

**Central Soil Salinity Research Institute**  
Zarifa Farm, Kachhwa Road,  
Karnal- 132 001 (Haryana) India  
Telephones:0184-2230078, 0184-2291119, 2291519, 2291218  
Fax : 91-184-2290480 E-mail [director@cssri.ernet.in](mailto:director@cssri.ernet.in)

**TENDER NOTICE NO.9/2011**

The Director, CSSRI, Karnal on behalf of Secretary, ICAR invites sealed tenders from reputed dealers/contractors for the under mentioned items for CSSRI, Karnal.

Sr. No	Name of item	Place of Delivery	EMD Amount Rs.
1.	PLATFORM SHAKER WITH ROTARY MOTION	CSSRI, Karnal	12,000/-
2.	WARM SHAKER	-do-	12,000/-
3.	ELECTROPHORTIC SYSTEM ALONGWITH ACCESSORIES	-do-	10,000/-
4.	DILUTOR	-do-	10,000/-
5.	FLAME PHOTO METER (2 nos.)	-do-	20,000/- for both
6.	POWER GENERATOR SET (40 KVA)	-do-	15,000/-
7.	SAMPLE DIGESTION SYSTEM	-do-	10,000/-
8.	MODULATED FLUROMETER ALONG WITH ACCESSORIES	-do-	25,000/-
9.	DOUBLE DESTILATION PLANT	-do-	2,500/-
10.	ANALOG TYPE TENSILE STRENGTH TESTER	-do-	5,000/-
11.	GULEPH PERMEAMETER	-do-	2,500/-
12.	AUTOCLAVE	-do-	5,000/-
13.	LASER LEVELLER	-do-	15,000/-
14.	INFRARED GAS ANALYZER OR PORTABLE SYNTHESIS SYSTEM	-do-	50,000/-
15.	REPAIR OF EXISTING GLASS HOUSE	-do-	35,000/-
16.	WET SIEVING APPARATUS	CSSRI,RES. STATION CANNING TOWN (W.B)	10,000/-
17.	SIDIMENT SAMPLING EQUIPMENT	-do-	5,000/-
18.	SPECIFIC ION METER WITH ELECTRODES	-do-	20,000/-
19.	PRESSURE PLATE APPARATUS	CSSRI, RRS, STATION, BHARUCH (GUJARAT)	25,000/-
20.	PRESSURE CHAMBER	-do-	20,000/-
21.	CHLORIDE METER	-do-	5,000/-
22.	PORTABLE EC/pH METER	-do-	5,000/-
23.	HYDRAULIC CONDUCTIVITY MEASUREMENT APPARATUS (PERMEAMETER)	-do-	5,000/-
24.	SPECTRONIC 20 COLORIMETER	-do-	10,000/-
25.	WATER PURIFICATION SYSTEM	-do-	10,000/-

**GENERAL TERMS & CONDITIONS:**

- Blank Tender forms for the above items alongwith details can be obtained from the office of the Sr. Administrative Officer, CSSRI, Karnal on any working day between **10.30 A.M. to 4.00 P.M.** from the date of publication of tender notice at a cost of Rs.500/- for each item till **03.01.2012 upto 4.00 P.M.** on payment of cash and by post Rs.550/- in shape of demand draft in favour of ICAR-UNIT-CSSRI, KARNAL at least one week earlier from above said date.
- The tender form may also be downloaded from this Institute web site [www.cssri.org](http://www.cssri.org). The cost of down loaded form must be accompanied with Tender of Rs.500/- for each separate item in the shape of DD in favour of ICAR-UNIT-CSSRI, KARNAL. The DD/Ch. of Rs.500/- cost of tender form should be placed separately. Other terms & conditions provided in the tender forms.
- The tender will be received/deposited along with EMD on or before **04.01.2012 upto 10.30 A.M.** and tender box will be sealed, thereafter no tender will be received.
- The tender must be put in tender box kept in the OIC, Security office, CSSRI, Karnal.
- The tender will be opened at **11.00 A.M.** on **04.01.2012** in the presence of the tenderers or their representative as per terms & conditions in the tender document.
- The Director, CSSRI, Karnal reserves right to accept or reject any or all the tenders without assigning any reasons. The tenders received late and without any earnest money will out rightly be rejected.
- Other terms & conditions provided in the tender forms.
- Cost of Tender as mentioned in Sr. No. 1 is non refundable in any case.**

Sr. Administrative Officer  
Tele: 0184-229218, 2291219

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**TENDER APPLICATION FORM MUST BE SUBMITTED IN A SEALED ENVELOPE FOR THE ITEMS QUOTED. RATES ARE TO BE QUOTED SEPARATE FOR EACH ITEM.**

**Tender No.( 9/2011) \_\_\_\_\_ Dated: ..... 2011**

Sealed Tenders for supply of the above item is invited on behalf of the Indian Council of Agriculture Research, as per schedule/ specification attached.

**Items mentioned as per enclosed specification.**

**PREPARATION OF TENDER** : The tender documents comprising of the tender form and the schedule referred to therein are provided herewith. Any form of overwriting or use of more than one ink of the tender will disqualify the tender and such tenders are liable to be ignored. Also, a tender is liable to be ignored if complete information as required therein is not filled in. Rates should be quoted in words also. Rates have to be quoted separate for each item. The tender no. and due date should invariably be super subscribed on the envelop cover.

**Submission of Proposals:** The proposals shall be submitted in two parts, viz., Technical and Financial and should follow the conditions i.e. Technical and Financial proposals must be submitted in two separate sealed envelopes (**with respective marking in bold letters**). The **first envelope marked Technical proposal** should include the technical specifications. The first envelope should not contain any cost information whatsoever. The second envelope marked **FINANCIAL PROPOSAL** must also be sealed with sealing wax and should contain the detailed price offer for the equipment's. Both the sealed envelopes should again be placed in a bigger sealed cover, which will be received in the office of Director, CSSRI, Karnal upto **10.30 A.M. on 04.01.2012**. The proposals will be opened by the authorized committee constituted by the Director in the presence of tenderers or their representative at **11.00 A.M. on 04.01.2012**. A two-stage procedure will be adopted in evaluating the proposals (i) a technical evaluation, which will be carried out prior to opening any financial proposal (ii) financial evaluation. The tender competing in technical evaluation will only be considered for financial evaluations. The price envelopes of others will not be considered. At second stage, financial bids of only technically acceptable offers should be opened for further evaluation and ranking before awarding the contract. The financial proposal shall be opened in the presence of the tenderers or their representatives who choose to attend. The prior information in this regard will be given to the qualified tenderers.

**DELIVERY OF TENDER:** All tenders should be addressed to the **Director, CSSRI, Karnal-132 001** and should ordinarily be deposited in the tender box kept in the office of OIC, Security, CSSRI, Karnal for the purpose. Tenders can also be sent by post but this will be at the risk and responsibility of the tenderer themselves. However, such tenders as are sent by post, duly sealed, subscribed and addressed as indicated above should be made to be delivered to **the Director, CSSRI, Karnal**. No responsibility whatsoever will be accepted with regard to postal delays or for wrong delivery of the tenders sent by post.

**LATEST HOUR FOR RECEIPT AND OPENING OF TENDERS:** As specified to the schedule to tender, the tenders must reach this office on or before **04.01.2012 by 10.30 A.M.** Only technical tenders will be **opened at 11.00 A.M. on 04.01.2012** as mentioned above in the presence of the tenderers who may choose to be present personally or through representative duly authorized in this behalf. **Late tenders i.e. tenders received after the specified hours and dates will not be considered at all.**

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**PERIOD FOR WHICH THE OFFER WILL REMAIN OPEN/ CONTRACT PERIOD** : As specified in the schedule to tender the tender shall remain open for acceptance-**upto 120 days from** the date of opening. After the acceptance of the tenders, the successful tenderers will have to execute every supply/work order.

**EARNEST MONEY**: Each tender must be accompanied with an **earnest money with technical specification** in respect of each item as mentioned against in the Tender Notice without which no tender shall be considered. Earnest money should be furnished in the form of Bank Draft/FDR in favour of the **ICAR Unit, CSSRI, Karnal** preferably drawn on the SBI, **Karnal**. Bid Security/EMD of the unsuccessful bidders should be returned to them at the earliest on or before the expiry of the final bid validity.

**PERFORMANCE SECURITY**: (i) To ensure due performance of the contract, performance security is to be obtained from successful bidder equivalent to **10%** of the total value of contract by Demand Draft/Fixed Deposit in favour of the ICAR Unit, CSSRI, Karnal. (ii) **Performance Security should remain valid for a period of sixty days beyond the date of completion of all contractual obligations of the supplier including warranty obligations.** (iii) Bid Security should be refunded to the successful bidder on receipt of performance security. The Institute will pay no interest for the deposit. The supply/work is to be completed in the stipulated period as will be given in the supply/work award letter otherwise will attract penalty clause as in para 13

**PRICES AND DELIVERY** : As given in the schedule to tender, the prices quoted must be net per unit, inclusive of all charges. The supplier may charge full Sale Tax/Vat etc. as no form 'C' & 'D' will be issued. No request will be considered on later stage regarding any amendment etc. The successful bidder is to supply the material immediately after receiving the work award letter. No price variation will be admissible beyond the original scheduled delivery date. **The delivery of the material will be made at the destination mentioned in the tender invitation letter and in work award letter. In case of imported item, the supplier/their Indian Agent will be responsible for delivery of the material from the place of discharge of material.**

**PAYMENT** : The payment to the supplier/manufacturer (in India) will be made only on bill basis after receiving the material in goods condition & after satisfactory installation/commissioning. The payment in respect of Maintenance contract may be released in installments on quarterly or half yearly basis.

**IMPORTED EQUIPMENT**: In case of imported equipment, the **Performa Invoice of the manufacturer should be enclosed alongwith complete terms & Conditions.** The terms of payment in case of imported equipment will be Letter of Credit. The price of goods shall be compared on **CIF/ FOB basis** , as and if specified in the schedule of requirements. Any element of cost taxes duties, levies etc. not specifically indicated in the bid shall not be paid by the purchaser. **The price must be quoted FOR destination CSSRI, Karnal or for its regional stations Canning, Bharuch and Lucknow mentioned in the tender Notice for which the equipment is required. The CSSRI, Karnal will provide necessary documents for the release of consignment from custom. All the liability and responsibility for supply of equipment at destination will be of the Indian Dealer/Indian Agent of the supplier they will be held responsible for any faulty supply of the material and will also responsible for exchange of the equipment etc. In case of any fault/defective supply, the Indian dealer/agent will directly responsible for change of material and CSSIR, Karnal will not borne any expenditure.**

- a. **L.C. will be opened for 100% amount and shall be bifurcated in the following manner:**
- (i) L.C. for 80% of the cost of material, which shall be released by the bank on proof of dispatch of goods in good condition etc.
  - (ii) The 20% amount against L.C. of the cost of material, shall be released by bank on Satisfactory installation and commissioning of the equipment on subsequent intimation by the office to the bank to this effect.

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**Warranty:** The warranty clause should be clear. Any defective goods or to replace or repair by the supplier without charges with similar goods free from defect. Any goods repaired or replaced by the supplier shall be delivered at the buyer's premises without costs to the buyer. The warranty shall not be less than the period of 12 months from the date of satisfactorily installation/commissioning. The warranty condition must be for complete equipments and must covered both consumable and non-consumable items. In case, any item, which not covering warranty must be indicated clearly with detail justification/reason.

**CONDITIONS OF CONTRACT:** The successful bidder/contractor to whom order will be placed has to supply the material within stipulated period given in the terms and conditions for timely delivery of the goods. The successful bidder has to enter into contract before awarding the order as per GFR. If any time during the performance of the contract, the supplier encounters conditions hindering timely delivery of the goods, the supplier shall promptly inform the purchaser in writing the fact of the delay and the likely duration of the same. After receipt of supplier's communication, the purchaser shall decide as to whether to cancel the contract for the un-supplied portion after the existing delivery period, or to extend the delivery period suitably by issuing an amendment to the contract. If the supplier fails to deliver the goods and / or perform the services within the contractual delivery period for reasons other than circumstances beyond supplier's control (which will be determined by the purchaser) and the purchaser extends the delivery period, the purchaser will also deduct from the contract price, as liquidated damages, a sum equivalent to 0.5% (half percent) of the delivered price of the delayed goods or unperformed services for each week of delay or part thereof until actual delivery or performance. The maximum limit of such deduction will, however, be 10% (ten percent) of the contract price of the delayed goods or services.

Further, during such delayed period of supply and / or performance, the supplier shall not be entitled to any increase in price and cost, whatsoever, on any ground. However, the purchaser shall be entitled to the benefit of any decrease in price and cost on any ground, whatsoever, of the goods & services, supplied during the period of delay.

**Maintenance Contract:** The equipment or machinery is maintained free of charge by the supplier during warranty period or such other extended periods as the contract terms may provide and the paid maintenance should commence only thereafter. The manufacturer/dealer has to ensure that the spare parts etc. of the equipment/machinery will be supplied without any interruption minimum period of five years after expiry of the warranty period, the clear terms in this regard may be submitted. Rates of AMC after warranty for 2-5 years may be provided.

**AUTHORIZATION CERTIFICATE:** *In case the firm is quoting rate on behalf of manufacturer as Indian Agent, the Authorization Certificate must be enclosed from the Principle/manufacturer.*

**USERS LISTS/Catalogue/Brochure:** Firm will provide users list of equipment with address E-Mail, Fax and Phone number and also catalogue/brochure without which tender is liable to be rejected.

**17. Dispute Resolution Mechanism:** If any dispute or difference arises between the purchaser and the supplier relating to any matter connected with the contract, the parties shall make every effort to resolve the same amicably by mutual discussions. However, if the parties fail to resolve the dispute or difference by such mutual discussion within 30 days, either the purchaser or the supplier may give notice to the other party of its intention to refer the same to arbitration. The arbitration shall be conducted by a sole arbitrator, who will be appointed by the Secretary, ICAR and the procedure to be followed in this respect will be as per the Indian Arbitration and conciliation Act 1996. The venue of the arbitration shall be the place from where the contract is issued.

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**18. Evaluation of Bids Received:** The Institute should evaluate, segregate, rank the responsive Bids and select the successful bidder for placement of the contract. Without required information/supporting documents as mentioned in Tender Notice as well in the tender form, the bid will be rejected in straight way.

**REGISTRATION CERTIFICATE:** Every tender must be accompanied by a certificate as under Photo state copy, duly attested that the firm is registered under company act./with DGS&D/CPO etc.

**20. INCOME TAX :** Photostat copy of the latest income tax clearance certificate and a copy of PAN No. may be provided.

**21. CUSTOM DUTY & EXCISE DUTY EXEMPTION:** Ours Institute is registered with the Department of Scientific & Industrial Research (DSIR) for purposes of availing customs duty exemption in terms of Government Notification No. 51/96-Customs dated 23 July, 1996 and central excise duty exemption in terms of Government Notification No. 10/97-Central Excise dated 1 March, 1997. The certificates will be made available.

**22. It is compulsory to mention your Bank Account No. and Bank name for smooth transition of payment**

**Director ,CSSRI, Karnal** reserves the right to cancel any tender without assigning any reason thereof.

**NOTE : *Quantity mentioned in the tender notice is approximate and liable To change at the discretion of the Director, CSSRI, Karnal***

Sr. Administrative Officer

### **1. SPECIFICATION OF PLATFORM SHAKER WITH ROTARY MOTION**

- Plat form dimensions: 500 mm x 400 mm approximately
- 24 to 36 holding for 125 ml conical flask with silicon rubber flask holder and flexibility to hold 250/500/1000 ml conical flask with gradual lesser no of holding respectively.
- Maintenance free brushless motor cooled by a fan for long life.
- Dynamically, triple eccentric drive for long life, smooth and quite low noise operation.
- Shaking speed 40 to 400 RPM with digital display.
- Digital RPM setting and display in 1 RPM increments.
- In case of power failure, the timer must count from where it last stopped after resumes running again.
- Timer setting and display of about 100 hour with increment of 1 minute up and down.

### **2. SPECIFICATION FOR WARM SHAKER**

Rotation capacity - min 20 to 100 RPM and increased the one RPM by one step.

Size of the top surface (L X W) – min 75 x 75 cm

Top of the shaker should be plain

Digital display of RPM

It should have the capacity to hold min 5 kg of weight

### **3. SPECIFICATION FOR ELECTROPHORETIC SYSTEM ALONG WITH ACCESSORIES**

Horizontal UV Transparent system, with Platinum electrodes.

MAJOR UNIT: Gel tray size either of 20\*20 cm or 25\*15 cm. Sample size or sample throw put 24 to 96 (To be mentioned)

SUB UNIT 1: Gel tray size 10\*7 cm. Sample size or sample throw put 8 to 30 (To be mentioned)

SUB UNIT 2 Gel tray size 15\*15 or 15\*13 cm.

Mention the Tank and gel size dimensions, Free Scoops and other accessories such as combs, their sizes and Sample size or sample throughput in each case.

#### **ACCESSORIES**

ELECTROPHORESIS POWER UNIT: Output DC voltage 10-300V variable. Output current 4 to 400 mA variable. Input voltage 230V, 50 HzA. Output 4 parallel output, 4 millimeter. Display digital. Power 75 W. Dimensions and weight to be mentioned.

Additional Combs: rates and specification of additional combs to be provided

Gel loading micro-pipettes (Individual rates to be mentioned). 0.5-10  $\mu$ l (2 numbers). 2-20  $\mu$ l, 20-200 $\mu$ l, 100-1,000  $\mu$ l, multichannel (0.5-10  $\mu$ l).

Individual rates for different items may be mentioned however Consolidated rate will be considered.

#### 4. SPECIFICATION FOR DILUTOR

Dilutor <b>Volume Range</b>	1.0 $\mu$ L–25 mL 1 $\mu$ L–10 mL from the probe (transfer tubing up to 10 mL) Up to 25 mL from the reservoir in one stroke; up to 99 mL from the reservoir in several strokes
<b>Liquid Contact Materials</b>	FEP, PTFE, PEEK, Ekonol, glass, and ceramics
<b>Maximum Dilution Ratio</b>	1:10 for any given dilution (to stay within the RSD range);
<b>Maximum Pressure</b>	0.8 MPA (8 bar, 100 psi) for 0.1- to 10-mL syringes 0.3 MPa (3 bar, 40 psi) for 25-mL syringe
<b>Power Requirements</b>	Frequency: 50–60 Hz Voltage: 220–240V;

<b>Syringe Capacity</b>	5, 10, or 25 mL
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#### **Warranty & Service conditions**

- One year warranty from date of installation
- Extendable upto 3 years
- Service should be provided within 15 days

#### **Other conditions**

The instrument should have been supplied to minimum ten Indian Institute/ Universities. The addresses & phone numbers of these institute should be provided.

#### 5. SPECIFICATION FOR FLAME PHOTOMETER

1. Range : 0 to 199.9ppm
2. Limit of detection : Na 0.2 ppm  
K 0.2 ppm  
Ca 15 ppm
3. Reproducibility : <1% coefficient of variation for 20 consecutive Samples using 10ppm Na set to read 50
4. Linearity : < 2% error when 3ppm Na/K is set to read 100
5. Stability : < 2% drift over 5 min when continuously Aspirating 10ppm samples set to 50
6. Specificity : Interference from Na/K equal in Concentration to test element will be <0.5%
7. Electrical : Electrically compatible with standard Indian conditions
8. Fuel : LPG
9. Size : To be mentioned
10. Weight : To be mentioned

Output through Computer program

**Warranty & Service Conditions: Minimum One year Warranty & Service should be provided with 15 days**

**Other Conditions: The instrument should have been supplied to minimum ten Indian Institute/Universities.**

**The addresses & Phone No. of the users Instt./Univ. should be provided.**

**6. SPECIFICATIONS OF GENERATOR**

DIESEL operated **40 KVA Generator**

Mounted on Trolley

One change over switch of 100 ampere is to be supplied with genset

With Standard accessories and Canopy

**7. SAMPLE DIGESTION SYSTEM**

- a. Sample digestion system is required for microwave assisted digestion of plant samples in a safe manner. The digestion system should include two magnetrons, more than 1000W unpulsed microwave power, sophisticated sensors for reaction control, cooling system, stored library of tested methods, magnetic stirrer. The system should have high performance digestion rotors.
- b. The digestion system should also have applications of microwave assisted extraction and direct evaporation of acids and concentration of aqueous sample solutions

**8. MODULATED FLUOROMETER WITH ACCESSORIES**

- i. Field portable, battery operated modulated fluorometer for the measurement of most of the commonly cited fluorescence parameters including dark adapted parameters, light adapted parameters and quenching coefficients.
- ii. The system should include dark adaptation clips, leaf clip with PAR and temperature sensor, batteries with charger, interface cable, software for data processing, inbuilt far red light source for excitation of photosystem I,
- iii. Warranty, installation and demonstration.
- iv. AMC charges after the expiry of warranty period (optional)

**9. SPECIFICATION FOR DOUBLE DISTILLATION PLANT**

- Borosilicate boiler
- Borosilicate condenser
- Quartz Heater
- Horizontal/Vertical Type
- Water softner
- Distillate Water out put (2.5-3 L/h)
- Electrical running on 230-250 V single phase quartz heater
- Cooling water consumption about 100 L/hr
- Pyrogen free output distillate
- pH 6.9-7.0 output distillate
- Conductivity <=1 micro mhos
- Organic matter – nil
- Total solid –nil
- Powder coated stand and or enclosed in a box
- Power auto cut facility

**10. ANALOG TYPE TENSILE STRENGTH TESTER**

**Analog Type Tensile Strength Tester is not required at present, therefore the tender for this need not be submitted.**

## 11. SPECIFICATION FOR GUELPH PERMEAMETER

GUELPH PERMEATER KIT should contain the following components:

Soil Auger,

filling bottle,

dual reservoirs,

hand vacuum pump,

standard size stand.

Weight around 20 kg

Operating Range  $10^{-2}$  cm/s to  $10^{-6}$  cm/s.

Operating Depth 6"-15" (15-38 cm) (standard) or 6"-20" (15-610cm) (extended)

Volume.0.9 gal (3.5 liter)

Water container 2.9 gal (11 liter)

Standard carrying case for all the above components.

## 12. SPECIFICATIONS FOR AUTOCLAVE

- Chamber volume: 80 L
- Vertical loading with service basket.
  
- Digital PID microprocessor controller precisely control set temperature within  $\pm 0.5^{\circ}\text{C}$  and sterilization time in min:sec.
  
- Dual LED displays present temperature and set temperature or remaining time simultaneously.
  
- Stainless steel 304 (AISI304) interior, lid and top to protect from corrosion by water and steam.
  
- Incoloy heating element provides long life, resistant to corrosion and high temperature in repeated use.
  
- Triple safety feature for over temperature and over pressure.
  
- Pressure up to  $1.2\text{kg-f/cm}^2$
  
- Temperature range up to  $123^{\circ}\text{C}$
  
- Digital PID control with pt-100  $\Omega$  sensor.
  
- Fully automated sterilization cycle.
  
- Triple safety feature.

**13. Specification for Laser Leveler**

1. Range upto 3000ft. Diameter
  2. Accuracy upto 1/8"
  3. Power 12 Volts Trailer Galway operations
  4. Dual Slope Transmitter
  5. Bucket Scraper for 75 H.P. Tractor 96" (8 feet) or Bucket Scraper for small Tractor 50 H.P 82" (6 feet 8")
- (Rates for Bucket may included in separate for both Tractor)**
6. Automatic / manual control Unit

**14. Specification for IRGA (INFRARED GAS ANALYZER OR PORTABLE PHOTOSYNTHESIS SYSTEM)**

1. Two dual CO<sub>2</sub> and H<sub>2</sub>O analyzers in the sensor head (total 4 analyzers) in the sensor head for quick response
  - (a) Processor speed: 400 MHz (very fast response processor)
  - (b) Remote control through internet
  - (c) Flash card of 1 GB
  - (d) Training DVD to be supplied with the system
2. CO<sub>2</sub> analyzer (0-3000 umol/mol, with umol/mol sensitivity at 350 umol/mol. H<sub>2</sub>O analyzer 0-75 m mol/mol, with 1m mol/ mol accuracy.
3. Band width 10 HZ Automatic temperature control through software  $\pm 6$  °C from ambient standard leaf chamber: 6 cm<sup>2</sup> with PAR Sensor (internal).
4. External PAR sensor for ambient PAR conditions
5. CO<sub>2</sub> injector system having CO<sub>2</sub> source assembly, CO<sub>2</sub> controller, CO<sub>2</sub> cylinders 12 gm-100 numbers. Cylinder should be supplied with the system.

Four rechargeable batteries with charger, RS232 cable for DTE & DCE devices CD with software, spare parts (leaf temperature thermocouple, field stands with extension bags carrying case, manual, etc.

Eight Spare channels for connecting external sensors  
Accessories compatible to the instrument: (Optional)

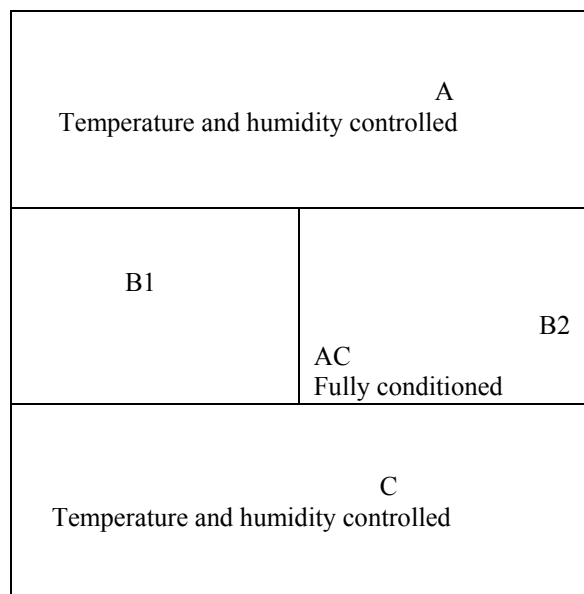
6. Red and blue red light source- Red Led 665 nm  
Blue Red 470 nm  
Intensity of red and blue light can be varied according to requirement
7. System console with 128 MB ram MEMORY FOR DATA PROCESSING  
Display of different – parameters having LCD graphic display  
Flash Memory 64 MB or more for data storage, additional data storage on flash card IGB Flash Card supplied with system  
Power requirement about – 10 to 15 VCD. Four Batteries to be supplied with the system
8. 6400-09 soil CO<sub>2</sub> flux chamber with soil probe thermocouple & soil collers with gaskets and miscellaneous spare parts
9. 9964-150 CO<sub>2</sub> and chemical kit -2 No.  
Accessories and needle chamber and additional

**Required to be supplied: ISO Certificate of the manufacturer, List of spares and bibliography of published papers with quotations, List of users in India and Brochure with the quotation.**

### 15. Specification for Repair of Glass House

SL. NO.	PRODUCT TECHNICAL DETAILS	UNITS
1.	<p><b>Air Conditioner (Window type)</b> Air conditioner unit each of 1.5 ton, Bio-safety grade with voltage stabilizer, which should maintain minimum <math>25^{\circ}\text{C} \pm 3^{\circ}\text{C}</math> during summer.</p>	04 Nos.
2.	<p><b>Biotech Heat Convector Gerat (Oil Filled type)</b> Electric heat convector gerat system <b>10 KW</b>. It should contains Thermal Cutoff safety device and Tip-Over Safety Switch compact and portable and noise free operation, adjustable temperature control voltage (volts) 230 and Complete uniform heat circulation system. Special heat convector gerat system</p>	05 Nos.
3.	<p><b><u>Minor Pane Microprocessor Control Panel:</u></b> <b>Microprocessor Photosynthesis Monitor Panel, which includes Light, Temperature &amp; Humidity Control System.</b> (Digital Temperature and humidity controller with sensor for operating cooling and humidification system, light controller photoperiodic separate for each chamber. All electric fitting are ISI marked. User Programmable time proportional controller.)</p> <p><b>a) Technical features of Photoperiodic Timer for Light</b> - Cycle: 24 hrs minimum ON/OFF period 30 minutes. - Accuracy: <math>\pm 10</math> sec/day - Input: 200-240 VAC, phase – single. - Ambient: <math>5^{\circ}\text{C}</math> to <math>45^{\circ}\text{C}</math>, RH up to 85% normally</p> <p><b>b) Technical features of Temperature Control System</b> -Temp. Range: 0.1 to <math>59.9^{\circ}\text{C}</math>. -Accuracy: <math>\pm 1^{\circ}\text{C}</math>. -Hysteresis: <math>0.4^{\circ}\text{C}</math> with sensor probe Pt-100 Sensor cord 5 meters. -Input: 200-240VAC (110 VAC available on demand), phase-single. -Ambient: <math>5^{\circ}\text{C}</math> to <math>45^{\circ}\text{C}</math>, RH up to 85% normally.</p> <p><b>c) Relative Humidity Control System:</b> It maintains RH in the range of <math>\pm 4\%</math>. - Range: 30% to 90%. - Real RH: <math>\pm 2\%</math>. <math>\pm 1</math> digit (at 45%). - Input: 220VAC (110VAC available on demand), phase- single. -Ambient: <math>5^{\circ}</math> to <math>45^{\circ}\text{C}</math>, RH up to 95%.</p>	1 Nos.
4.	<p><b><u>Minor Pane Microprocessor Control Panel:</u></b> <b>Microprocessor which includes Temperature &amp; Humidity Control System.</b> (Digital Temperature and humidity controller with sensor for operating cooling and humidification system, for each chamber. All electric fitting are ISI marked. User Programmable time proportional controller.)</p> <p><b>a) Technical features of Temperature Control System</b> -Temp. Range: 0.1 to <math>59.9^{\circ}\text{C}</math>. -Accuracy: <math>\pm 1^{\circ}\text{C}</math>. -Hysteresis: <math>0.4^{\circ}\text{C}</math> with sensor probe Pt-100 Sensor cord 5 meters. -Input: 200-240VAC (110 VAC available on demand), phase-single. -Ambient: <math>5^{\circ}\text{C}</math> to <math>45^{\circ}\text{C}</math>, RH up to 85% normally.</p> <p><b>b) Relative Humidity Control System:</b> It maintains RH in the range of <math>\pm 4\%</math>. - Range: 30% to 90%. - Real RH: <math>\pm 2\%</math>. <math>\pm 1</math> digit (at 45%).</p>	2 Nos

	- Input: 220VAC (110VAC available on demand), phase- single. -Ambient: 5° to 45°C, RH up to 95%	
5.	<b>Humidifier</b>  <b>Specifications: Executive:</b> It should produce vapor simulating natural humidity and should make atmosphere clear and comfortable to plant growth and development.  Specifications: Produces simulated Natural Humidity. Special feature: Technical: 2KW low-density polymer thermal isolation reduces energy losses during OFF Period to minimum. Input: 220VAC.	04 Nos.
6.	<b>A) PAR Photosynthesis Lamps,</b> Photo synthetically Active Radiation Photosynthesis Lamps with the emphasis on the blue and red ends of the spectrum, PAR fluorescent lamps are perfectly matched to the spectra essential to photosynthesis in plants.  Photo synthetically Active Radiation Lamp with <b>Photo simulators</b> , (PACRa™) to provide the optimum growth light required by the plants in the glass house. Each T-5 Type lamp of: 40W Size: 4' wide (Principally looking wise it seems like a fluorescent tube light). <b>B) Electronic gear system to operate PAR tube lamp</b>	14 Nos.
7.	<b>Cooling system of hardening chambers:-</b> should consist of 150 mm thick cellulose celdex cooling pad (Imported) complete with GI frame PVC tank 500 lt. ISI marked monoblock pump ISI mark and heavy-duty exhaust fan single-phase with louvers ISI mark.	2
8.	<b>Electrical fitting:</b> All wires should be of 6mm copper and desired load (Make-Kalinga/Plaza) and switches imported make, extra switches also provided as standby. Each feature has own electric line with MCB and will be underground in PVC pipe complete set with A grade work.	1 Complete Job
9.	<b>Dismantling and Flooring:</b> area 155m <sup>2</sup> good quality flooring with slight slope for easy drain out of water	1 Complete Job



map

Glass house

Cooling pad

AC

Cooling pad

## **16. SPECIFICATIONS FOR WET SIEVING APPARATUS**

Wet sieving apparatus includes a shaking machine for wet sieving method, suitable for 8 sieves, including adaptor 100-240 Vac. Stainless steel can for wet sieving method having dimension of Ø 64x45 mm. Sieve can for wet sieving method. Dimensions: Ø 39x39 mm, sieve opening 2, 1, .5, 0.250, 0.125, 0.063, 0.053 & 0.045 mm, sieve surface 10.2 cm<sup>2</sup>.

## **17. SPECIFICATIONS FOR SEDIMENT SAMPLING EQUIPMENT**

1. Multi sampler, rod operated, transparent, acrylic, dia 50 mm, length 1m, contents 1.14 litre, bay. (incl. 1 sharp cutting head and one cutting head with ball valve seating and ball)
2. Sampling tube for multisampler acrylic, dia 50x5 mm, length 1m, contents 1.14 litre.
3. Double action piston, NBR Rubber, with rod connector, for sample tube multisampler internal dia 39-41 mm.
4. Cap, polyethylene, for inside 40 mm, set of 20 pcs.
5. Stainless steel ball, dia 25 mm.
6. Ropes (2) stress proof, with noose, length 5m, polyester, covering, strong stretch proof, core material for accurate operation of pistons in core samplers. Complete with one carabine hook.
7. Handle, normal, 60 cm, with all synthetic, detachable grip (incl. coupling sleeve), bay.
8. Extension rod, 100 cm, (incl. Coupling sleeve) bay.
9. Coupling sleeve.
10. Carrying bag for field equipment, with two shoulder staraps (backpack model), (inside) dia 17x50 cm.

## **18. SPECIFICATIONS OF SPECIFIC ION METER WITH ELECTRODES**

S. No.	Parameter	Detailed information
1.	Meter type	Dual channel portable/bench top type with stand
2.	Electrode type preference	Separate/integrated
3.	Electrode construction	Solid state combination for fluoride and plastic membrane combination for nitrate
4.	Electrode connector	BNC
5.	Range	pH -2.00 to 20.00 mV -2000 to 2000 ion 0.0001 to 19,999 ISE Temperature -5.0 to 105.0°C
6.	Resolution	pH 0.1/0.01 mV 0.1 ion 0.1/0.01/ ISE Temperature 0.1 °C
7.	Accuracy	pH ±0.002 mV ±0.1 mV ro 0.05% whichever is greater concentration ±0.17 mV ro 0.05% whichever is greater Temperature ±0.1°C
8.	Calibration	pH 5 points

	mV	5 points
	ion	5 points
9.	Buffer recognition	US/NIST, DIN, and custom buffer sets
10.	Temperature compensation	Automatic
11.	Display	Back lit LCD with dual parameter display
12.	Computer connectivity	USB/ RS-232
13.	Logging memory	500-1000 data points with date and time
14.	Power	220-240 V AC /battery option
15.	Battery life	200 hours
16.	Operating temperature	5 to 45°C
17.	Additional items & features	Temperature and pH electrodes, Calibration and storage solutions Good lab practice (GLP) features, electrode verification, stability and averaging functionality in software, automatic blank correction for ISE measurements, dustproof and splashproof electrodes

## **19. SPECIFICATION FOR PRESSURE PLATE APPARATUS**

(i) Low-Pressure Chamber for the pressure range 0 to 1 bar (0 to 100 kPa) including all safety features and ceramic plates for the pressure range 0 to 100 kPa.

(ii) High-Pressure Chamber for the pressure range 0 to 15 bar (0 to 1500 kPa) including all safety features and ceramic plates for the pressure range 0 to 1500 kPa.

(iii) Air compressor

## **20. SPECIFICATION FOR PRESSURE CHAMBER**

Pressure chamber or plant status console for measuring the plant water status of leaves and twigs. The system with air supply must include the following

1. Pressure Vessel 7" (18 cm) high
2. Specimen holder
3. Pressure unit 0 to 40 bar range
4. 32" (81 cm) legs (set of 4)

Specimen holder – should be general purpose specimen holder which can be equipped to accept round petioles from 1/32" diameter to 1/2" diameter and short petioles 3/8" long. It can also be used with blade-type leaves upto 1/2" wide and on mid vein of larger leaves. Comes with 1/16" I.D., 1/8" I.D., 3/6" ID, 1/4" I.D. and blank sealing sleeves and support washers with 1/4" diameter hole and 9/64" diameter hole

High pressure bottle filling system and compressed gas cylinder-25 cubic ft capacity nitrogen supply tank; 1 unit additional source tank regulator and three way pressure control valve.

Sealing Sleeve - 1/2" OD with 1/16" hole  
1/2" OD with 1/8" hole and 1/2" OD with 1/4" hole

Sealing Grommet- 1/2" hole and 1/8" hole

Support Washer- 1/4" hole, 1/8" hole and 3/16" hole

Items for routine measurement need be included.

## **21. SPECIFICATION OF CHLORIDE METER**

Range 10 to 350 me Cl per litre; Reproducibility  $\pm 2$ me/l

Test time 30 sec for 100 me/l per sample

With Chloride electrode and other required accessories

