Technical Specifications/Requirements for Ultrapure Water Purification System

Water purification system:

- Capable of producing 10-15 Mega ohm resistivity with pretreatment cartridge
- Reverse Osmosis
- Electro Deionization with feed water acceptance of up to 2000 micro Siemens conductivity
- Fouling Index (SDI) < 12
- Total chlorine up to 3 ppm
- Multistage system
- Should have two stage pretreatment system
- Pre-filter should be 5 micron and 1 micron wrapped type depth filter
- Should comprise of at least one pressure gauge & pre-filtration unit should take TDS up to 5000 & SDI (Silt Density Index) up to 50
- Should have less than 50 Db noise levels
- Should have automatic low/high pressure cut off
- Should have DC pump with built in sensor & VFD , 0-2 pressure at 120L/hr
- Should have Inlet screen filter to DC pump
- Optional filters : Pre-filtration unit should have an option to use Cellulose carbon cartridge 10 inch Code X Cartridge to remove highly particulate loaded tap water due to seasonal change.
- Pretreatment cartridge with anti-scaling compound, 0.5 micron filter and activated carbon.
- Should contain Radio Frequency Identification tag for easy tracebility & to have water consumption data for one year from the date of cartridge installation.
- Pump with unique temperature feedback mechanism
- Should have high flux thin film composite polyamide RO membrane with 94-99% rejection
- Should have recovery loop with capillary tube and diaphragm valve
- Conductivity cells before and after RO should provide the efficiency of the membrane in rejecting the contaminants as well as the permeate water quality.
- Should have electro deionization module with auto regeneration by a weak electric current, eliminating the need for chemical regeneration or replacement of DI resin cartridges.
- EDI (Electro DeIonisation) module that should not require softening pre-treatment.
- Carbon beads at cathode of the Electro DeIonisation module to prevent scaling of the module
- Permeate divert valve which will divert low quality water to the drain.
- Coaxial resistivity cell with a flow through design and a cell constant of $0.01cm^{-1}$
- To display both compensated and non-compensated temperature accurate within ±0.1°C.

- RESORVIOR should be Cylindrical 50 LITER PE reservoir
- Sensor rod float switch, programmed to have high and low level cutoff based on water level in the tank.
- Type I water should be produced from two stage mixed bed ion exchange and activated carbon cartridge, and an option for final filter.
- Type II water should pass through feed water specific cartridge for removal of trace contaminants.
- Cartridge must attach to the water system without treaded fittings, screws, clamps, or locking tabs.
- 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.
- Dispensing height should be suitable to any glassware.
- Volumetric dispensing from 0.5 L till 10L.
- Multi-color monitor displaying : resistivity, level of water in reservoir, volume dispensed and other alarms.
- Final Filters Options : a) Pharmaceutical grade , final filter with 0.22micron membrane filter in stack disc configuration Optional filters : b) Optional VOC final filter to remove volatile organic contaminants & LC Pak final filter for HPLC & LCMS applications, c) Optional EDS pak final filter to use for endocrine discreptor application. Type I system should have different final filters for Applications sensitive to bacteria, particulates, pyrogens, nucleases, endocrine disruptors or Volatile Organic Compounds.

Pure (Type II) water:

Resistivity:	>5 (10- 15) Mega Ohms @ 25 deg C
TOC (ppb):	< 30
Flow Rate (L/hr):	3

Ultrapure (Type I) water:

Ultrapure Water (Type 1) Flow Rate (L/min)	>1.5 L/Min (Programmable flow rate)
Ultrapure Water Resistivity (MΩ·cm at 25°C):	18.2
Microorganisms (cfu/mL)	<0.1
Particulates < 0.22 µm (/ mL)	< 1
TOC Level (ppb)	<10 ppb