

बीरबल साहनी पुरावनस्पतिविज्ञान संस्थान, लखनऊ  
BIRBAL SAHNI INSTITUTE OF PALAEOBOTANY, LUCKNOW

टेलीग्राम पेलियोबॉटनी

53, विश्व विद्यालय मार्ग

दूरभाष 2740008, 2740011

लखनऊ - 226007

फैक्स ९१-91-522-2740485, 2740098

बी सा पु सं /III/भंडार एवं क्रय/ C-648

Date: 29.07.2014

Convener, Website Committee  
BSIP, Lucknow

**Millipore Water Purification System ( Milli Q Integral 3 Purification System)  
( Specification attached)**

*Attach Authorization or ISO Certificate alongwith quote separately for each item.*

**Subject:** -----

Dear Sirs,

This Institute intend to purchase item mentioned above. Sealed quotations are invited so as to reach this office on or before 5:00 P.M. on 11.08.2014 duly superscribed by "Millipore Water Purification System" due to open in presence of vendors at a later date to be notified.

While submitting quotation please note that:

1. The material may either of indigenous manufacturer or of foreign make, available from ready stock. Any offer to supply on forward Delivery Basis under suppliers own quota license will also be considered.
2. The price quoted should be F.O.R. Destination.
3. Your rates should include packing, insurance and forwarding charges.
4. The rates of Sales Tax should be clearly indicated wherever chargeable. The tendered should also indicate Central/Sales Tax Registration Number and date in this quotation.
5. Specific mention should be made whether the offer is for supplies available ex-stock. In case the officer is on Forward Delivery basis, firm delivery period must be indicated.
6. The cover should be sealed and superscribed "Quotation for "Millipore Water Purification System" must be written on envelope. The quotations not complying the procedure will be rejected.
7. Payments will be made by crossed cheque on The Indian Overseas Bank, Lucknow only after receipt and acceptance of supply and installation/ if required satisfactory.
8. The acceptance of the quotation will rest with the Director who does not bind himself to accept the lowest quotation and reserves the right to himself to reject or partially accept any or all the quotation received without assigning any reasons.
9. The quotations are liable to be cancelled if any of the above mentioned conditions are not complied with.

Yours faithfully,



(Swapna Mazumdar)

Section Officer

Store & Purchase Section

## **TECHNICAL SPECIFICATIONS FOR WATER PURIFICATION SYSTEM**

Single Integrated System should be capable of producing type II (10-15 Megaohm resistivity ) and type I (18.2 MΩ resistivity) directly from tap water. The feed water acceptance should be upto 2000 μS conductivity, Fouling Index (SDI) < 20, Total Chlorine < 3 ppm.

To guarantee compliance with minimum laboratory safety requirements, and to ensure that the water purification system meets internationally-recognized safety norms, the water purification system shall be listed with Underwriters Laboratories (both UL and ULC), and will carry the CE mark, indicating compliance with EC Directives.

|                  |   |
|------------------|---|
| <b>STAGE 1</b>   | * 2 Stage pretreatment system   |
| <b>PREFILTER</b> | * 5 micron and 1 micron wrapped type depth filter   |
|                  | * Less than 50 Db noise levels  |
|                  | * Automatic low/high pressure cut off   |
|                  | * DC pump with 0-2 pressure at 120L /hr   |
|                  | * Inlet screen filter to DC pump  |
|                  | * Optional: 0.5 or 1 μ pleated filter with high particulate retention capacity and Activated carbon   |
| <b>STAGE 2</b>   | * Inbuilt Pretreatment should contain anti scaling compound, activated carbon and 0.5 μ filter.   |
|                  | * Pump with unique temperature feed back mechanism  |
|                  | * High flux Thin film composite polyamide RO membrane with 94- 99% ionic rejection with conductivity measurements before and after the membrane to ensure the performance of RO.                                  |
|                  | * Recirculation loop with capillary tube and diaphragm valve.   |
|                  | * Mixed bed ion exchange resin filled electro deionization module with auto regeneration by a weak electric current, eliminating the need for chemical regeneration or replacement of DI resin cartridges.        |
|                  | * EDI (ElectroDeionisation) module should not require additional softening pre-treatment.   |
|                  | * Carbon beads at cathode of the EDI module to prevent scaling of the module on a long run.   |
|                  | * Reverse osmosis Permeate divert valve which will divert low quality water to the drain automatically.   |
|                  | * Coaxial resistivity cell with a flow through design and a cell constant of $0.01\text{cm}^{-1}$ and should display both compensated and non-compensated temperature accurate within $\pm 0.1^{\circ}\text{C}$ . |
|                  | * UV lamp 254 nm to remove germicidal effect before entering the tank   |
|                  | * The system should have optional facility to deliver Type II Water flow rate @ 2l/min using Volumetric dispensing arm with 0.22 micron filter which can be put at 3 m distance long.                             |
| <b>STAGE 3</b>   | A blow molded, cylindrical PE reservoir with a conical bottom and opaque walls with a 30 liter capacity   |
| <b>RESORVIOR</b> | The tank should fill from the bottom  |
|                  | Should possess a tank vent filter made of soda lime, activated carbon and 0.22 micron hydrophobic membrane to trap contaminants present in atmospheric air.   |
| <b>STAGE 4</b>   | * Low pressure mercury vapor lamp made of ultrapure quartz with dual wavelength ( 185 and 254nm ).The lamp should possess an electro polished 316L ss housing   |
|                  | * Application Specific cartridges to remove ionic and organic contaminants to trace levels  |
|                  | * Built in TOC monitor with a 0.5mL Quartz cell and UV lamp which accurately measures TOC online from 1-999ppb .  |
|                  | * Water production unit that can be placed either on the bench , under the bench or on the wall   |
|                  | * Point of delivery unit with the polishing filters at the point of use with an Option of connecting 3 units with the main water producing unit   |



|                             |  |
|-----------------------------|--|
| <b>STAGE 5</b>              | <p>*Stand alone point of delivery unit with</p> <p>1. Adjustable height and rotating arm [360°] - adjustable to any glass ware.</p> <p>2.Multi colour monitor displaying : resistivity,TOC,level of water in reservoir,volume dispensed and other alarms, printing to be directly accessible from the point of delivery unit</p> |
| Dispensing unit             | <p>* <b>Final Filters Options :</b> a) Pharmaceutical grade , final filter with 0.22µ membrane filter in stack disc configuration.</p>   |
|                             | b) Disposable UF cartridge at the collection end with LRV is between 5 and 7 over challenge range of 220 and 22000 Eu / mL .   |
|                             | c) C18 filled pak for trace organic applications.  |
|                             | d) Activated carbon pak for Volatile organic free water applications.  |
| Electronic data acquisition | System should contain inbuilt Data management system with record keeping capabilities and a powerful search engine to retrieve data on water quality and system performance.   |

#### **Pure (Type II) water:**

Particulates .....< 0.22 µm ( / mL)< 1  
 TOC (ppb) .....< 30  
 Production Flow Rate (L/hr).....3L  
 Bacteria.....< 1 cfu/ml(with remote dispensing arm)  
 Resistivity.....10- 15 MΩ  
 Pyrogens .....< 0.001 EU/ml ( With optional UF cartridge )

#### **UltraPure (Type I) water:**

Ultrapure Water (Type I) Flow Rate (L/min).....0.05 to 2( Programmable flow rate)  
 Ultrapure Water Resistivity (MΩ·cm at 25°C).....18.2  
 Microorganisms (cfu/mL).....< 1  
 Particulates < 0.22 µm ( / mL).....< 1  
 Pyrogen Levels (EU/mL) .....<0.001  
 RNase Level (ng/mL) .....< 0.01  
 DNase Level (pg/µL) .....< 4  
 TOC (ppb) .....< 5

#### **Additional requirements**

1. *To avoid maintenance errors and to improve traceability, the internal primary consumable water purification cartridges will have a built-in RFID tag*
2. *To prevent deterioration of water quality during periods of non-use, the ultrapure water system will be able to recirculate water to maintain high water quality.*
3. *The water system will incorporate a built-in Quick Reference Guide for immediate understanding of the main operations.*