weight:** 2.15 kg without chamber
- **Display Resolution:** 128 x 128 pixels
- **Display Dimensions:** 3.15 cm corner-to-corner
- **Head Inputs**
 - **Leaf Temperature Thermocouple:** 2
 - **LI-190R Light Sensor:** 1
- **Head Light Source connections:** 1

Clear-top Chamber

- **Maximum Leaf Area:** 9 cm²
- **Size:** 15.4 x 11.5 x 5.9 cm (L x W x H)
- **Weight:** 0.3 kg

Small Light Source

- **Total Output Range:** 0 – >2000 $\mu\text{mol m}^{-2} \text{s}^{-1}$ at 25 °C
- **Blue Output Range:** 0 – >400 $\mu\text{mol m}^{-2} \text{s}^{-1}$ at 25 °C
- **Red Output Range:** 0 – >1600 $\mu\text{mol m}^{-2} \text{s}^{-1}$ at 25 °C
- **Red Peak Wavelength:** 660 nm
- **Blue Peak Wavelength:** 453 nm
- **Uniformity:**
 - $\pm 10\%$ Over 90% of the aperture with white top gasket, typically
 - $\pm 10\%$ Over 77% of the aperture with black gasket, typically
- **Power Consumption:** 2000 $\mu\text{mol m}^{-2} \text{s}^{-1}$ <5 watts
- **Operating Temperature Range:** 0 – 50 °C
- **Size:** 6.6 x 5.9 x 5.8 cm (L x W x H)
- **Weight:** 0.21 kg

Instrument Case, Accessory Case, Tripod and Panhead Mount, Carrying Harness, Spare Kit :For easily carrying out the activities under lab & field conditions

Installation: Installation should be done by the seller.

Training: The bidder must be competent to provide training to handle the instrument and to troubleshoot during use. Onsite training after installation should be given.

Warranty: 1-year comprehensive service and spare parts warranty, free of cost.

Future Feasibilities: The instrument should have facility for future attachment of soil CO₂ flux chamber

The instrument should be compatible with Indian Electricity Supply Conditions (230 V).