



**INDIAN INSTITUTE OF TECHNOLOGY BOMBAY
MATERIALS MANAGEMENT DIVISION
Powai, Mumbai - 400076**

Rfx - 6100000460

Technical Specifications

Single Integrated System for Pure & Ultrapure Water Purification

Single Integrated System should be capable of producing Pure water with flow rate not less than 16 lit/hr. and type I (18.2 megaohm resistivity) with pretreatment cartridge, Reverse Osmosis, Dual Wave length UV lamp, Mixed bed ion exchange resin, inbuilt TOC and Final optional membrane.

Feed Water Acceptance	
Conductivity	< 2000 μ S/cm
Fouling Index (SDI)	< 12
Total Chlorine	< 3 ppm
TOC	< 2000 ppb
Pure Water Quality	
Product Water delivery	16 Lit/hr
Ionic Rejection	90-99%
Organic rejection	>95%
Bacteria:	>99%
Particulate	>99%
Type I Water Quality	
Ultra-Pure Water flow rate	0.05 to 2 L/min (Programmable flow rate)
Ultra-Pure Water delivery	18.2 M Ω ·cm at 25°C
TOC	< 5ppb
Pyrogens	< 0.001 EU/ml (pyrogen-free)
RNases	< 0.01 ng/ml (RNase-free)
DNases	< 4 pg/ μ l (DNase-free)
Type III & I System requirement	
Pre Filter	<ol style="list-style-type: none">1) Single Compact pretreatment unit containing 5 & 1 Micron depth filter with low voltage & Pump with noise levels of less than 50 decibels .This should have the facility to mount on the table or wall .2) System can handle feed water with TDS as high as 5000 ppm & SDI upto 50. Vendor must provide catalogue for this Pre filtration unit

Pretreatment Cartridge	<p>Three in One Pre-treatment Cartridge with</p> <ol style="list-style-type: none"> 1) anti-scaling compound to control the hardness of water 2) 0.5 Micron Depth filter to control the particulate load 3) Activated Carbon Beads to control chlorine of feed water. 4) Above cartridge should come with RFID tag for traceability.
RO Membrane	<ol style="list-style-type: none"> 1) The system with have a high Flux thin RO Membrane with min. 200 daltons cutoff & water quality monitoring after every purification stage to monitor the process of RO rejection in percentage % (Conductivity before & after RO) 2) System should have with temperature feed back mechanism to get a constant flow rate of RO irrespective of feed water temperature 3) System equipped with high waste recovery loop to reduce the water wastage to the drain . 4) Reverse osmosis Permeate divert valve (Three Way Solenoid Valve) which will divert low quality water to the drain automatically. 5) System must have Conductivity Cell before and after RO membrane for understanding rejection ratio.
RESERVIOR	Storage tank with 100 Lit. Capacity 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
Polishing Cartridge	* Application Specific cartridges to remove ionic and organic contaminants to trace levels. Polishing Cartridge must come with RFID tag for traceability.
<i>Application-specific water qualities through customized final polishers</i>	
O.22 Mircon Filter	0.22 µm membrane filter for particulate-free and bacteria-free water at the point of dispense for HPLC Application
TOC	System should have capability to dispaly TOC with range from 1-999 ppb.
RFID Technology	To avoid maintenance errors, such as connecting the wrong consumable or an exhausted consumable , these consumables will be labeled with RFID tag carrying critical information such as supplier name, consumable name, catalogue n°, lot n°. Upon installation on the system, the essential information loaded in the tag will be transferred to and registered in the systems memory. The system will also write into the tag information on the consumable usage during its life time
System Display Alarm & Indication Parameters	<ol style="list-style-type: none"> 1) In built in large display to ensure the system parameters are displayed all the times such as Feed Conductivity , Permeate conductivity ,Pure Water Conductivity , RO rejection in % , tanks level , Type I Conductivity , TOC, temperature both compensated & non compensated value & Consumables status 2) Auto diagnostic facility with No Error and Alarm Code and real time clock to log reports with date and time to ensure complete traceability. 3) Automatic Cleaning, Rising, and Flush mode.
Dispensing Arm	System must have flexible ARM attached to system to adjust the height of every flask available in lab for flexibility of usage and user.

Reference Guide	A built –in Quick Reference Guide for immediate understanding of the main system
Vendor Technical Capability	<p>To Validate the Technical Specification Vendor must provide catalogue mentioning flow Schematic as per below details</p> <ol style="list-style-type: none"> 1) Inlet Solenoid Valve 2) Pre treatPack (0.5 Micron Filter + Activated Carbon + anti-scaling compound 3) Booster Pump 4) Feed Conductivity Cell (Before RO) 5) RO Module 6) RO Reject recovery Loop 7) RO Conductivity Cell (After RO) 8) 3- way solenoid Valve (To ensure the good water Quality) 9) Storage tank 10) Recirculation Pump 11) UV Lamp (To reduce the TOC 12) 3 -Way solenoid Valve (To indicate the TOC) 13) Conductivity Cell for Measure Ultra pure TOC 14) Polishing Cartridge 15) Conductivity cell to monitor final Ultra Pure water 16) Ultra Pure Water dispenser
Warranty and AMC	Vendor must provide Warranty for 2 Years and AMC for 3 years after Extended Warranty Period
After Sales Service	Vendor must give in writing for 7 years service back up after date of installation.

TECHNICAL SPECIFICATIONS :

Ultra pure water system specifications:
The system is to generate Ultra pure water for analytical laboratory techniques directly from drinking/ Tap water. The Pre filtration unit with 1 um depth filter should be provided. System must capable enough to tackle feed water specification as Conductivity < 2000 μ S/cm, TOC < 2000 ppb, Chlorine < 3 ppm, Hardness < 300 ppm
1. The system should guarantee the water purity of 18.2 M Ohm-cm.
2. There should be an advance warning of cartridge change.
3. The system should be able to remove all ionic and organic contents to trace levels in the feed water
4. The system should be capable of Wall-mountable and completely assembled for easy installation
5. The intermediate water quality should be delivered for regular lab work. Since requirement is very low, generation flow should not be more than 3 ltr/hr.
6. The storage tank should be of very low size and not be more than 8 ltr to avoid storing of water.
7. System should incorporate graphic colour display and real-time monitoring of water purity. System must be provided with UV Lamp.
8. The system should be compatible to work with power supply of 240 V AC and 50 Hz.
9. The cartridge should be all in one pack only with RO pre-treatment and Ion Exchange resins. Multiple cartridges should be avoided so that a single pack can be replace easily.
10. A 0.22 μ m screen Filter setup at the outlet of water purification unit to avoid particulate matter and to ensure safe bacteria level.
11. Operation and maintenance manual to be provided along with the instrument.
12. System must have recirculation facility to keep water quality always in good quality when system is not in use.
13. Vendor must provide catalogue and flow diagram with above details. The flow diagram must match with vendor's global/local website.

Type I Water Specifications :-

Conductivity : 0.054 μ S/cm @ 25 degree C

Resistivity : 18.2 M Ω .cm @ 25 degree C

TOC : 10 ppb

Bacteria : <0.1 cfu/ml

14. Vendor must provide after sales service for minimum of 7 years after installation of system.

15. Vendor must provide warranty for 2 years and 3 year AMC after warranty period.