

Tender Notice

Liver Foundation, West Bengal (LFWB) invites quotations for a few research instruments from the manufacturers or their authorized dealers for the John C Martin Center for Liver Research and Innovation, Kolkata. Bid closing date is within 19th August, 2024 and you are requested to submit quotations at LFWB office at Chatterjee International Centre, 16th Floor, Room no-12, 33A, Jawaharlal Nehru Road, Kolkata-700071.

List of Instruments:

1. Biosafety cabinet
2. CO₂ incubator
3. Cold Centrifuge
4. Ultra freezer (-86^oC)
5. Ultra centrifuge
6. Confocal microscope
7. Autoclave
8. Liquid Nitrogen container (with automatic refilling system)
9. Fragment analyzer for nucleic acid and single cell genomics libraries
10. Ubuntu workstation with monitor, CPU, Keyboard, mouse and accessories
11. Microcentrifuge (cold) 15,000 rpm
12. Specification for Double beam UV- Visible spectrophotometer
13. Plate Centrifuge
14. Millipore Milli Q water system

Reserve the Right to Cancel: The LFWB reserves the right to cancel this tender notice at any time, without assigning any reason whatsoever. In such an event, the LFWB shall not be liable for any cost or expense incurred by the tenderers.

1. Clean room compatible BSC Technical Specifications

1. The Bio-safety cabinets should be 4 feet wide with the front window must be a 10" sash opening and steel with a smart coat interior
2. **7" touch screen graphical user interface displays safety and performance data and maintenance data including the total accumulated operating hours of the unit, the total UV work hours and the UV bulb install date, the filter running time, estimated residual lifetime of the HEPA filter, and the filter install date.**
3. The Bio Safety Cabinet must include DC motors.
4. The motor must automatically adjust the airflow speed without the use of a damper to ensure continuous safe working conditions, even without maintenance adjustments.
5. Cabinet must use a pressure sensor (rather than an anemometer) to detect pressure drop across the supply filter, rather than in just one point across the downflow.
6. Clear visual and audible alarms are emitted from the device if the downflow, inflow, or other parameters like blower failure, Incorrect window position are not at rational settings and the operator is at risk of exposure to biohazardous materials.
7. The front of the cabinet must be angled 10° to help minimize glare.
8. The cabinet noise level must be less than <63 dB(A) for a 4-foot cabinet.
9. Cabinet with lights on and fan at operating speed should consume less than 200 watts or less
10. The cabinet must automatically reduce the fan/blower motor speed to 30% when the front window sash is in the closed position to ensure reduced energy consumption when the cabinet is not in use.
11. **Programmable UV light enables *timed sterilization* to run to be preset before work commences.** UV light must be programmable to allow for specific exposure times from 0 to 24 hours.
12. **The Bio Safety Cabinet should include LED light with a power of >120 fc with Brightness level adjustment**
13. The Cabinet should have provision to fit taps for Vacuum, Water, and Noncombustible gas.
14. The Biosafety Cabinet should be NSF certified with a listing on the NSF website.
15. The Biosafety cabinet should incorporate a HEPA filter of the class H 14 EN 1822 or better and have a minimum efficiency of 99.995% at 0.3 µm particle size.
16. Ventilation System Exhaust and Inflow air volume approx 300-350 CFM
17. The cabinet should be provided with a fixed / adjustable Height Stand, UV Light and one set of detachable arms rests, and one / two electrical outlets.
18. The Drain Pan of the BSC should be made of Stainless Steel. The drain pan should not be painted, or powder coated.
19. Cabinet should be CE, uL certified and declaration of MOC should be provided.
20. Port provision for clean and safe routing for vacuum tubing and cables through the side of the BSC for improved organization and work efficiency.
21. **Cabinet should include Rear cover kits for flat and smooth enabling easy cleaning for clean room suitability.**
22. **Must be supplied with Thimble duct exhaust transition for 4 foot cabinet and PVC ducting**
23. **Supplier or its Principal company should have service center in and around Kolkata**

- 24. Minimum 200 installation in India**
- 25. Suitable Voltage stabilizer need to be provided.**
- 26. Quoted models must have CE certificate.**
- 27. Quoted model must be available in Company website.**

2. CO2 Incubator Specification (For BOQ Bid In GeM)

Specifications for one Chamber-CO₂ Incubator with work chamber

Technical Specifications for Incubator:	
1.	Chamber volume should be at atleast 150 litres
2.	Relative Humidity (rH): $\geq 90\%$ at 37 °C
3.	CO ₂ management
	<ul style="list-style-type: none"> ➤ range: 0-20% or better. ➤ accuracy: $\pm 0.1\%$ or better ➤ Recovery time for 5% CO₂: less than 5 minutes ➤ Tracking alarm: $\pm 1\%$ ➤ Inlet pressure: 12-15 PSI (0.8-1.0 barr) ➤ Gas purity: min. 99.5 or medical quality ➤ CO₂ inlet: 1/8" hose (barbed) ➤ sensor: TC
4.	Temperature
	<ul style="list-style-type: none"> ➤ range: 3 °C above ambient to at least 55 °C or better. ➤ control: $\pm 0.1^\circ\text{C}$ or better. ➤ uniformity: less than $\pm 0.3^\circ\text{C}$. ➤ Tracking alarm: $\pm 1^\circ\text{C}$
5.	Rapid Recovery of all critical parameters as follows:
	<ul style="list-style-type: none"> ➤ Temperature recovery: in < 10 mins ➤ %RH recovery: < 10 min ➤ % CO₂ recovery with TC Sensor: < 6 min
6.	The incubator should have built in automatic decontamination facility without removing sensor, fan or other fittin Gas screen, 3 interior split doors
8.	Inbuilt water pan with drainage valve in front.
9.	Water pan directly heated by chamber's bottom heater.
10.	Guided air circulation passing the chamber air above the surface of water.

12.	Temperature probe and gas sensors should be located inside the chamber to allow precise monitoring of conditions as the cells.
13.	System should have automatic decontamination routine at moist heat of 90 degree celsius
14.	Interior chamber: electro-polished stainless steel
15.	Exterior chamber: powder coated steel with minimum thickness.
16.	Access port: 40-45 mm diameter
17.	<ul style="list-style-type: none"> ➤ Number of perforated shelves: at least 3 ➤ Max. load per shelf / total load at least 10/30 kg ➤ Input voltage 230-240V, 50/60Hz (without transformer)
18	The CO2 Incubator should feature a water level sensor and alarm to alert user when humidification water refill is required.
19	The unit should incorporate touch screen user interface, a bright, and easy to read control module display.
20	System should have Gas screen with 3 interior split doors
21	The unit should have provision to upgrade as a stackable unit (on top of another chamber).
22.	Warranty: 5 years of comprehensive warranty for the whole system.
23	Service center in or around Kolkata.
24.	Should have minimum 200 installation in India.
25	The quoted model must be visible in company website.
26	CE certificate for quoted model is must.

Co2 Gas Cylinder:

1.	High-pressure CO2 gas cylinder of capacity around 23 kg and above
2	<ul style="list-style-type: none"> ➤ Gas purity: min. 99.5 or medical quality

Gas Regulator:

1.	CO2 gas regulator, 2-stage, for gas tank
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Voltage Stabilizer:

1.	Servo 3 KVA voltage stabilizer with high voltage low voltage cut-off circuit with auto reset, delay timer & spike eliminator. Warranty: 2 years
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3. Centrifuge

Features

The versatile centrifuge has a capacity of maximum 4×250 mL (Centrifuge 5804/5804 R) or 4×750 mL (Centrifuge 5810/5810 R) and reaches a maximum of $20913 \times g/14000$ rpm. The versatility is reflected in the available rotor options. You can select between 12 (Centrifuge 5804/5804 R) or 16 (Centrifuge 5810/ 5810 R) different rotors to centrifuge the following tubes for your various applications:

Micro test tubes (0.2 mL to 5.0 mL)

PCR strips

Microtainers

Spin columns

Cryogenic tubes

Conical tubes (15 mL/50 mL)

Bottles (175 mL to 750 mL)

Various tubes (3 mL to 120 mL)

Microplates

PCR plates

Deep well plates (max. height of 29 mm)

Slides (with Combi Slide adapter)

Cell-culture flasks

Handling the centrifuge is facilitated by:

Low access height of 29 cm for loading and unloading the rotors

Automatic rotor detection with rotational speed limit

Automatic rotor imbalance detection

Clear digital display

All centrifuges in these series have 35 program slots for user-defined settings and 10 different acceleration and braking ramps.

Adapter-specific manual radius adjustment guarantees maximum RCF accuracy.

The Centrifuge 5804 R/5810 R has an additional temperature control function for centrifugation between -9°C and 40°C. Use the Fast Temp function to start a temperature control run without samples to adjust the rotor chamber incl. rotor, buckets and adapters quickly to the set temperature. Continuous cooling maintains the temperature after the run has been completed – your samples stay cool.

4. Specification for Ultra freezer -80⁰ C

Vertical Module 400 – 500 Ltrs. Or bigger Size

- Temperature Range: -50 to -86⁰ C
- Power: 230 V / 50 Hz. 5% VAC
- Under voltage & over voltage protection
- Digital display of temperature
- Audio visual alarm for under/over voltage temperature
- CFC free
- Environment scan facility
- Sufficient rack with boxes
- Carboard / Polycarbonate sufficient to fill complete freezer.
- 5-year parts and labor standard warranty

5. Ultra-centrifuge

Technical Specifications:

Max. Speed: **Not less than** 100,000 rpm with a **Non-bolt-down design** greatly simplifies installation and flexibility to relocate within a facility

Max. RCF: **Not less than** 802,000xg (with Fixed Angle Rotor); 488,500xg (Swing out Rotor)

Max. Capacity: 6 x 250 ml

Speed control accuracy: ± 2 rpm (1000 rpm to max speed)

Programmability: Minimum 1,000 programs with step-runs

Run Log Database: Must be Up to 5,120 runs recorded in onboard memory

Data Communication: USB: Host x 1, Device x 1 / LAN x 1

Timer: 1 min to 999 hours 59 min (with 1 min increments) with HOLD function.

Temperature control system: thermoelectric cooling (CFC-free)

Temperature Set Range: +0 to +40 °C

Temperature Accuracy: ± 0.5 °C

Ambient Temperature Range: +10 to +30 °C

Temperature Control System: Solid-state thermoelectric module refrigeration (CFC/HCFC/HFC-free)

Vacuum System: Oil-rotary vacuum pump with moisture removal function and oil diffusion pump; vacuum of 0.13 Pa

Functions: must have function like Automatic RCF; ω 2dt integrator; real time control; controlled user access; rotor life management

Dimensions: width – 780 to 790mm, depth – 680 to 690 mm, height – 870 to 880mm

Low Deck height: 870mm or lower

Weight: Not more than 400 kg.

Power requirement: 208-240 V, $\pm 10\%$ 50/60 Hz, 16/20 A, **Single-phase Plug:** NEMA plug 6-30P and IEC60309 CEE plug

Color touch screen (6.5 inch): **should be easy** selection of run parameter and operation for routine spins, simply enter speed, time and temperature parameters. Dual display of SET and RUN conditions allow verifying performance at a glance.

Run scheduling: Must have option for Schedule a run to reserve the centrifuge, or delay start and stop times, so samples ready when needed

- **Machine should accept existing rotors of other make.**
- **Must have option for Carbon Fiber Rotor.**
- Minimum 60 installations of similar machine in India by supplier required to qualify.

Safety and Standards:

Product Safety: EN 61010-2-020, Electromagnetic Compatibility: EN 61326-1

Warranty:

The Warranty period of machine – 1 year, non-prorated; Drive system – 10 years,

Rotor to be supplied:

1. Fixed Angle-- Titanium rotor with volumes 8 x 12.5ml, Speed not less than 90,000 rpm, RCF: not less than 692,000 x g, K Factor-25.1, Net weight \leq 5 kg. Tube Angel 25°. Supplied with 11.5 ml 50 Numbers ultracrimp tube with plug and cap, rotor Cap and all accessories and tools. **Warranty :7 years**
2. Fixed Angle-- Fatigue resistant non corrosive Carbon Fiber rotor with volumes 24 x 1.5ml, Speed not less than 50,000 rpm, RCF: not less than 280,000 K Factor-33, Net weight \leq 5.3 kg. Tube Angel 45°. Supplied with 1.5 ml PA tube. **15 years.**
3. **Swinging** Bucket rotor with buckets for volume 6 x 13.2ml , RPM: not less than 41000 rpm,RCF: not less than 287500 xg, Weight: 5.6Kg, **Warranty: 5 Years.** Supplied with 50 units 13.2ml PA Thin-Walled Tube

6. Laser scanning Confocal microscope

The equipment should have following specifications:

1. Fully motorized inverted Fluorescence research microscope for BF/Fluorescence imaging.
2. Motorized stage for slides, 35/60mm petri dish as well as multi well plates.
3. Fluorescence module: 12V/100W Halogen/LED light source. LED fluorescence applications include 385nm, 470nm, 555nm and 630nm for DAPI, GFP, Cy3 and Cy5 or similar dyes.
4. High precision Z- Focus drive with step size of 10 nm or better
5. Objectives: Confocal grade objectives:
 - a. 10X/0.4 NA or more
 - b. 20X/0.8
 - c. 40X/0.6 NA
 - d. 60/63X/1.40 oil immersion
6. Band pass fluorescent filters for DAPI, GFP and DsRED or similar dyes.
7. Anti vibration table for the system from the manufacturer will be provided along with the main system.
8. Spectral confocal imaging unit with built-in Confocal detectors.
 - a. Capable of simultaneous detection and separation of minimum three fluorophores with atleast 3 independent confocal detectors.
 - b. Atleast one detector should be high sensitive in nature and should have $QE > 40\%$ across the visible spectrum range from 450nm to 850nm
 - c. Data depth 8-bit and 16-bit available

d. The scanner should have real ROI scan capability with functionality of scanning only the specified region of interest to improve the scanning speed. Maximum scan resolution 6Kx6K or better per channel and should reduce to 16X16 -64x64 pixels.

9. The System Should be able scan for high speed imaging and the scanning speed should reach to atleast 200 fps for high speed imaging.

10. Excitation Laser lines with laser module:

a. The following laser lines 405nm, 488nm, 561nm and 640nm will be offered.

11. Confocal imaging work station and software: Suitable and compatible computer workstation with advanced specifications will be supplied with the instrument. Online UPS for the complete system will be included in the supply. The system should have a dedicated online branded UPS system for the whole system.

12. Warranty 12 months from date of installation.

7. Specifications for Autoclave machine

The following specifications are needed:

External Dimensions of the machine should be within: (LxWxH) (Inch): ≥ 20 by ≥ 32 by 36

Internal Chamber Dimensions should be within (DxH) (Inch): 12 x 20

Total required Volume: 40L to 60L

The machine should provide a temperature Range: 121°C

The machine should provide Max. Pressure: 15psi

The machine should provide Digital controller with full display and provision for data recovery for at least 24 hours.

The machine should provide Dial Type Pressure Gauge

The machine should provide Auto Cut-off Pressure valve

The machine should provide Low water alarm

The machine should provide Voltage meter for monitoring

The machine should provide Auto Pressure release sensor

8. Specifications for liquid N2 container

Features:

- Durable Aluminium Structure: Ensures long-term durability and resistance to corrosion.
- Equipped with Racks and Vial Boxes: Includes racks and PC material vial boxes for organized sample storage.
- Large Capacity, Low Liquid Nitrogen Consumption: Efficient design for cost-effective operation with minimal nitrogen usage.
- Small Space Requirement: Efficient storage of large capacity samples while requiring minimal space.
- CE Certified: Conforms to European safety and quality standards.
- Five Years Vacuum Warranty: Provides assurance of vacuum insulation performance for five years.

Specifications:

1. Racks Included: 6
2. Capacity (including) of 2ml Cryo-Vials: 1050
3. Layers of Racks: 7
4. Capacity of Cryo Box: 25
5. Liquid Capacity: 50 liters
6. Static Evaporation Loss: 0.36 liters/day
7. Static Holding Time: 139 days
8. Diameter of Neck: 125 mm
9. Lockable lid
10. External cryo Level monitoring system
11. CE certified
12. Roller base

9. Specifications of the fragment analyzer - DNA-RNA QC Analyzer

1	<p>Automated Analyzer for quality control (QC) of DNA and RNA samples. The Instrument should be used for analysis of Sample size, Quantity, Molarity and Integrity.</p> <p>Instrument should be used for below QC applications.</p> <p>QC of genomic DNA (gDNA) including DNA Integrity Number</p> <p>QC of cell-free DNA with percent of cf DNA purity</p> <p>NGS library QC</p> <p>Analysis of amplified libraries.</p> <p>PCR and multiplex PCR fragment analysis</p> <p>QC of quantitative PCR products.</p> <p>Quality and quantity of total RNA samples from eukaryote or prokaryote origin</p>
2	QC Analyzer instrument should analyze any sample number from 1 up to 16 samples at constant cost per sample.
3	Instrument should be capable to run following application Kits for detection of (1) DNA (Sensitivity of 5pg/ μ l to 0.1 ng/ μ L), (2) RNA (Sensitivity of 100pg/ μ l -5 ng/ μ L), (3) fragment sizes between 50bp to ~60kb.
4	An automated system from sample/reagent loading, processing to analysis with zero cross contamination.
5	No manual Gel dye mix steps for sample preparation should be required. Instrument should have automated loading and walk away operation.
6	The system must be able to accommodate maximum sample volume of 1-2 μ L of precious sample for all applications including High Sensitivity Analysis.
7	The system should be supported with optimized and validated kit for Genomic DNA and Cell-free DNA.
8	The system should support DIN and RIN algorithm to measure the quality of the DNA and

	RNA.
9	The system must be accommodating tube strips or tube strips format.
10	The instrument software must offer feature for calculating the stability of RNA.
11	System must offer individual tips for sample loading to avoid any contamination issues.
12	The system must not use any fragile capillaries for electrophoresis. Instead, rugged chips /tapes / plates and tubes must be used.
13	The system should have integrated bar code scanner.
14	The system must not depend on use of any external/internal Nitrogen cylinder for running the Instrument.
15	The Kits required for the system must not use any mineral oil for preventing sample evaporation
16	The Instrument must be offered with kits of pack sizes of 100- 150 reactions or less to avoid reagent wastage and kit expiry.

10. Workstation Specification for JCMLRI

Sl. No.	Parameter	Qualifying Minimum Requirements
1	Processor	Intel Xeon W5-2465 3.1 GHz 33.75 MB 16 cores 200W CPU or higher
2	Chipset	Intel® W790 chipset
3	RAM	128GB (4x32GB) DDR5 4800 DIMM ECC REG 1CPU Memory or higher
4	BIOS	BIOS of the Workstation to have tool for Enhanced security features like self-healing, regular checks.
5	Drive Controllers	Onboard 5nos SATA @ 6Gbps (RAID 0,1,5,10)
6	Hard Disk	1 TB PCIe-4x4 2280 M.2 Solid State Drive or higher 4TB 7200RPM SATA 3.5in Enterprise or higher
7	Graphics Card	NVIDIA T400 4 GB 3mDP Graphics or Higher with Adaptor to connect monitor
8	Bays	2 x External 5.25'' 2 x Internal 3.5'' 2x M.2 PCIe x4 Gen4 Slot for SSDs
9	Slots	1 x PCIe x16 Gen5 2x PCIe x4 Gen4 2 x PCIe x16 Gen4 All PCI Express slots should be open-ended.
10	Security	Optional BIOS controlled electro-mechanical internal chassis lock for the system, Solenoid Lock and Hood Sensor
11	Ports	Front : 4 x SuperSpeed USB Type-A 5 Gbps, 1 x Headphone/microphone combo Rear : 6 x SuperSpeed USB Type-A 5Gbps Signaling Rate , 1 x RJ-45 Integrated LAN Port (1GbE AMT), 1 x Audio Line-In / Out, 1 x 10GBase-T LAN port , SD Card Reader
12	Keyboard and Mouse	Minimum 104 keys USB Keyboard and USB Optical Scroll mouse - Same make as that of the workstation
13	Audio	High Definition Integrated Audio with Internal speaker.
14	Power Supply	Minimum 775W 90% Efficient Power Or Higher
15	Chassis	Tool less chassis with easy access. Provision for Kensington lock and Panel lock required. Integrated handles on the chassis. System should be rack-mountable
16	Operating System	Ubuntu Linux 22.04 or higher. System should certified for Red Hat® Enterprise Linux® Desktop 8 Or higher , SUSE Linux® Enterprise Desktop 15 ,Ubuntu 22.04 LTS or Higher

17	Additional Software	1. The hardware vendor should supply an automatic system performance tuning and monitoring software on Windows.
		2. The tuning software should have modules for resource monitoring over a long period of time, and should be capable of showing GPU utilization (GPU, Graphics memory and Codec activity) for both Graphics and GPU Compute cards.
		3. A complete Offline Diagnostics and Asset Discovery software suite should be supplied along with the system.
18	Monitor	Screen Size: 23"-28" or higher LED IPS monitor compatible with the motherboard supplied or higher.
		Panel: IPS, 3-sided micro-edge or higher
		Display Input Ports: 1 VGA; 1 HDMI 1.4; 1 DisplayPort™ 1.2; 4 USB-A 3.1 Gen 1.
		Integrated Speaker: Dual integrated Speaker or higher
		Camera: Integrated 5 MP Pop up IR camera or higher
Panel Features : Low blue light, Flicker free, Anti-glare features or higher		

		Security Features : Security lock-ready
		Contrast Ratio : 1000:1 static or higher
		Resolution : FHD 1920 X 1080
		Certificates : Energy Star, EPEAT & TUV
		Monitor cable should be compatible with Graphics card output. vendor should take care of any required hardware/ cable
		Terms & Condition : Monitor Should be Height Adjust, Tilt, Swivel, Pivot and same OEM Make
19	Warranty	5 years onsite parts and labor warranty for system and monitor, should be verifiable online on the OEM website. Product serial no's and warranty information should be available on OEM website clearly stating the start and end date with the technical configuration verification also being possible.
20	Vendor Status	The hardware vendor should be a reputed concern, having global presence in multiple countries. Vendor should have ISO certifications.
21	Features	Fan, Front Card Guide Kit and Memory Cooling Solution
22	Dust Filter	OEM should provide serviceable dust filter for avoid workstation failures due to dust and it should be connected into the workstation
23	Certifications	EPEAT GOLD, RoHS and UL Certified.

24	Additional Terms & Condition	<ol style="list-style-type: none">1. OEM authorization letter must be submitted against specific to this tender enquiry.2. Bidder & OEM Must have a dedicated toll free number & Service.3. Specific Data Sheet of the product(s) offered in the bid, are to be uploaded along with the bid documents. And should be available in the public domain.3. Average Turnover Should be minimum 1000 Core in last 3 Year OEM presence should be in India for at least 10 years or more, Letter of Incorporation to be attached4. Bidder Shall submit the Technical Compliance on OEM letterhead with sign & stamp.5. Bidder and OEM must have a Functional Office in the State of Consignee's Location, Bidder and OEM should have their business operation in India at least 7 years (Continuance Proofs are Required).6. Vendor Certification -ISO 9001, ISO 14001, ISO 20001, ISO 270017. "Non-end-of-life for 5 years", "Malicious code" and "Warranty Undertaking" Declaration Required from the OEM.8. Vendor and OEM both should have their service office in the state of Consignee for better support.8. Original OS will be preloaded from the OEM Factory, Declaration to be submitted along with bid.9. All Item should be of same OEM make and color, OEM should have same made of CPU, Mouse and Keyboard
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11. Specification for Refrigerated Table Top Micro centrifuge

- > System should have a Maximum Speed of 15,060 rpm/21,300 x g with a brushless motor and user defined RPM or RCF setting
- > Temperature range should be from -10°C to +40°C and should be able to maintain 4°C at maximum speed
- > System should have timer settings from 10 sec to 9:59 h, with continuous run function
- > System should have a maximum capacity 10 x 5 mL tubes
- > Rotor must be metallic and withstand autoclaving at 121°C for 20 mins
- > System should also have the provision to use both fixed angle and swing bucket rotor
- > Adapters to support tube formats like 0.2 mL, 0.5 mL should be available
- > Rotor lids should have a QuickLock-system for secure lid closing and opening
- > Aerosol tightness of the rotor should be certified by a third-party agency
- > System should be possible to operate the rotor even without rotor lid
- > System should have fast temperature function for rapid cooling of centrifuge
- > System should have an in-built condensate drain to prevent water accumulation inside the stainless rotor chamber to avoid corrosion
- > System should have automatic shut off function of the compressor to reduce energy consumption and to extend compressor life when not in use for long hours
- > System should be able to start the timer count only when the set centrifugation RPM is reached, to support the short spin protocols
- > System should possess a separate short spin key with defined maximum speed for brief spin
- > System should be possible to operate the centrifuge at set rpm, for short spin protocols
- > System should possess dedicated soft function to perform gentle acceleration and deceleration to enhance sedimentation
- > System must have finished time function to indicate time since centrifugation complete

- > System should support quiet operation in work place with noise levels <54 dB(A)
- > System must have an emergency lid opening in the front side
- > System should have bright digital display with LCD only
- > Instrument should be European CE Certified
- > System must have a USB-port for service maintenance
- > Warranty of at least one year from the date of successful installation in the lab

Rotors

- > Fixed angle rotor for 24 x 1.5 /2.0 mL tubes and adapters for 0.2 ml or 0.5 ml PCR tubes with aerosol tight lid with maximum of 15,060 rpm and 21,300 x g
 - Tube capacity: 24 x 1.5 /2.0 mL tubes and adapters for 0.2 ml or 0.5 ml PCR tubes
 - Rotor and rotor lid must be made of metal
 - Rotor with Aerosol-tight lid and supporting quick locking

12. Specification for Double beam UV- Visible spectrophotometer:

- System should have photometric system: Double beam optics
- Transmittance Range: 0 -199.9%
- Resolution: 0.1% T
- Accuracy: + 0.1 @ 10% T
- Stray Light <0.05% @ 3340 nm
- Absorbance Range: -0.300 to 3.000 A
- Resolution: 0.001 A
- Wavelength Range: -190 – 1100 nm
- Resolution: 0.1 nm
- Accuracy: +1.0 nm
- Spectral Bandwidth/Bandpass: Variable bandpass from 0.5 nm to 20 nm
- Max Scan Speed: 1400 nm/min
- Display LCD contrast and back light
- Light Source Tungsten/halogen and Deuterium.
- Quartz Cuvettes 0.1 ml, 0.5 ml & 1.0 ml.

13. Specification for Plate Centrifuge

- > Automatic rotor recognition
- > Foil keypad for programming and easy cleaning
- > Stores up to 50 routine programs
- > 'Fast Temp' for achieving required temperature in shortest possible time
- > 'Fast Temp pro' having the centrifuge refrigerated and ready-for-use at your desired pre-set time
- > Backlit graphical liquid crystal display
- > Low access height: 25cm
- > Technical specifications:
- > Maximum speed: 17,500rpm
- > Maximum RCF: 30,130 x g
- > Acceleration time to max.rpm: <14 s
- > Braking time from max.rpm: <15 s
- > Soft ramp: adjustable
- > Timer: 30 s to 99.59 h – continuous
- > Noise level - <54 Db
- > Temperature range: -11°C to 40°C
- > Dimension (WxDxH): 38 x 64 x 30 cm
- > Weight without rotor: 56 kg
- > System should have an in-built condensate drain to prevent water accumulation inside the stainless rotor chamber to avoid corrosion
- > System should have automatic shut off function of the compressor to reduce energy consumption and to extend compressor life when not in use for long hours
- > System should be able to start the timer count only when the set centrifugation RPM is reached, to support the short spin protocols
- Rotor FA-45-30-11 included

Features:

- > Max. speed: 20,817 x g (14,000 rpm)
- > Max. capacity: 30 x 1.5/2.0 mL tubes
- > Aerosol-tight for safe centrifugation of hazardous samples
- > Eppendorf Quick Lock lid for fast lid locking

- > Anodized aluminium for high chemical resistance

- Rotor A-2-MTP included

Features:

- > Max. speed: 2,204 x g (4680 rpm)
- > Max. capacity: 2 x MTP, PCR and Deepwell Plates (max.0.5 mL)
- > Windshield design for quiet operation

14. TECHNICAL SPECIFICATION OF WATER PURIFICATION SYSTEM

- The System should have high Quality Pre Filter with low pressure switch cuts off system which can be able to take care of high TDS up to 5000 ppm and high SDI up to 50 having 5 Micron and 1 Micron with DC diaphragm pump to boost water pressure from 0 to minimum 2.5 bar at approximately 120 L/Hr with noise levels of Less than 50 Db.
- The Main Unit Lab Grade Water Purification System should have Conductivity upto 2000 $\mu\text{S}/\text{cm}$, Fouling Index (SDI): upto 12, free chlorine upto 3 ppm.
- The product water and main unit should meet or exceed Type II water quality
 - a. Resistivity 5-15 Mega Ohms with Flow Rate - 3 Ltrs/Hr
 - b. No of Conductivity Cell in Type -II to ensure the Input& Output water quality- 3 Nos.
 - c. RO reject water recovery- up-to 50 %, before and after RO conductivity cell to know the % rejection of RO.
 - d. RFID Tag- for Traceability of pretreatment cartridge and every Liter throughput water volume should be seen on computer when connected through LAN. Date of installation also be seen on computer.
- LCD Display must show all below parameters

- a. Tap water feed conductivity.
- b. RO feed water conductivity.
- c. RO water temperature.
- d. RO pump pressure.
- e. RO % rejection value.
- f. RO permeate water conductivity.
- g. Tank level

- The tank capacity should be minimum 50 liters
- Ultra-pure water should meet

Typical Water Delivery Flow Rate (L/min)drop by drop to 1.6L/min

Ultrapure Water Resistivity (MΩ.cm at 25°C) 18.2

Microorganisms/bacteria (cfu/L) – < 1

Particulates < 0.22 μm (/mL) – None

Pyrogen Levels (EU/mL) –<0.001

RNase Level (pg/mL) –<1

DNase Level (pg/mL) –<5

Proteases < 0.15μg/mL

TOC (ppb) ≤ 5 ppb

Twist and lock mechanism for all the cartridges, so that user itself can replace it.

➤ **Mandatory Requirement**

- Minimum 10 appreciation letter of water purification system from any government organization in India.
- Service should be directly from the manufacturer's engineer should be based at Kolkata provide contact details. Call should be attended within 24 hours.