List of required machineries and equipment

Category 1

S. No	Equipment	Qty
1	Bench Mounted Centrifuge	1
2	Refrigerated Centrifuge	1
3	Blood Bag Tube Stripper	3
4	Microscope - Binocular (Laboratory)	1

Category 2

S. No	Equipment	Qty
5	Plasma Extractor	2
6	Plasma Thawing System	1
7	Water bath	1

Category 3

S. No	Equipment	Qty
8	Blood Bank Refrigerator (150 bags)	1
9	Ultra-Low Freezer (Plasma Storage)	1

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Technical specification for the machineries and equipment

1. BENCH MOUNTED CENTRIFUGE

GENERAL SPECIFICATION

- It should be Microprocessor Controlled with large Display of time, speed and error with buttons.
- Digital countdown timer with continuous run with range of 0 to 10 minutes of user selectable settings.
- Operation to change from RPM/RCF setting should be present.
- One-touch operation with pre-saved protocols.
- Brushless maintenance free motor drive with frequency drive, low noise level less than 58dB at Max speed.
- Automatic rotor recognition and automatic imbalance detection.
- Rotor and centrifuge Chamber should be made of chemical resistant and rust -free (stainless steel) and easy to clean.
- The body and lid can be Epoxy-polyester Powder Coated Steel.
- Safety lid interlock to prevent lid opening during centrifugation.
- Automatic door opening with emergency lid lock release facility.
- The higher Speed can be: Swing-out Rotor: 4500 rpm Angle Rotor: 16000 rpm
- Minimum RCF: Swing-out Rotor: 32602xg Angle Rotor: 2017xg
- Minimum Capacity Swing-out Rotor: 4x140 ml Angle Rotor: 6x50 ml
- Speed Accuracy: ±1rpm or ±1 x g
- Speed output should be stable even under fluctuating voltage conditions
- Profile selection: At least 3 user selectable acceleration & deceleration profiles
- It should have an option to store user defined program /minimum of 6 program.
- Inverter fault detection with auto shutdown, Dynamic brake for quick deceleration
- Gas hinge to prevent door falling
- Acceleration / braking profiles, 9 acceleration and 10 braking curves
- Speed Set range: 500-14000 rpm
- Speed Set step: 10 rpm
- Run time 9 hr. 99minutes plus Hold Position.
- It must include all standard accessories desired for proper functioning of the machine as per requirement.

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ACCESSORIES

1) Swing out Rotor
2) Round bucket set of 4
3) Bio-contaminant lid
4) Suitable adaptors 24x5/7ml blood collection tube.

POWER SUPPY REQUIREMENT

- Power input to be 220-240 VAC, 50Hz fitted with UK Plug.

SAFETY STANDARD AND TRAINING

- Should be UFDA, CE, UL approved (valid documentation should be submitted in technical bid).
- Manufacture should meet the safety standards IEC 61010-1, IEC 61010-2-020 (valid documentation should be submitted in technical bid).
- Comprehensive training for Operator and Services Support for In- House Biomedical Engineer.
- 24 months warranty after the successful installation. (mandatory)
- Availability Spare parts and all other accessories must be for 10 years.

DOCUMENTATION

- Certificate of calibration and inspection.
- List of Equipment available for providing calibration and routine Preventive maintenance support as per manufacturer guideline.
- List of important spare parts and accessories with part number and costing.
- Log book with instruction for daily weekly monthly and quarterly maintenance checklist.

ADDITIONAL CONDITIONS

- Detailed service manual and operation manual should be provided by the supplier or manufacturer.
- Original catalogue with detailed literature should be provided.
- A written commitment of maintenance during and after the warranty period.
- Manufacturer/Supplier should install and successfully run and demonstrate the instrument.
- The unit should only be supplied with specific rotor, all required adaptors, sealing caps and bucket, prefer to have **swing out rotor.**
- Preferred country of origin -UK, USA, GERMANY, JAPAN
- The supplier should have submitted the authorization letter from the manufacturer.

2. REFRIGERATED CENTRIFUGE

GENERAL SPECIFICATION

- It should have digital display and touch screen to indicate selected Program, Speed, Time, RCF, Temperature.
- Centrifuge should be operational at a temperature range of -20 to + 40˚ C, adjustable to 1°C along with short spin key, fast cooling & stand-by cooling option, 10 acceleration & deceleration rates with at-least 35 program memory.
- Preferrable time cycle range from 1 to 9hr 59min. 7,295 x g
- It must be equipped with high torque brushless drive technology.
- Blood banking Capacity 8 X 550ml.
- Provision to adjust the speed in RPM & RCF, minimum
    - 5000 rpm & 7295xg rcf.
- Inbuilt ability for correct rotor recognition and Imbalance sensor/alarm.
- Green Technology – Automatic Refrigeration off when door opens.
- Special Functions: Onboard Training videos, User Logging, Automatic Door opening, Onscreen display for imbalance, over temperature, guidance display for error message.
- There should be visual display and audible alarm when there is an abnormal condition.
- The instrument should have an option of manual lid opening in case of power failure so that samples can be retrieved easily with tool from front or side of the machine.
- It should have built-in condensation drain to eliminate excess water to prevent corrosion.
- Rotors and buckets to be supplied with machine /angle rotor.
- All rotors, buckets should be metallic. Rotors, caps, buckets and adaptors must be autoclavable.
- The centrifuge body must be made from high quality steel, safe and reliable.
- It should have CFC free refrigerant with an ozone depletion potential (ODP) of zero.
- The operating noise level must be below 65dB.
- Possibility of precooling during standstill.

POWER SUPPY REQUIREMENT

- Power input to be 220-240 VAC, 50Hz fitted with UK Plug.
- If stabilizer is required it must come with instrument.

SAFETY STANDARD AND TRAINING

- Should be FDA, CE, UL of BIS approved (valid documentation should be submitted in technical bid).
- Manufacture should have ISO certificate for quality standards (valid documentation should be submitted in technical bid).

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- Comprehensive training for Operator and Services Support for In- House Biomedical Engineer.
- On site Comprehensive warranty for 2 years for unit, 5 years for motor shaft and drive, 5-year refrigeration (Mandatory).
- Availability Spare parts and all other accessories must be for 10 years.

DOCUMENTATION

- Certificate of calibration and inspection.
- List of Equipment available for providing calibration and routine Preventive maintenance support as per manufacturer guideline.
- List of important spare parts and accessories with part number and costing.
- Log book with instruction for daily weekly monthly and quarterly maintenance checklist.

ADDITIONAL CONDITIONS

- An English version of detailed service manual and operation manual should be provided by the supplier or manufacturer.
- Original catalogue with detailed literature should be provided during proposal submission.
- A written commitment of maintenance during and after the warranty period with accessories and Spare parts availability up to 10 years.
- Preferred country of origin, USA, UK, GERMANY, JAPAN

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3. BLOOD BAG TUBE STRIPPER

Purpose of Equipment:

The blood bag tube stripper is a “plier-like” tool, intended to be used with PVC blood tubing, to strip undiluted blood from the donor tubing. It can be used with different sizes of blood bag tubes due to the screw mechanism that allows to adjust the distance between the rollers.

GENERAL SPECIFICATION

- It must be lightweight (~125 g)
- Diameter of the rollers: 12 mm
- It must be compatible for various size of blood tube

4. MICROSCOPE – BINOCULAR

GENERAL SPECIFICATION

- The Optical system must be colour Corrected Infinity Optical System (CCIS).
- The Observation tube should be binocular head with feature of Siedentop type.
- The Inclination is 30º inclined and 360º rotatable.
- The Interpupillary distance should be 50-75mm.
- The Diopter adjustment should be possible on both eyepieces, +/- 5 diopter.
- There should be a Widefield Eyepieces N-WF10X/22mm with diopter adjustment.
- Nosepiece: Reversed sextuple
- The mandatory Objective lenses are 4X/0.10 (WD 15.9mm), 10X/0.25 (WD 17.4mm), 40X/0.65/S (WD 0.5mm), 100X/1.25/S-Oil (WD 0.15mm)
- The Objective mounting thread W 4/5"x1/36" (RMS standard)
- Stand type - Upright
- The Mechanical stage should be built-in low position rackless coaxial stage control, ceramic insert and sample holder
- The preferred Stage size 180x170mm
- Travel range X&Y 80x55mm
- The Condenser must be Focusable and centerable Swing-out Abbe condenser N.A. 0.90/0.13
- The Diaphragm must be Iris diaphragm
- Focus mechanism Coaxial coarse and fine focusing system with tension adjustment
- Fine focus precision 1µm
- Focusing stroke 27mm
- Standard contrast technique -Brightfield
- Upper limit stop must be preset and adjustable
- Filter holder on top of the illuminator with fixing cap
- Transmitted illumination Koehler Quartz halogen 12V/100W with intensity control
- There should be a special attention called Illumination feature, Auto-OFF and Light Memory function, External lamphouse.
- Accessories included Dust cover, power cord, Allen key, immersion oil (5ml), blue filter, spare fuse, arm rest
- The preferred dimensions 592x242x435mm (LxWxH)
- Net weight 14.2kg.

POWER SUPPY REQUIREMENT

- Power input to be 220-240 VAC, 50Hz fitted with UK Plug.

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SAFETY STANDARD AND TRAINING

- Should be FDA, CE, UL of BIS approved (valid documentation should be submitted in technical bid).
- Manufacture should have ISO certificate for quality standards (valid documentation should be submitted in technical bid).
- Comprehensive training for Operator and Services Support for In- House Biomedical Engineer.
- On site Comprehensive warranty for 2 years (Mandatory).
- Availability Spare parts and all other accessories must be for 10 years.

DOCUMENTATION

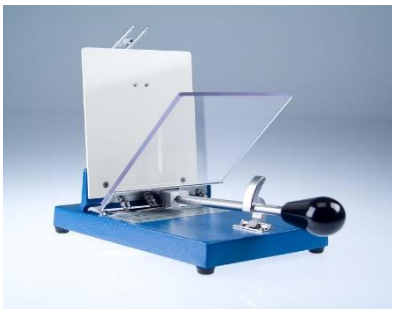
- Certificate of calibration and inspection.
- List of Equipment available for providing calibration and routine Preventive maintenance support as per manufacturer guideline.
- List of important spare parts and accessories with part number and costing.

ADDITIONAL CONDITIONS

- An English version of detailed service manual and operation manual should be provided by the supplier or manufacturer.
- Original catalogue with detailed literature should be provided during proposal submission.
- A written commitment of maintenance during and after the warranty period.

5. PLASMA EXTRACTOR

Purpose of Equipment: Plasma expressor is an equipment used for separating plasma, platelets and red blood cells. It is useful for all types of blood bag. It is a mechanical device, which exerts uniform pressure on the blood bag during the separation of components.



GENERAL SPECIFICATION

- It should have a stainless steel spring-loaded acrylic plate which exerts uniform pressure on the blood bag.
- **Mode of operation:** Manual
- Transparent plate allows easy visibility of the bag contents.
- Accommodates all types of blood bags up to volumes of 500 mL
- It must have a handle with ball end provides a comfortable grip.
- Hook keeps the handle in place before and after expression.
- Easy to transport.
- Backplate with suspension pins to secure Blood-Pack Unit Anti-slip feet keep unit in place Serialized medical device with powder coated base for durability.

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6. PLASMA THAWING SYSTEM

GENERAL SPECIFICATION

- It should be equipped with a Microprocessor temperature controller with audible and visual high temperature alarm.
- LED digital temperature display.
- Should be able to thaw 4/8 plasma bags (FFP / Apheresis or plasma bags of any size)
- The design must be table top with top opening
- Internal Body Material: Stainless steel (Non corrosive, Non-Magnetic)
- Having a deep thawing chamber with a stirrer and with water maintained at +37˚ C with pumping mechanism and in-line hating to ensure uniform thawing.
- Should be a water bath-based system operating at a preset and precise temperature of 37˚C ±2˚ C
- Rapid Thaw Time
- chamber volume should not exceed 32L.
- Two thawing baskets with independent controls provides the ability to thaw separate orders at the same time.
- It should offer superior construction.
- Should have two separate basket assemblies with built-in fingers for security holding the plasma bags of all sizes.
- Should give an alarm when the plasma bags are thawed.
- Provision for programmable time setting for length of thawing.
- Should have digital timer clearly displaying the programmed set time or remaining cycle in minutes.
- Should have a system to drain the chamber easily.

Standard Accessories

The unit must be supplied with the following accessories

1. Additional digital thermometer with LCD display.
2. Plasma overwraps- standard size / have to ensure minimum quantity of 200 pieces.
3. Chamber cover to prevent accidental falling of any particle or to limit evaporation.

DIMENSIONS

Overall Exterior (w x h x d) in (mm)

(Includes baskets extended, drain port, plasma overwrap holder, switches)

21.75 x 23 x 15.5 / (552 x 584 x 394)

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POWER SUPPY REQUIREMENT

- Power input to be 220-240 VAC, 50Hz fitted with UK Plug.

SAFETY STANDARD AND TRAINING

- Should be UFDA, CE, UL of BIS approved (valid documentation should be submitted in technical bid).
- Manufacture should have ISO certificate for quality standards (valid documentation should be submitted in technical bid).
- Comprehensive training for Operator and Services Support for In- House Biomedical Engineer.
- On site Comprehensive warranty for 24 months(mandatory).

DOCUMENTATION

- Certificate of calibration and inspection.
- List of Equipment available for providing calibration and routine Preventive maintenance support as per manufacturer guideline.
- List of important spare parts and accessories with part number and costing.
- Log book with instruction for daily weekly monthly and quarterly maintenance checklist.

ADDITIONAL CONDITIONS

- An English version of detailed service manual and operation manual should be provided by the supplier or manufacturer.
- Original catalogue with detailed literature should be provided during proposal submission.
- A written commitment of maintenance during and after the warranty period with accessories and Spare parts availability up to 10 years.
- Preferred country of origin -UK, USA, GERMANY, JAPAN
- The supplier should have authorization Letter from the manufacturer.

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7. WATER BATH

GENERAL SPECIFICATION

- The water bath must be equipped with a microprocessor system to achieve a precise temperature, also a timer to observe the set protocol.
- Over-temperature safety circuitry is necessary to prevent thermal runaway.
- The product exterior mut be epoxy powder-coated it benefit from outstanding chemical and corrosion resistance also the inner surface structure must be made from high quality stainless steel.
- It should have a monochrome LCD to display the set temperature and time.
- The alarm must be audible when the set protocol is completed.
- The prefer tank volume should not exceed 20L.
- Temperature range Ambient to 100degree Celsius., Time range -1 minute to 99,9 Hours + hold position
- Heating time：≤ 30 min (25℃~100℃)
- Temperature Uniformity ±0.2°C at 37°C
- Temperature Stability ±0.1°C at 37°C
- It should have a built-in water level detection device to prevent the danger of dry burning.
- It should have provision for drainage.

POWER SUPPY REQUIREMENT

- Power input to be 220-240 VAC, 50Hz fitted with UK Plug.
- If stabilizer is required it must come with instrument.
- Power consumption should not cross more than 1500W

SAFETY STANDARD AND TRAINING

- Should be FDA, CE, UL approved (valid documentation should be submitted in technical bid).
- Manufacture should have ISO certificate for quality standards (valid documentation should be submitted in technical bid).
- Comprehensive training for Operator and Services Support for In- House Biomedical Engineer.
- On site Comprehensive warranty for 2 years (Mandatory).
- Availability Spare parts and all other accessories must be for 10 years.

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DOCUMENTATION

- User/Technical/Maintenance manuals to be supplied in English.
- Certificate of calibration and inspection.
- List of Equipment available for providing calibration and routine Preventive maintenance support as per manufacturer guideline.
- List of important spare parts and accessories with part number and costing.
- Log book with instruction for daily weekly monthly and quarterly maintenance checklist.

8. BLOOD BANK REFRIGERATOR (150 BAGS)

Purpose of Equipment

A refrigerator (Upright model) for storing whole blood or red cell packs in a blood bank. Must be designed specifically for blood bank use. Commercial (or) modified commercial refrigerators for other purpose are not acceptable.

GENERAL SPECIFICATION

- The system should have an intelligent user interface with high-definition LCD touch screen to display temperature graph, working status, events and alarm record.
- The system can have a microprocessor-based LED controller to show the temperature, working status, and alarm.
- Capacity: Should be able to accommodate 150 standard blood bags for each of 350ml/450 ml capacity or 350-400 litters' net volume.
- The system should be microprocessor control and digital display ensures the inside temperature at 4±1 ℃ with 0.1 ℃ resolution.
- Temperature range can be +2˚C to +7˚C & set point must be +4˚C
- Hold over Time: A full load of blood packs at +4 o C (+1 o C) takes at least 30 minutes to rise to above +6 o C. Internal temperature hold over time in case of power failure should be at least 90 minutes
- It must be equipped with multiple sensors placing inside the liquid-loaded monitor bottles, to constantly monitor the temperature inside.
- Large, easy-to-read digital display that shows temperature within 0.1°C
- It should have a temperature chart recorder.
- It should have a multi air-flow plenum system ensures excellent temperature uniformity.
- Cooling method: Forced Air Cooling System
- Sensor Type: NTC
- Refrigerator must include heavy-duty, medical-grade, hermetically sealed compressors and automatic condensate removal and defrost systems.
- The Inner doors must be transparent to minimize the air leakage during door open.
- Should be compatible to install remote alarm system to inform the users on phone if the case of temperature change.
- The system should have electrical heater prevents condensation on glass door.
- The unit must be equipped with High-density, CFC-free urethane foam insulation to protects cabinet from ambient temperature fluctuations and minimizes operating costs.
- Battery backup for alarm and temperature recording device with minimum 4 hrs. battery backup.

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The design must meet the following things.

1. Interior – Stainless steel/ anti-rust, anti-corrosion.
2. Exterior -Epoxy coated/ anti-bacteria, easy cleaning.
3. Have powder coated ventilated drawers(or) self-adjustable coated steel wired shelves.
4. Lockable caster for easy moving and stop.
5. Interior LED light for clear display.
6. Self-close door.
7. Cabinet type: upright
8. Organic glass window for better visibility of the refrigerated content.
9. Sealed gaskets and 5-layer glass window minimizing cold air loss.
10. Number of drawers 5
11. Minimum Gross volume 297L and above
12. Minimum Storage capacity 269L.
13. Approximate interior dimensions*: 530*490*1145 (W*D*H) mm*
14. *Approximate external dimensions: 640*760*1856 (W*D*H) mm*

The following safety features must be included.

1. Password protection to prevents unauthorized setting.
2. Safety lock prevents to unauthorized access.
3. Audible/visual warnings for temperature deviations.
4. Power failure protection.
5. Start delay function protects the equipment from overload when power resume.
6. Facility for remote alarm contact.
7. Auto-defrost function.

- It must use environment friendly refrigerant: CFC-Free and HCFC-Free
- Cooling Down Time: A full load of blood packs at +25 °C should not take more than 13hrs for all the packs to reach below +6 °C
- Noise level less than 35dB.
- External Ambient temperature range: +10˚C to +32˚
- All standard accessories must be supplied along with the unit which can be include temperature chart recorder, shelfs and baskets, LED lamp, Probe, access port and Door key.

POWER SUPPLY REQUIREMENT

- Power input to be 220-240 VAC, 50Hz fitted with UK Plug.
- If stabilizer is required it must come with instrument.
- Power consumption 1.8kWh/24h (50Hz)
- The refrigerator must be supplied only with rated UPS to provide the backup when there is a power failure.

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SAFETY STANDARD AND TRAINING

- Should be FDA, CE, UL of BIS approved (valid documentation should be submitted in technical bid).
- Manufacture should have ISO certificate for quality standards (valid documentation should be submitted in technical bid).
- Comprehensive training for Operator and Services Support for In- House Biomedical Engineer.
- On site Comprehensive warranty for 5 years (Mandatory).
- Recommended list of spare parts and all other accessories must be available for 10 years.

ADDITIONAL CONDITIONS

- The unit should supply along with all necessary accessories without an extra cost.
- An English version of detailed service manual and operation manual should be provided by the supplier or manufacturer.
- Original catalogue with detailed literature should be provided during proposal submission.
- A written commitment of maintenance during and after the warranty period.
- Certificate of calibration and inspection.
- List of important spare parts and accessories with part number and costing.
- Log book with instruction for daily weekly monthly and quarterly maintenance checklist
- External digital thermometer should be supplied.

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9. ULTRA LOW FREEZER (PLASMA STORAGE)

Purpose of Equipment

Plasma Storage Freezers are devices intended for the safe storage of frozen blood plasma or blood components at temperatures below -27°C. Must be designed specifically for blood bank use. Commercial (or) modified commercial Freezers for other purpose are not acceptable.

GENERAL SPECIFICATION

- The system should have an intelligent user interface with high-definition LCD touch screen to display temperature graph, working status, events and alarm record.
- An upright ultralow temperature freezer (-86˚C) of 300-350 litters capacity.
- Should have the microprocessor Temperature Controller.
- The freezer should be supplied with chart recorder, which ensure continuous monitoring.
- The Chart range −100 °C to +50 °C
- The Chart duration 7 days
- There should have an automatic evaporation of condensate and auto defrost system.
- The freezer must be frost free and must be equipped with a dual cooling system.
- Freezer should have at least 3 compartments, each with individual inner doors.
- Approximate Storage capacity per compartment can be 50 bags.
- Interior of the freezer should be stainless steel to prevent scratches, rust and oxidation.
- Insulation of the freezer should be made of polyurethane foam with a minimum of 125mm thickness.
- Freezer should have programmable operating temperature from -20˚C to -86˚C with 1˚C increment along with programmable microprocessor controlled with membrane keypad and eye level control panel.
- It should have multiple sensors to constantly monitor the temperature in both the upper and the lower part of chamber.
- Alarm limits: - 87°C | - 77°C
- *Ambient temperature range): +10°C to +43°C*
- System should have pull down timing of less than 6 hrs. from ambient temperature
- to -86˚C.
- It should have heated air vent or vacuum release port and front mounted filter.
- Triple rubber gasket sealing, to keep the plasma products completely protected in the freezer. The seal reduces humidity migration into the interior and preserves the cold air inside the cabinet.
- Freezer should have security key locks on the outer doors.

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- System should have diagnostic software to identify any fault.
- System should have adjustable audible and visible alarms for temperature, power failure, system failure, battery low etc. also it should have an option for remote alarm port.
- System must use CFC-FREE, HCFC- FREE non-flammable refrigerants and refrigeration.
- System must be energy efficient refrigeration system.
- Compressor should be capable to run any voltage between 210-250V.
- It must have a lockable imported caster wheels that makes moving the deep freezer around in blood banks easy.
- Freezer must meet ISO 9001 standard quality test requirements and IEC61010 Electrical safety European CE & UL certified.
- Freezer should have efficient power consumption not more than 14 KW/day, preferably in the range of 10 to 13 kW/day.
- System should have single condenser fan reducing energy consumption and made of recyclable material.
- System should be supplied with fitting SS racks of sufficient numbers to cover all the inner compartments.
- The system should be supplied with Cryo gloves to ensure cryogenic protection in ultra-cold environments. Preferred sizes are **S, M, L,**
- Should be compatible to install remote alarm system to inform the users on phone if the case of temperature change.
- Warranty and Comprehensive Maintenance Contract: Instrument must be supplied with 5 years warranty from the date of installation and 5 years annual maintenance contract from the date of expiry of the warranty.

DIMENSIONS

- The approximate External dimensions (W × D × H) 805 × 825 × 1940 mm with casters.
- The approximate Internal dimensions (W × D × H) 550 × 500 × 1190 mm
- Approximate weight 350kg.

POWER SUPPY REQUIREMENT

- Freezer should have electric supply of 230v/50Hz, 10 amps, single phase.
- System should be supplied with suitable servo voltage stabilizer.

SAFETY STANDARD AND TRAINING

- Should be FDA, CE, UL of BIS approved (valid documentation should be submitted in technical bid).
- Manufacture should have ISO certificate for quality standards (valid documentation should be submitted in technical bid).
- Comprehensive training for Operator and Services Support for In- House Biomedical Engineer.

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- Availability Spare parts and all other accessories must be for 10 years.

DOCUMENTATION

- Certificate of calibration and inspection.
- List of Equipment available for providing calibration and routine Preventive maintenance support as per manufacturer guideline.
- List of important spare parts and accessories with part number and costing.
- Log book with instruction for daily weekly monthly and quarterly maintenance checklist.

ADDITIONAL CONDITIONS

- The unit should supply along with all necessary accessories for a successful installation without an extra cost.
- An English version of detailed service manual and operation manual should be provided by the supplier or manufacturer.
- Original catalogue with detailed literature should be provided during proposal submission.
- A written commitment of maintenance during and after the warranty period.