Technical Specifications of

Equipment in the TB Culture and DST Laboratories under RNTCP (January 2017)

Contents

Autoclave (Horizontal)

Description of function and use: Applications:-

- For sterilizing non infective material and aqueous media in loosely stoppered flask.
- For drying of racks and porous loads by vacuum and intake of filtered air.
- For larger workloads in the laboratory.

Main specifications

- Made of Stainless Steel of SS-304 grade, Triple walled with a steel jacket
- Separate boiler with manual water feed control (valve) with water level indicator and pressure gauge, separate compound gauge for working chamber, separate manual valve for drainage of water.
- Inner, outer chamber, jacket and boiler made of stainless steel 304 grade, manual steam release valve for chamber
- Inner dimensions of chamber: 300-320 L

Safety features to include;

- Spring loaded safety valve of stainless steel for both boiler and working chamber
- Automatic Low Water Cut-off Device – To protect the heaters from running dry and to ensure that the machine is automatically switched off in case the desired water level falls below the prescribed level
- Auto safety door lock with heat resistant silicone door gasket (withstanding temp up to 140°C)
- Over temperature and pressure protection
- External Validation port for measuring temperature of the working chamber
- Mounted on rigid tabular stand
- There should be provision for vacuum for drying of racks and porous loads.
- Working temperature: 121°C, Maximum operating temperature: 134 °C (273 °F).
- Working pressure: 1.2 -1.5kg/sq. cm. Maximum operating pressure: 2.5 kg/sq.cm

Automatic Pressure Control Switch- To cut-off the current from the heating elements, when the desired/ set pressure value level is attained inside the chamber and restarts the mechanism once the pressure inside the chamber falls from the desired level. The pressure is adjustable from 5 psi to 20 psi with automatic pressure control switch, which controls the pressure with an accuracy of +/- 1 PSI

Temperature Indicator - To indicate the temperature inside the chamber.

Timer with Alarm System - To regulate the sterilization time of the media to be sterilized and when the desired time is passed, with a buzzer, to that the completion of sterilization cycle, Sterilization timer: 1–99 minutes.

Electrical requirements - Equipment to work on 440 ± 10 volts Three phase with neutral, 50 Hz, AC power supply, plug type adopted to local country scenario (MCB) with suitable voltage regulator of appropriate rating. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

Accessories - To be suppled include stainless steel drums (where 2 fit in autoclave directly plus two spare total 4), stainless steel wire basket (where 2 fit in autoclave directly plus two spare total 4), Chemical indicator tape for sterilization (2), Biological indicator (100), spare heating elements (two), fuses (10), Silicone door gasket (2).

Remarks - The apparatus should confirm to national or international standards with latest amendments covering Markings, Safety requirements with recommendations of safe operations from any reputed firm with ISO
9001:2000 certification.

Autoclave (Vertical)

Description of function and use: Autoclaves are used for sterilization of infectious or clean materials.

- For effective sterilization for smaller work load.
- For decontamination of infected material prior to its disposal.
- For faster work in the laboratory.

Main specifications

- Vertical autoclave, universal basic version for microbiological standard laboratory to sterilize liquids, instruments, glassware, plastic articles or general infectious waste.
- Triple walled construction; chamber, basket, door lid, doorframe, bolts made of corrosion-resistant material and able to prevent stress cracking preferably made of high grade stainless steel sheet of SS-304 grade. Housing with SS legs
- Pressure vessel should be Hydraulic tested at factory with minimum Hydrostatic Pressure: 2.5 kg/cm sq. (35 psi)
- Working Chamber volume: approx. 70 -80 liters.
- Electrically heated by immersion type heaters bearing ISI mark.
- Fast safety lid lock with silicone gasket, it may be radial locking, automatic locking, single lever locking, fly nut assembly mechanism and with heat resistant/safety handle.
- Manual water feed system with water level indicator, pressure gauge, steam release cock, spring loaded safety valve, water inlet and water valves
- Accessories to be supplied include stainless steel basket (where 2 fit in autoclave directly plus two spare total 4), stainless steel wire basket (where 2 fit in autoclave directly plus two spare total 4), Chemical indicator tape for sterilization (2), Biological indicator (100), spare heating elements (two), fuses (10) and silicone gaskets (2).
- Automatic Water Cut-off Device – To protect the heaters from running dry and to ensure that the machine is automatically switched off in case the desired water level falls below the prescribed level
- Working temperature: 121°C, Maximum operating temperature: 134 °C (273 °F).
- Working pressure: 15 PSI, Maximum operating pressure: 2.5 bar or 36 PSI

Timer with Alarm System - To regulate the sterilization time of the media to be sterilized with a buzzer, Sterilization timer: 1–99 minutes.

A visual chamber gauge, which easily identifies pressure in the chamber must be accessible to the operator as a backup for reading pressure gauge when no electrical power is available.

Micro-processor temperature control system with sensor-with user changeable set temperature and timer option. The microprocessor controls the desired temperature (pressure automatically regulated) by cutting off the current to the heating element automatically & restart the mechanism as required. The control panel to be mounted so that the components sensitive to steam and heat are protected. Large LCD display showing:

- Chamber Temperature
- Sterilization time
- Alarm information.

Alarm: audible, with display on dysfunction & after completion of sterilization cycle.
Electrical control box, fitted with toggle switch, indicating Neon lamps for Autoclave ON/OFF status, heater ON/Off status.
Over-temperature and over-pressure protection limiter

Electrical requirements: Equipment to work on 230 ± 10 volts single phase, 50 Hz, plug type adopted to local country scenario, Voltage regulator of appropriate rating to be included to cope with 160-260 V. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

Remarks: The apparatus should confirm to national or international standards with latest amendments covering Markings, Safety requirements with recommendations of safe operations from any reputed firm with ISO 9001:2000 certification.

Air Conditioner (Split AC with Voltage Stabilizer, Capacity: 1 ton, 1.5 ton and 2 ton)

Description of use and function: Air conditioner will be used in various sections of the lab where air conditioning is necessary for activities performed in the section ex GeneXpert Room, Equipment Room, etc.

Technical Specifications:

1. Air conditioners suitable for 230V, 50 Hz single phase. AC supply shall be capable of performing the functions as cooling, dehumidifying, air circulating and filtering. The air conditioners shall be complete with automatic temperature control and cut-in and cutout etc. for temperature range 16 to 30 degree C. The differential of the thermostat for cut-in and cut-out shall not be greater than +/-1.75 degree C.
2. The Air conditioners may either be provided with adjustable step less type mechanical thermostat or electronic thermostat as per IS: 11338:1985.The ECO friendly air conditioners shall have ECO MARK from Bureau of Indian Standards.
3. Outdoor unit of the air conditioners shall be fitted discharge cooled type rotary compressor operating on Refrigerant R-22 (or non-CFC refrigerant R-410 in case of Eco friendly Split Air Conditioner) with suitably rated capacitor start electric motor. It shall be equipped with overload protection and shall be mounted on resilient mountings for quiet operation. The Rotary compressor shall be of Matsushita/Hitachi/ Toshiba/ Carrier/ Emerson/ LG /Tecumseh make and shall be covered by manufacturers test certificate and TTC to JISS or ASHRAE.

4. The minimum thickness of the base in outdoor unit shall be 1.20 mm & sheet thickness for rest of the body shall be 0.70 mm (Min.) with galvanized coating thickness of 120 g/ sq. m and shall be provided with stiffeners for robust construction and shall have rounded corners. Galvanized sheet shall conform to IS: 277/2003. Steel parts/front panel etc. shall have stove-enameled finish preceded by thorough cleaning of the surface, phosphating and undercoat of anti-corrosive primer paint. Alternate methods of corrosion protection like plastic powder coating, electrostatic paintings shall also be acceptable in lieu of stove-enameled finish.
5. The casing of the indoor units shall be made of ABS/HIPS/GS and shall be impact resistant. The control box of indoor unit shall withstand flame retardant test to Grade V-O as per UL-94. For impact resistance the unit duly packed and dropped from a height of 1 m shall show no damage. The filter pads provided shall be washable.
6. Remote cordless control with LCD/LED Display shall be provided with one On/Off timer, selecting fan speed (three speed) and setting up of temperature. Display shall be provided on indoor unit or on handset or on both.
7. Maximum power consumption of the split air conditioners shall be measured at capacity rating test conditions. Overall power factor of the unit shall be at least 0.85 at capacity rating test conditions.
8. The units shall have minimum 3 star rating certified by BEE, for energy efficiency.
9. Servicing: Free servicing shall be provided for 15 months from the date of dispatch or 12 months from the date of installation of air conditioner whichever is earlier. Firm is also required to send service engineer at least 3 times during the warranty period.

10. **Warranty:** Warranty shall be provided for 3 years from the date of installation of air conditioner, whichever is earlier. The compressor shall have additional Warranty of 4 years (In addition to above warranty of 3 years on whole unit.)

11. **Installation**: The installation charges consignee's site shall include the following work:
    a) Mounting/Fitting indoor and outdoor units at the respective locations.
    b) Laying refrigerant piping of 4mtrs length and connecting both the units after drilling hole/holes in the wall, if required. The thickness of the copper tubing shall not be less than 0.70mm. Connecting copper tubing shall have dimensions suitable for the compressors offered with model.
    c) Insulating the suction pipe with expanded polyethylene foam with 9 mm thick tubing.
    d) Laying 15mm drain pipe upto 10m length to drain out the condensate water being formed in the indoor unit.
    e) Leak testing of the entire system.
    f) Charging Refrigerant gas in the unit.
    g) Suitable electric wiring between indoors and outdoors units up to 10 mtrs length up to switch within 3 m of location of indoor unit.
    h) Good quality 15amp plug and 32A MCB (appropriately reduced capacity for 1 ton AC) with Box for electrical connection of the stabilizer

12. **Stabilizer for Split AC of capacity 1 ton, 1.5 Ton and 2.0 Ton**
    a) Minimum Input Power (V): 170 V

b) Maximum Input Power (V): 270 V
c) Over Volt Protection
d) Under Volt Protection
e) Built In Thermal Overload Protection - Protects the stabilizer and compressors during high temperature burnout.
f) Time Delay System for the compressor proper balancing time in power cuts.
g) Wall Mountable

13. **Cooling Capacity Calculation**: For each site location, the actual cooling capacity requirement shall be calculated as per ASHRAE guidelines considering factors like the ambient conditions, room size, ceiling height, floor level, windows and glass, lighting load, occupancy factor, equipment load etc., before supplying and installing the Split AC units.

Balance- Analytical Balance

Description of function and use: An analytical balance is needed to prepare media containing drugs, for DST. The balance may also be used to calibrate, recalibrate and maintain microliter pipettes used in the laboratory, especially for molecular biology. Temperature variation and static electricity will cause analytical balances to display erratic readings. Therefore, the balance is to be operated on an antistatic surface, in a room with a constant temperature and a steady relative humidity of >65%.

Main specifications

- Weighing capacity range: 1 mg to at least 200 g.
- Tare range = full capacity by subtraction.
- Stabilization time: ≤5 seconds.
- Housing resistant to chemicals and cleaning materials.
- Glass doors (not plastic) that close tightly.
- Stainless steel weighing pan, approximately 80 mm diameter.
- Full glass windscreen, able to be opened on both sides and from the top cover.
- Adjustable feet (so the balance can be levelled).
- Waterproof display and keypad, sealed by a durable flexible membrane.
- Background illuminated (backlit) display with digits at least 15 mm high.
- User-friendly menu (preferably in different languages but at least in English) so the balance can be configured to individual requirements.
- Level indicator to be close to the display or in the view field of the display.
- Built-in motorized calibration of weight with automatic adjustment (or calibration using an external standard weight).
- Readability: 0.0001 g (0.1 mg).
- Repeatability: 0.0001 g (0.1 mg).

- Linearity: 0.0002 g (0.2 mg).

Electricity requirements

Supply voltage: 230 ± 10 V, AC, 50/60 Hz.
Voltage and plugs to be adapted to meet the country requirements. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

Power consumption: Low.
- Protection class (in accordance with EN 60529)
- Designed not to interfere with circuit radio (in accordance with EN 55014)

Documentation

Manufacturer's certificate
The manufacturer must have a management system certified to ISO 9001. The manufacturer to provide a declaration of conformity to standards that apply to the product, including ingress protection rating and weight classifications and applications.
One certificate to state that the balance has been calibrated at the factory. Certificates to be provided for each item supplied.
Quality and safety standards met by the product must be listed.

Accessories

- Balance table with vibration bumpers, preferably granite isolator.
- Protective dust cover.
- Optional: Weighing scoop, 90 mm, stainless steel.

Operation, installation and maintenance

Installation and maintenance
- The bidder must arrange for the equipment to be installed by certified or qualified personnel at the place indicated, free of cost. Detailed installation prerequisites to be communicated to the purchaser in advance, especially for the electric power supply needed, including type of plug (or other way of connection).
- Detailed instruction of laboratory personnel on use, function and maintenance of the equipment (user training), as well as a comprehensive maintenance plan (logbook with daily, weekly, monthly and quarterly maintenance checklist), to be provided.
- The cost of the maintenance plan to be defined and guaranteed over the period of warranty.
- The supplier to provide a functioning after-sale service covering the whole country. The service to have adequate infrastructure, competent staff and sufficient spare parts to be able to respond to any complaints and to repair or replace the balance within 14 days.

Standard maintenance tools

All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer. Bidders must specify the quantity of every item included in their offer (including items not specified above).

Spare parts
Each balance to be accompanied by an authorized list of accessories and spare parts.

Warranty: At least three years.

Remarks: The equipment offered, including its power supply, to be designed and constructed to operate properly and continuously in the conditions of the purchaser's country; the equipment may need to tolerate high humidity (as high as 90% at 35 °C), ambient temperatures of 5–40 °C, fungi, and spikes in the electricity supply.
Bidders may propose products additional to the requirements listed above.

Balance- Precision Balance

Description of function and use: A precision balance is mainly used to weigh dyes for staining solutions and components for culture media. Temperature variation and static electricity will cause precision balances to display erratic readings. Therefore, the balance is to be operated on an antistatic surface, in a room with a constant temperature and a steady relative humidity of >65%.

Main specifications

- Electronic balance, weighing capacity 60 g, 120 g or 210 g.
- Tare range = full capacity by subtraction.
- Stabilization time: ≤5seconds.
- Housing resistant to chemicals and cleaning materials.
- Stainless steel weighing pan, approximately 115 mm diameter.
- Adjustable feet (so the balance can be levelled).
- Waterproof display and keypad, sealed by a durable, flexible membrane.
- Background illuminated (backlit) display with digits at least 15 mm high.
- User-friendly menu (preferably in different languages but at least in English) so the balance can be configured to individual requirements.
- Level indicator to be close to the display or in the view field of the display.
- Built-in motorized calibration of weight with automatic adjustment.
- Readability: 0.001 g (1 mg).
- Repeatability: 0.001 g (1 mg).

- Linearity: 0.002 g (2 mg).

Electricity requirements

Supply voltage: 230 ± 10 V, AC, 50/60 Hz. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

Power consumption: Low

- Conform to electrical safety standards IEC 60601–1, UL 61010–1, EN 61010–1.
- Protection class (in accordance with EN 60529).
- Designed not to interfere with circuit radio (in accordance with EN 55014).

Documentation

Manufacturer's certificate

The manufacturer must have a management system certified to ISO 9001.
One certificate to state that the balance has been calibrated at the factory.
Quality and safety standards met by the product must be listed.

Accessories

- Protective dust cover.
- Weighing scoop, 90 mm, stainless steel.

Operation, installation and maintenance

Operation and maintenance manual

At least one set of operation, maintenance and service manuals written in United Nations languages (or at least in English) and preferably also in the official national language of the country requesting the precision balance.

Installation and maintenance

The bidder must arrange for the equipment to be installed by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail. The bidder to also provide user training (including how to use and maintain the equipment) and a comprehensive maintenance plan. The cost of the maintenance plan to be defined and guaranteed over the period of warranty. The supplier to provide an after-sale service that covers the whole country. The service to have competent staff, adequate infrastructure and sufficient spare parts to be able to respond to any complaints and to repair or replace the balance within 14 days.

Standard maintenance tools: All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer. Bidders must specify the quantity of every item included in their offer (including items not specified above).

Spare parts: Each balance to be accompanied by an authorized list of accessories and spare parts.

Warranty: Five years.

Bottle Washer

Main specifications

- Electrically operated motor unit, with a quick release chuck taking a wide variety of interchangeable nylon brushes for cleaning syringes, test tube, McCartney bottles, and round bottles up to 250ml.
- Mounted on a sturdy base to hold the motor assembly and is resistant to acid or chemicals (preferably made of Stainless Steel) with a anti-splash shield made of acrylic/PVC or SS and having a white enameled tray
- Motor to be of 0.5HP or less operated by electric supply of 230V AC /50Hz single phase supplies. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.
- Arrangement to inject water on the brush for cleaning and connect the machine with water source and also a mechanism to drain away waste water/material to existing drainage pipe.
- Dimensions: (approx.) 62.5x27cmsx25cms;
- Accessories: Brushes, nylon, for round bottles capacity 30,120,250ml; brushes, nylon, for McCartney bottles- diameter 25mm.

Biological Safety Cabinet Class 2A with thimble ducting and with UPS

Description of function: The class II BSC is used in a TB laboratory for processing specimens consisting of liquefaction of sputa and handling cultures of tubercle bacilli. This type of BSC is not adequate for handling volatile or toxic chemicals or radionuclides.
Before ordering a BSC, facility and engineering requirements to be checked.
Organization of a periodical recertification of the BSC by an authorized agency to be in place.

Main specifications

- The BSC to meet the requirements of class IIA2 NSF 49 or class II EN 12469; specifically, with regard to inward airflow (≥0.40 m/s according to EN 12469:2000 or ≥0.50 m/s according to NSF 49:2004).

- External height ≤2200 mm including support stand, allowing an available space of at least 400 mm from the top of the BSC to the ceiling. Higher versions may be accepted, provided the 400 mm over the BSC is available to measure air velocity above the exhaust filter, and to have enough space for changing the filter and for ducting and/ or a thimble connection to outlet.

Internal working area (approximate):

- For a BSC of 120 cm (4 ft): width 1150 mm × depth 630 mm × height 650–750 mm.
- A BSC of 120 cm (4 ft) provides the minimal space needed for safe work.
- Inside finish: stainless steel, high quality (e.g. grade 304).
- External housing, including screws, made of stainless steel or equivalent resistant galvanized (zinc-coated) sheet steel, subsequently powder coated and thermally hardened; minimum 80 µm thick, or other material that is hard-wearing, resistant to disinfectants and chemicals used in a TB laboratory, and abrasion resistant.
- Vertically adjustable sliding window: aerosol-tight, sliding, safety glass (laminated multilayer safety glass only), thickness ≥6.7 mm, counterbalanced.
- High optical transmission, but absorption of UV light; minimal reflection.
- Working aperture: ≥170 mm measured from work surface to the bottom of the sash window.
- Maximal lifting height of front window: 500 mm.
- Ability to lock the window hermetically for gaseous disinfection for filter decontamination.
- Single-piece working surface with integrated (V-shaped) front air grill.
- Alternative: Working surface as segments.
- Noise pressure level: ≤60 dbA.

Internal fittings

Two plugs, 230 ± 10 V, AC, 50 Hz, protected with separate T5A (slow blow) fuse.
Voltage and plugs adapted to those used in the country. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

Warning: Plugs inside the BSC may differ from the main connection to the electricity network.
Flicker-free, low-glare, warm-coloured light, >1000 lux.
Control display on the front of the BSC.

- Electrical control or indicators.
- Electronic fan control.
- Flow meter for air inflow velocity.
- Flow indicator or meter for air down flow velocity.
- Operating hours indicator (counter).
- Optional: UV light timer.
- Filter and flow conditions.

Optional: ultraviolet C (UVC) light (253.7 nm wavelength); 30 W with hour counter; with interlock with white light so that the UVC light can be switched on only when the white light source is switched off.
Optional: (if a safety gas burner will be used): Gas tap with solenoid valve, optional right or left side.
For a laboratory located in a seismic area, gas pipes are not recommended; small gas containers (approximately 200–400 ml) with butane gas directly fixed to the burner to be used instead.
Not necessary when a micro-incinerator is used.
Pre filter construction preferred; easily accessible, filter change without tools preferred.

High-efficiency particulate air (HEPA) filter (exhaust air filter); classification at least H14; conforming with EN 1822; metal framed.

Air down flow velocity:

- NSF 49–2002: Requires compliance with the manufacturer's set points, or down flow velocity with a deviation of <0.025 m/s from a nominal set point.
- EN 12469: Airflow velocity should be between 0.25 and 0.50 m/s and is defined by the manufacturer according to the construction. Additionally, no individual measurement should differ by more than 20% of the value requested by the manufacturer within the limits given.

Air circulation volume flow (Modify according to the BSC dimensions):
▪ For a BSC of 120 cm (4 ft): 700–1200 m^3/h.

Influx air velocity:

- According to NSF 49, the average airflow velocity at front aperture should be 0.51 m/s for class A2.
- EN 12469 does not sub classify within class II BSC. The average airflow velocity at front aperture should be at least 0.4 m/s, according to the manufacturer's specifications.

Exhaust volume airflow/fresh airflow inward:
▪ For a BSC of 120 cm (4 ft): 300–600 m^3/h.
Blower system to be able to maintain the airflow within a minimum window (narrow limits) on voltage fluctuations. Data to be available on request.
Alarms, visible and/or audible, for any unsafe condition of the BSC (e.g. airflow, window position, hardware or software errors). Possibility to shut down alarm for cleaning and maintenance.

Electricity requirements

Supply voltage: 230 ± 10 V, AC, 50/60 Hz.
Voltage and plugs to be adapted to meet the country requirements. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

Lead fuse T16A (slow blow) or circuit breaker B16. The electrical regulations valid in the country of use as well as the relevant connection conditions are required.

Power consumption (approximate): Modify according to the BSC dimensions
▪ For a BSC of 120 cm (4 ft): 600 W.
Power consumption for plugs inside: Approximately 1000 W. Note: In areas with frequent breakdown of electricity supply, BSCs with low energy consumption can be an advantage; a UPS with lower capacity can be used.
Conform to electrical safety standards IEC 60601–1, UL 61010–1, EN 61010–1.
Protection class (in accordance with EN 60529).
Designed not to interfere with circuit radio (in accordance with EN 55014).

Documentation

Manufacturer's certificate
The manufacturer must have a management system certified to ISO 9001.
The manufacturer to individually test each BSC before shipment. The test report to be provided to the customer, with a duplicate fixed to the BSC. The tests to be performed with research-grade instruments for valid calibration according to test methods outlined in EN 12469 or NSF 49.
The test report to contain at least data on:

- inflow air velocity
- downflow air velocity
- filter leak scan for both filters to document filters' efficiency and integrity.

Quality and safety standards met by the product to be listed.

Accessories

Table or support frame (support stand) for a working height of 78 ± 2 cm, adjustable at least at three points (feet) to level.
A telescopic support stand is advisable for a flexible use.
Ergonomic laboratory chair, designed for infectious laboratory areas:

- adjustable height to suit different users, seat range approximately 400–490 mm
- adjustable-angle back rest (no arm rest)
- caster wheels (five)
- all metal parts chrome plated
- disinfectable with alcohol-containing disinfectants.

Thimble Ducting: Air duct construction with thimble to exhaust air from the BSC. The air duct to be made for the BSC offered and fit precisely. A thimble connection (see WHO TB Biosafety guidelines 2012 page 33) is used with Class II type A2 BSC that is ducted to the outside. The thimble fits over the cabinet's exhaust housing, sucking the air expelled from the cabinet into ducts that lead outside. A small opening (usually 5 cm

wide) is maintained between the thimble and the cabinet's exhaust housing. This opening enables room air to be drawn into the exhaust ducting system. The thimble must be removable or be designed to allow for operational testing of the cabinet. The power of the external extraction fan installed at the end of the ducting should exceed the volumetric flow rate of each BSC by 30–50%, and should be controllable and connected to an uninterrupted power supply. The air from the BSC should be ducted with ventilation pipes that have a diameter exceed 20 cm. The extractor fan assembly must be easily accessible and preferably kept at the end of ducting with stable fitting. Ducting design should be straight and number of bands should be minimal, bend should be round shaped (sharp/ square bends should not be used). Ducting should have adjustable balancing dampers with easily accessibility so that flow can be controlled as and when required.

All standard accessories, consumables and parts required for the proper installation, operation and maintenance of the BSC to be included in the offer by the supplier and to be specified and quantified.

Operation, maintenance and installation

Operation and maintenance manual
At least one set of operation, maintenance and service manuals, written in United Nations languages (or at least in English) and preferably also in the official national language of the country requesting the BSC.

Installation and maintenance

- The bidder must arrange for the equipment to be installed by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
- The bidder to also provide user training (including how to use and maintain the equipment) and a comprehensive maintenance plan. The cost of the maintenance plan to be defined and guaranteed over the period of warranty.
- The supplier to provide an after-sale service that covers the whole country. The service to have competent staff, adequate infrastructure and sufficient spare parts to be able to respond to any complaints and to repair or replace the BSC within 14 days.
- Initial on-site testing (aerosol leak test, recirculating air filter, exhaust air filter, airflow measurements inside the BSC and inward/exhaust airflow) to be carried out by a certified expert and certified compliant for satisfactory installation and safe operation. Measurement results to be printed out for documentation in the maintenance record.

Warranty starts with certification on site.

Standard maintenance tools
All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning equipment, to be included in the offer. Bidders to specify the quantity of every item included in their offer (including items not specified above). If special tools are needed (e.g. to change filters), they must be provided.

Spare parts

- Each assembled BSC to be accompanied by an authorized list of accessories and spare parts.
- At least one, and preferably two, additional sets of HEPA filters as specified above.

Warning: Special clamps may be needed to fix HEPA filter.

Warranty: Three years, except for filters and (UV) lamp.

Remarks

The equipment offered, including its power supply, to be designed and constructed to operate properly and continuously in the conditions of the purchaser's country; the equipment may need to tolerate high humidity (as high as 90% at 35 °C), ambient temperatures of 5–40 °C, fungi, and spikes in the electricity supply.

Bidders may propose products additional to the requirements listed above.

Uninterrupted power supply with battery pack for BSC

Description of function and use: The UPS must be used in any settings that have frequent problems in the electricity network (e.g. surges, sags, spikes and blackouts) to assure and back up the function of the BSC, so that any current work can be finalized and all potentially infectious sources closed. If the BSC is connected to a generator, the UPS will maintain the function of the BSC during the time needed for the generator to start and to provide full power.

Main specifications

- UPS: microprocessor controlled, online continuous transducer, 20 minutes.
- Booster function to regulate up voltage breakdown to 170 V.
- Buck function to regulate down voltage increase up to 280 V.
- Filter to protect against voltage spikes.
- Protection against overload and short circuit.
- Advanced battery check for automated periodic battery inspection.
- Indicators for status (e.g. normal function, net down, working on battery, loading battery, battery capacity).
- Sleep mode if item consuming power is shut off.
- Power: 230 V ± 25%, 50 Hz or 60 Hz (± 10%) with automatic recognition.
- Battery: maintenance-free, automatic shut-off before reaching the level of discharge from which recharging to the original capacity will no longer be possible.
- Time for recharging: approximately 4 hours to reach at least 90% of total capacity.
- Outlet voltage: 230 V ± 3%, 50 or 60 Hz ± 0.5% (if the country's standard voltage is 110 V AC, adjustment will be needed).
- Efficiency coefficient: approximately 98%, on battery >85%.
- Noise at 1 m distance <48 dBA.
- Permissible ambient temperature and relative humidity: 0–40 °C and 95% (not condensing).

Electricity requirements

Supply voltage: 230 ± 10 V, AC, 50/60 Hz.
Voltage and plugs to be adapted to meet the country requirements. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

Power consumption: Approximately 1500 W (may change depending on requirement for the model chosen as well as the extractor fan connected with thimble connection at the outer end).
Protection class (in accordance with EN 60529).
Designed not to interfere with circuit radio (in accordance with EN 55014).

Documentation

Manufacturer's certificate
The manufacturer must have a management system certified to ISO 9001.

Quality and safety standards met by the product to be listed.

Accessories

- Battery pack.
- Connection (cable and fittings) for battery pack.

Operation, maintenance and installation

Operation and maintenance manual
At least one set of operation, maintenance and service manuals, written in United Nations languages (or at least in English) and preferably also in the official national language of the country requesting the UPS.

Installation and maintenance
- The bidder must arrange for the equipment to be installed by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
- The bidder to provide user training (including how to use and maintain the equipment) and a comprehensive maintenance plan. The cost of the maintenance plan to be defined and guaranteed over the period of warranty.

Standard maintenance tools
All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning material, to be included in the offer. Bidders to specify the quantity of every item included in their offer (including items not specified above).

Spare parts
Each UPS to be accompanied by an authorized list of accessories and spare parts.

Warranty: At least two years for UPS; at least five years for battery pack

Laminar Airflow Cabinet (Horizontal)

Description of function: The Laminar Airflow Cabinet is used in a TB laboratory for Preparation of Media for safety of product.

Main specifications

- The Laminar Airflow Cabinet designed to meet Air Cleanliness Class: **Class 100** (ISO 5) requirements or EN12469 with face velocity: 90 ±20 FPM.
- Working area: Approx.: 4 ft x 2 ft x 2 ft with Single-piece working surface.
- Inside finish: stainless steel, high quality (e.g. grade 304).
- External housing, including screws, made of stainless steel or equivalent resistant galvanized (zinc-coated) sheet steel, subsequently powder coated and thermally hardened; minimum 80 µm thick, or other material that is hard-wearing, resistant to disinfectants and chemicals used in a TB laboratory, and abrasion resistant.
- Blower fitted with suitable capacity Motor and with a provision to vary the speed of Motor & Blower to achieve the required Airflow inside the Laminar Airflow Cabinet.
- Two Stage Filtration:
    - Pre-filter (85 %efficiency for particles >0.5 µm (Washable) with fixed in S.S. frame for first stage air purification, through blower system with easily accessibility.
    - Closed Inner Chamber fitted with HEPA Filter having very accurate performance rate of air filtration, rated 99.99%, resulting in ceasing all air borne molecule of particle upto 0.3 micron in working Area of Laminar Bench.
- Noise pressure level: ≤60 dbA.
- Working area of Laminar Airflow Cabinet illuminated by fluorescent light; with ON/OFF indication on the panel.
- Alarms, visible and/or audible, for any unsafe condition of the Laminar Airflow Cabinet (e.g. airflow, window position, hardware or software errors). Possibility to shut down alarm for cleaning and maintenance.
- Fitted with UV Germicidal lamp for sterilization, with ON/OFF indication on the panel.
- Fitted with UV Resistance Polycarbonate Front Door, sliding type Fitted with Magnehelic Gauge for monitoring the condition of all HEPA filters as well as work space.
- Power Supply: 230 ± 10 V, AC, 50 Hz, protected with separate T5A (slow blow) fuse. Voltage and plugs to be adapted to meet the country requirements. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

Documentation

Manufacturer's certificate

The manufacturer must have a management system certified to ISO 9001.

The manufacturer to individually test each Laminar Airflow Cabinet before shipment. The test report to be provided to the customer, with a duplicate fixed to the Laminar Airflow Cabinet. The test report to contain at least data on:

- Face velocity
- filter leak scan for both filters to document filters' efficiency and integrity.
- Particle count

Quality and safety standards met by the product to be listed.

Operation, maintenance and installation

Operation and maintenance manual

At least one set of operation, maintenance and service manuals, written in United Nations languages (or at least in English) and preferably also in the official national language of the country requesting the Laminar Airflow Cabinet.

Installation and maintenance

The bidder must arrange for the equipment to be installed by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.

The bidder to also provide user training (including how to use and maintain the equipment) and a comprehensive maintenance plan. The cost of the maintenance plan to be defined and guaranteed over the period of warranty.

The supplier to provide an after-sale service that covers the whole country. The service to have competent staff, adequate infrastructure and sufficient spare parts to be able to respond to any complaints and to repair or replace the Laminar Airflow Cabinet within 14 days.

Initial on-site testing (Face velocity, filter leak scan for both filters to document filters' efficiency and integrity, Particle count) to be carried out by a certified expert and certified compliant for satisfactory installation and safe operation. Measurement results to be printed out for documentation in the maintenance record.

Warranty: Three years, except for filters and (UV) lamp.

Warranty starts with certification on site

Warranty period Services to include:

Warranty period starts from successful installation and validation at site.

- Breakdown calls to be attended as and when required
- Preventive Maintenance to be carried out annually
- Annual Validation to be carried out

- Validation should be done for Laminar Airflow Cabinet;
  - At initial installation: on site, prior to initial use
  - Annually in warranty period
  - After replacing filter/blower or any major repair/replacement work
  - After moving the cabinet
- Calibration (Face velocity, filter leak scan for both filters to document filters' efficiency and integrity, Particle count) to be done annually during three year of warranty period for parameters as per manufacturer's instructions/protocol

Standard maintenance tools

All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning equipment, to be included in the offer. Bidders to specify the quantity of every item included in their offer (including items not specified above). If special tools are needed (e.g. to change filters), they must be provided.

Spare parts

- Each assembled Laminar Airflow Cabinet to be accompanied by an authorized list of accessories and spare parts.

Accessories

Table or support frame (support stand) for a working height, adjustable at least at three points (feet) to level.

One set of Pre-filter & HEPA filter.

One set of fluorescent & UV light.

A telescopic support stand is advisable for a flexible use.

Ergonomic laboratory chair, designed for infectious laboratory areas:

- adjustable height to suit different users, seat range approximately 400–490 mm
- adjustable-angle back rest (no arm rest)
- caster wheels (five)
- all metal parts chrome plated
- disinfect able with alcohol-containing disinfectants.

Warning: Special clamps may be needed to fix HEPA filter.

Deep Freezer (-86°C):

Technical Specifications:

Upright Model: CFC free high efficiency double refrigeration system for cooling and freezing filled in the bottom.

Temperature: 0^0C-86^0C + - 0.5^0C (to work in -70 to -86 ^{0}C range)

Temperature Control:

- Digital temperature controller (including display at suitable eye level)
- Microprocessor Control/Microcontroller-for temperature setting
- Alarms for-Voltage, Over heat, Over cool as well as for under temperature, power fail, Door ajar conditions

Size: 300 litres or more (up to 450 L) with minimum 4 Stainless Steel, rust free shelves. Fixed in casters for easy maneuverability. Polystyrene Insulated inner doors for the compartments. Pre-coated metal body to prevent environmental damage

Electricity: 230 volts AC, 50Hz single phase. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

Refrigeration system: Heavy-duty maintenance free refrigeration system with hermetically sealed refrigeration compressors and reliable cascaded refrigeration to minimize noise and vibration. Air-cooled with security lock to prevent unintentional switch off. Short cooling time of 4 to 5 hours at 40°C ambient temperature. The equipment should be of continuous duty and frost- free. Convenient Air Filter Grill allows easy access for cleaning and changing. Access port for CO2 back up.
It shall be fitted with 24x7 temperature recorders / data loggers which allows for a minimum of 3 GB data storage and the data must be downloadable via a USB port. Deep freezer shall not have an automated defrosting system without a manual override.
Audiovisual Electronic Alarm System independent of power supply and Remote alarm contact in case of equipment failure/ power failure
Electrically heated doors for quick opening of frozen doors.
Accessories to include suitable boxes and racks for storage of specimen deposits/ DNA extracts/culture isolates in cryo-vials (16 in No. of suitable dimension for 2 ml cryo-vials). Cyro- gloves (4 sets wrist length 12”) to be provided as part of accessories.

Remarks:
The apparatus should confirm to Indian Standard Institution Guidelines with latest amendments in Indian Standard Specification for Laboratory Deep Freezers or equivalent National or International Standards covering Markings, tests and Safety requirements.
Voltage regulator of appropriate rating to be included to cope with 160-260 V

Deep Freezer (-20 °C):

Description of function and use: The freezer is mainly used to store strains, enzymes and other temperature-sensitive reagents.

Main specifications

- 100% CFC- free.
- One-door freezer, to be used as free-standing freezer.
- Capacity (gross): ≥140 litres (up to 200L).

- Dimensions (W × D × H): approximately 60 cm × 60 cm × 85 cm.
- Net (interior compartment) W × D × H: approximately 47 cm × 43 cm × 69 cm.
- Cooling system, static.
- Defrosting of freezing compartment, initiated manually.
- Temperature range of freezer compartment: –9 °C to – 25 °C which can be set by user for specific temperature
- Housing material and door: steel, coated, white.
- Polyurethane foam “PUF” insulation
- Door hinges right or left as desired, reversible.
- Fungus-resistant door gasket.
- Door with key lock.
- Adjustable feet for levelling.
- Interior container made of white plastic. At least three shelves with wire baskets. Optional -Four shelves in the freezing compartment, at least three closed with a freezing flap.
- External digital temperature display for freezer compartment with high accuracy sensor mounted inside the chamber suspended in air.
- Control panel at the top of cabinet with thermometer Alarms for-Voltage, Over heat, Over cool as well as for under temperature, power fail, Door ajar conditions
- Refrigerant: CFC Free.

Electricity requirements

Supply voltage: 230 ± 10 V, AC, 50/60 Hz. Voltage and plugs to be adapted to meet the country requirements. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

Power consumption: Approximately 150 W.
Conform to Indian Electrical Safety standards or International standards like IEC 60601–1, UL 61010–1, EN 61010–1.
Protection class (in accordance with EN 60529).

Documentation

Manufacturer’s certificate

- The manufacturer must have a management system certified to ISO 9001.
- Declaration of conformity to the requirements of standards and regulations of the directives that apply to the product, including energy classification, gas used as refrigerant, climate class.
- One certificate to state that the freezer has been calibrated at the factory.

Quality and safety standards met by the product must be listed.

Operation, maintenance and installation

Operation and maintenance manual
At least one set of operation, maintenance and service manuals for the freezer, written in United Nations languages (or at least in English) and preferably also in the official national language of the country requesting the freezer.

Installation and maintenance
Any prerequisites for installation to be communicated to the purchaser in advance, in detail.
The supplier to provide an after-sale service that covers the whole country. The service to have competent staff, adequate infrastructure and sufficient spare parts to be able to respond to any complaints and to repair or replace the freezer within 14 days.

Standard maintenance tools
All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning material, to be included in the offer. Bidders to specify the quantity of every item included in their offer (including items not specified above).

Spare parts
Each freezer to be accompanied by an authorized list of accessories and spare parts.

Warranty: Three years.

Remarks
The equipment offered, including its power supply, to be designed and constructed to operate properly and continuously in the conditions of the purchaser's country; the equipment may need to tolerate high humidity (as high as 90% at 35 °C), ambient temperatures of 5–40 °C, fungi, and spikes in the electricity supply.
Bidders may propose products additional to the requirements listed above.

Electric micro-incinerator for loops:

Description of function and use: The micro-incinerator allows sterilization of metal inoculating loops without a flame and is suited for work in a BSC.

Main specifications
- Heating element of ceramic surrounded by isolating cover.
- Quick infrared heating to temperatures ≥800 ºC for fast sterilization.
- Stand with suction-cup feet (or equivalent) for stable, safe operation.
- Possibility to fix the incinerator to a stand at different angles.
- Electricity requirements: Supply voltage: 230 ± 10 V, AC, 50/60 Hz. Voltage and plugs to be adapted to meet the country requirements. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.
- Power consumption: 2000 W.
- Protection class (in accordance with EN 60529).

- Designed not to interfere with circuit radio (in accordance with EN 55014).

Documentation

Manufacturer's certificate

- The manufacturer must have a management system ISO 9001.
- Certificates to be provided for each item supplied.
- Quality and safety standards met by the product must be listed.

Accessories

Attached loop holder.

Operation, installation and maintenance

Operation and maintenance manual: At least one set of operation, maintenance and service manuals, written in United Nations languages (or at least in English) and preferably also in the official national language of the country requesting the micro-incinerator.

Installation and maintenance

The bidder must arrange for the equipment to be installed by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.

The bidder to also provide user training (including how to use and maintain the equipment) and a comprehensive maintenance plan. The cost of the maintenance plan to be defined and guaranteed over the period of warranty.

The supplier to provide an after-sale service that covers the whole country. The service to have competent staff, adequate infrastructure and sufficient spare parts to be able to respond to any complaints and to repair or replace the micro-incinerator within 14 days.

Standard maintenance tools

All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning material, to be included in the offer. Bidders must specify the quantity of every item included in their offer (including items not specified above).

Spare parts

Each micro-incinerator to be accompanied by an authorized list of accessories and spare parts.

Warranty: Three years.

Remarks

The equipment offered, including its power supply, to be designed and constructed to operate properly and continuously in the conditions of the purchaser's country; the equipment may need to tolerate high humidity (as high as 90% at 35 °C), ambient temperatures of 5–40 °C, fungi, and spikes in the electricity supply.

Bidders may propose products additional to the requirements listed above.

Hot Air Oven (32L)

Description of function and use: Hot Air oven of smaller capacity i.e. 32 L is needed for DNA extraction in the processing room

Technical Specifications:
Thermostatically controlled, temperature range ambient to 250°C with fine and coarse adjustment, Memmert type, with fan, digital display.
Approx. overall size 40 cm (L) x 32cm (H) x 25 cm (B), Volume of interior housing: Approx- 32 liters
Housing: preferably stainless steel or at least with a durable, corrosion resistant coating of metal (e.g. galvanized sheet metal coated with epoxy, hardened by heat treatment).
Stainless steel (SS) interiors with supports on three sides, adjustable three perforated shelves.
Fan convection to ensure uniform temperature, fitted with load indicator and safety thermostat take over indicator lamp.
Temperature variation +1 deg C, LCD/LED indicator.
The apparatus should confirm to latest IS6365-1971 in Indian Standard Specification for Laboratory Electric Ovens or equivalent National or International Standards covering Markings, tests and Safety requirements. Voltage Regulator of appropriate rating to be included to cope with 160- 260V. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

Hot Air Oven 260L

Description of function and use: Hot Air Oven of this larger capacity will be used for sterilization of glass ware, etc. in washing and sterilization area of the TB C&DST Lab

Technical Specifications:
Thermostatically controlled, temperature range ambient to 250°C with fine and coarse adjustment, Memmert type, with fan, digital display.
Volume of interior housing: Approx- 250-300 liters
Housing: preferably stainless steel or at least with a durable, corrosion resistant coating of metal (e.g. galvanized sheet metal coated with epoxy, hardened by heat treatment).
Stainless steel (SS) interiors with supports on three sides, adjustable three shelves.
Fan convection to ensure uniform temperature, fitted with load indicator and safety thermostat take over indicator lamp.
Temperature variation +1 deg C, LCD/LED indicator.
The apparatus should confirm to latest IS6365-1971 in Indian Standard Specification for Laboratory Electric Ovens or equivalent National or International Standards covering Markings, tests and Safety requirements. Voltage Regulator of appropriate rating to be included to cope with 160- 260V. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

Hot plate:

Technical Specifications:
Hot plate, heating range 40-110 degree C, 220volt with temperature controller, 1ft x 1ft square flat plate, chemical and scratch resistance ceramic plate, temperature uniform across the plate, spill trough to deflect spills away from electronic and control knobs with a LCD/LED

indicator, hot indicator light whenever hot plate is above 50 degrees. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

Incubator

Description of function and use: The incubator is used to allow growth of Mycobacteria on culture media.

1. Temp: 25 °C Incubator (BOD Incubator) - Capacity approx. 70-100L

Technical Specifications:

- Inner chamber made up of Stainless steel make of SS-304 grade, foamed polyurethane insulation to prevent heat loss, full length inner acrylic security glass door and condensation free chamber
- Housing made of zinc galvanized sheet metal coated with epoxy, hardened by heat treatment, corrosion resistant
- Castor wheel mounted tie easy movability
- CFC free High efficiency refrigeration system mounted at bottom, proper air circulation for uniformity.
- Temperature Range: +5°C to 50°C which is user settable, ±0.5°C resolution
- Temperature Control: Digital Control
- Microprocessor based controller for mains, heating, and cooling with separate indicator lights.
- Accuracy of Temperature: +0.5°C
- The unit shall have resistance temperature detector probe and temperature cut off in case of any temperature change.
- The unit shall comprise of door key lock to protect samples from unauthorized access.
- Power: 230 volts, 50Hz AC, Mains single phase. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.
- Size: (of inner chamber):- 500×400×320 mm approx., Capacity:- Approx. 70-100 liters with 2 or 3 shelves, made of stainless steel and inner illumination with sleek fluorescent tubes.
- Suitable Voltage stabilizer
- Certificate to state that the incubator has been calibrated at the factory.

2. Temp: 37 °C Incubator (Temp. variation ± 0.5°C) (Memmert type)- Capacity approx. 400L

Technical Specifications:

- Inner chamber made up of Stainless steel make of SS-304 grade, full length inner acrylic security glass door
- Housing made of zinc galvanized sheet metal coated with epoxy, hardened by heat treatment, corrosion resistant
- Triple wall with special grade glass wool insulation
- Temperature range, ambient+5°C to 80°C, ±0.1°C resolution
- Controller/Digital indicator for Temperature

- Size in mm approximately (of inner chamber):- 700(W) x 900(H) x650(D), Capacity: 15 cu. ft.(approx. 400 liters) and door swing 65 cms
- Adjustable over-temperature protection controller so as to ensure that the Incubator does not go beyond the set temperature automatically gets cutoff after attaining the set temperature.
- Programs stored on power failure so that when power is restored, equipment continues to function on the previous programme.
- Certificate to state that the incubator has been calibrated at the factory.
- The apparatus should confirm to Indian Standard Institution Guidelines with latest amendments in Indian Standard Specification for Incubators or equivalent National or International Standards covering Markings, tests and Safety requirements. Voltage regulators of appropriate rating to be included for each item to cope with 160-260 V. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

3. Temp: 42 °C Incubator (Temp. variation ± 0.5°C) (Memmert type)- Capacity approx. 70-100L

Technical Specifications:

- Inner chamber made up of Stainless steel make of SS-304 grade, full length inner acrylic security glass door
- Housing made of zinc galvanized sheet metal coated with epoxy, hardened by heat treatment, corrosion resistant
- Triple wall with special grade glass wool insulation
- Temperature range, ambient+5°C to 80°C which is user settable, ±0.1°C resolution
- Controller/Digital indicator for Temperature
- Size in mm approximately (of inner chamber):- 500 (W)×400(H)×320(D) , Capacity:- Approx. 70-100 liters and door swing 65 cms.
- Adjustable over-temperature protection controller so as to ensure that the Incubator does not go beyond the set temperature automatically gets cutoff after attaining the set temperature.
- Programs stored on power failure so that when power is restored, equipment continues to function on the previous programme.
- Certificate to state that the incubator has been calibrated at the factory.
- The apparatus should confirm to Indian Standard Institution Guidelines with latest amendments in Indian Standard Specification for Incubators or equivalent National or International Standards covering Markings, tests and Safety requirements. Voltage regulators of appropriate rating to be included for each item to cope with 160-260 V. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

Inspissator:

Technical Specifications

A shallow polish stainless tray rested inside a tank containing water. The whole undersurface of the tray is in contact with water at a constant temperature which ensures that the temperature of the McCartney bottles with media is also constant. The surface of the tray is a series of sloping steps (at 9 degree angle above the horizontal) and will **hold 162 universal containers**. A blanket is placed over the containers to exclude draughts and a quilted cover provides thermal insulation: both blanket and quilt are made from insect-resistant materials. The temperature of

the water under the tray is controlled by a digital immersion thermostat. Accuracy and reproducibility of set temperature are ensured with the digital display of actual and, at the touch of a button, set temperature. Built in Electronic timer (0–6 hours) which gets activated once set temperature is achieved. The control unit is mounted on a bridge plate over one end of the bath, from which heater, stirrer and temperature sensors project down into the bath. All moving parts are incorporated in the control unit which removable for servicing. The tray and tank are made of polished stainless steel. A constant level device is fitted to maintain the water level despite evaporation losses. Specifications: Std temperature: 85°C; Operating temp. range: ambient +5 to 90 °C.; temperature display: LED; Display resolution: 0.1°C; Uniformity: tray surface + or - 0.7°C;Heater power: (approx.)1.4Kw, 230V+; Tank capacity: (approx.)45 lit; Heat up rate 20 to 85 c; 3.5 hours; working area: length/width: (approx.) 820/594mm; overall dimensions (approx).: 1/w/h: 1040/600/380mm; Over temperature protection: Fixed cut-out; Electrical power: 220-240V 50/60 Hz, 1.5kW(approx.) , The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards. Approx. weight: 25-35 kgs.

Microliter Centrifuge:

Description of function and use: The centrifuge is designed for routine applications in molecular biology.

Main specifications

- Robust metal housing; compact design with chemical-resistant (coated) housing.
- Easy-to-clean, smooth rotor chamber that is resistant to acids, alkalines, disinfectants used in the laboratory.
- Low access height (≤23 cm) and space-saving design (≤24 cm × 32 cm; W × D).
- Microprocessor-controlled centrifuge.
- Standard rotor with a capacity of at least 18 positions; aerosol-tight (chemical-resistant coated); exchangeable.
- Maintenance-free motor.
- Maximal relative centrifuge force: 15,000 G.
- Automatic lid lock, starting with and during run of rotor.
- Option: Automatic opening at the end of the run.
- Emergency unlock for electricity blackout.
- LCD display; protected; showing time and relative centrifugal force or speed in rcf or rpm.
- Speed adjustable in 100 rpm steps.
- If a keypad is used, it should be foil protected.
- Timer for runs between 30 seconds and 30 minutes and an option for continuous operation for longer runs.
- Short time operation by pressing a time button for short spin.
- Adjustment of running time in steps of 30 seconds.
- Short acceleration time to maximum rcf in ≤20 seconds.
- Short breaking time from maximum rcf in ≤20 seconds.
- Noise level: ≤58 dbA.

Electricity requirements

Supply voltage: 230 ± 10 V, AC, 50/60 Hz.
Voltage and plugs to be adapted to meet the country requirements. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

Power consumption: Approximately 250 W.
Conform to electrical safety standards IEC 60601–1, UL 61010–1, EN 61010–1.
Protection class (in accordance with EN 60529).
Designed not to interfere with circuit radio (in accordance with EN 55014).

Documentation

Manufacturer's certificate
The manufacturer must have a management system certified to ISO 9001.
One certificate to state that the centrifuge has been calibrated at the factory.

Quality and safety standards met by the product must be listed.

Accessories

Optional: Adapter set; reduction device for smaller tubes to be centrifuged in the standard rotor to maximal rotor capacity, for 0.5 ml and 0.2 ml tubes.

Operation, maintenance and installation

Operation and maintenance manual
At least one set of operation, maintenance and service manuals written in UN languages (or at least in English) and preferably also in the official national language of the country requesting the microlitre centrifuge.

Installation and maintenance
The bidder must arrange for the equipment to be installed by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail. The bidder to also provide user training (including how to use and maintain the equipment) and a comprehensive maintenance plan. The cost of the maintenance plan to be defined and guaranteed over the period of warranty. The supplier to provide an after-sale service that covers the whole country. The service to have competent staff, adequate infrastructure and sufficient spare parts to be able to respond to any complaints and to repair or replace the microlitre centrifuge within 14 days.

Standard maintenance tools
All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication material, to be included in the offer. Bidders must specify the quantity of every item included in their offer (including items not specified above).

Spare parts

Each centrifuge to be accompanied by an authorized list of accessories and spare parts.

Warranty: 3 years

Remarks

The equipment offered, including its power supply, to be designed and constructed to operate properly and continuously in the conditions of the purchaser's country; the equipment may need to tolerate high humidity, ambient temperatures of 5–40 °C, fungi, and spikes in the electricity supply.

Bidders may propose additional products to the requirements listed above.

Microliter Pipette:

Description of function and use: Microliter pipettes are used for molecular biology procedures; a set of different volumes is required such as of 0.5 to 10µL, 2-20 µL, 20-200 µL and 100-1000 µL

Main specifications

Single-channel microlitre pipettes.

Fully autoclavable (121 °C); UV-resistant material.

Pipette for Range	Increment	Accuracy	Precision
0.5 to 10 µL	0.1 µL	At least ±5.0–1.0%	At least 3.0–0.4%
2 to 20 µL	0.1 µL	±3.0-1.0%	2.5-0.4%
20 to 200 µL	1 µL	±1.8-0.6%	0.7 to 0.2%
100 to 1000 µL	5 µL	±1.0-0.6%	0.7 to 0.2%

In accuracy, first value applies to smallest volume, last one to the largest volume in the stated range

In precision, first value applies to smallest volume, last one to the largest volume in the stated range

Three defined stops (single-button operation preferred):

- take-up from the first stop
- dispensing and blow out
- tip ejection.

Easy and safe tip ejection mechanism.

Fixation of adjusted volume.

Slim pipette shaft.

Cone for standard tips.

Documentation

Manufacturer's certificate
The manufacturer must have a management system certified to ISO 9001.
One certificate to state that the pipette has been calibrated at the factory.

Quality and safety standards met by the product must be listed.

Operation, maintenance and installation

Operation and maintenance manual
At least one set of operation, maintenance and service manuals for each microlitre pipette, written in UN languages (or at least in English) and preferably also in the official national language of the country requesting the microlitre pipette.

Installation and maintenance
The supplier to provide an after-sale service that covers the whole country. The service to have competent staff, adequate infrastructure and sufficient spare parts to be able to respond to any complaints and to repair or replace the microlitre pipette within 14 days.

Standard maintenance tools
All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication material, to be included in the offer. Bidders to specify the quantity of every item included in their offer (including items not specified above).
A maintenance kit, with full documentation and tools for in-laboratory calibration according to ISO 9000, are part of the procurement.

- Spare parts
- Gaskets.
- Lubricants.
- Each microliter pipette to be accompanied by an authorized list of accessories and spare parts.

Warranty: Two years.

Remarks:
The equipment offered to be designed and constructed to operate properly and continuously in the conditions of the purchaser's country; the equipment may need to tolerate high humidity, ambient temperatures of 5–40 °C and fungi.
Bidders may propose additional products to the requirements listed above.

Microscope Binocular -Bright Field

Description of Function: Binocular Microscopes are required for detecting acid fast bacilli in sputum smear and other materials for use in Tuberculosis Control Programme laboratories, including those at Peripheral Health Centers.

Operational Requirements

The usage requires long hours of viewing through the microscopes

General:

i. All optical parts including objectives, eye pieces and prisms should have anti-reflective coating which also gives anti-fungal property.
ii. All metallic parts should be corrosion-proof, acid-proof and stain-proof.
iii. All parts of the microscope (including removable parts) should have insignia of the manufacturer engraved on it.

The supplier will supply the complete assembled microscope in a wooden box along with dust free cover. The box carrying the microscope should be made of well-seasoned wood or teak ply or board. The box should be suitably padded from inside of eliminate the risk of shock during transportation. It should be complete with lock and key arrangement, a suitable locking screw for securing the microscope and a cross-piece to retain it in position during transit. The box should be of an appropriate design with a carrying handle at the top and appropriate internal receptacles for holding the objectives, eyepieces and accessories. It should contain a bag of activated silica gel to keep the interior moisture-free

Technical Specifications

Body: Binocular, sturdy, stable base body with focus adjustment controls in a position comfortable for prolonged use

Eye piece: Paired, high quality, (the image of the object as seen through the binocular eyepiece should be well defined centrally with good contrast rendition and practically free from spurious colour effects, curvature of field over three-fourths of the field of view, and distortion) achromatic, widefield,10x without in built pointer. The eyepiece should be aplanatic and have a minimum field number of 18. Diopter adjustment must be present on one/both eye pieces or on the eye piece tube

Objectives :

- Three objectives: 10x, 40x, 100x,
- 10x and 40x objectives should have numerical apertures of 0.25 and 0.65 respectively and should be of spring loaded type or otherwise.
- 100x should have numerical aperture of 1.25 and should be of oil immersion and spring loaded type. Suitable prominent marking should be provided on 100x for easy identification.
- Unbreakable containers to be provided for storing the objectives. All objectives should be widefield, achromatic and parfocal.
- Marking for the Objectives:

Each objective should be engraved with the following information:-

- Name/insignia of the manufacturer.
- Magnification and numerical aperture, for example, 10x/0.25.
- 100x objective should be engraved with the word ‘Oil’

In changing from lower magnification to next higher magnification or re- introducing the same objective by rotation of the nosepiece the object at the centre of the field shall be well within the field of view

Nose piece:-Revolving nose piece to accommodate a minimum of three objectives with click stops. It should be provided with ribbed grip for easy rotation mounted on a precision ball bearing mechanism for smooth and accurate alignment. Extra ports if any should be fitted with dust proof metallic/ebonite caps

Stage: - Uniformly horizontal, mechanical stage having dimensions of length 140mm (+/- 20mm) & breadth 140mm (+/- 20mm) with fine vernier graduations (minimum reading accuracy of 0.1mm). The stage should be provided with spring loaded slide holder for exact positioning of specimen/slide. It should be designed with convenient sub-stage vertical coaxial adjustment for slide manipulation. The stage should have ball bearing arrangement to allow smooth travel in transverse directions i.e. 80mm (+/-20 mm) and front to back direction, 50mm (+/-20mm)

Sub-stage-condenser:-
Abbe-type condenser, numerical aperture (N.A) 1.25, focusable with rack and pinion arrangement incorporating an aspherical lens and an iris-diaphragm. The condenser should have a filter holder and removable/swing in/out blue filter (suitable for bright field Microscopy)

Sub-stage-illuminator:

- The system should have a built-in variable light source (Illuminator). This light source should have a 20W/30W, 6V/12 V Halogen lamp. The circuitry for the light source should include a constant voltage supply. The system should be provided with a step down transformer and an on/off switch and intensity control. The lamp should be provided with a lamp socket which has the facility for easy replacement of the bulb. The housing of the light source should be such that it will prevent dispersion of light and heating up of the body of the microscope.
- A plano-concave mirror in fork mounting should be supplied which would be attachable to the base of field use. (where power is not available.)
- The fuse for the halogen lamp should be easily accessible to the operator.
- The Illuminator should have a built-in field diaphragm for Kohler illumination

Eye-piece-tubes:-
Binocular eye piece tubes, inclined at 30-45 degrees, rotatable through an angle of 360 degrees, having inter-pupillary distance range of 54-74 mm or wider, covering the above mentioned range

Focusing-knob:
Co-axial coarse and fine focusing knobs capable of smooth fine focusing movement over the full range of coarse travel. The fine focusing movement should have sensitivity of two microns or less (finer) with 200-500 µm per rotation over the entire course of focusing range.

System Configuration Accessories, spares and consumables

Each microscope should be provided with the following:

A. Consumables:

- A bottle of at least 25ml immersion oil, a roll of lens tissue paper and lens cleaning solution (100ml)
- One piece of anti static cleaning brush should be provided with each microscope for cleaning purpose.
- Each microscope should be supplied with Blue filter. The blue filter should be packed in the box and not fixed on the microscopes.

B. Spare parts :Each microscope should be supplied with spare parts as under:
   - 100x oil immersion objective (as per the specifications given under 3.3)- One
   - Halogen bulb, (6 volts, 20w)-6 Nos.
   - Fuses-6 Nos

Environmental factors

Packing and Packaging should be as per procedures in IS : 5204-1969 with latest amendments

Power Supply

Power supply 1). Voltage: 220V, 50 Hz AC 2). Should have one on-off power switch, 3 core power cord with a 3 point male plug. 3) The system should have an inbuilt protective/safety device to withstand fluctuations of voltage from 140V to 280V. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

Standards, Safety and Training

Warranty & Preventive Maintenance: 1.Comprehensive warranty including preventive maintenance of three years from the date of supply. The comprehensive warranty must include replacement of lens also if needed. The bidder must also enter into an agreement with the buyer for providing an annual maintenance contract for a further period of five years. For any malfunction, the supplier shall replace the parts or repair the same at the user site free of cost within 15 days of the receipt of the complaints. During warranty period all services/ replacement ensuring smooth functioning of the Microscopes must be done free of cost by the supplier.

The purchaser at their discretion may conclude CMC for five year on annual payment basis with renewal every year subject to satisfactory performance

Requirement of service centre for after sales services: 1.The supplier should have adequate after sale service facilities covering all region of the country. They should have the infrastructure and trained manpower to respond to any complaints within 48 hours and rectify the complaints within 15 days of receipt of the complaint. 2. Please provide the list of the service centers with contact names and addresses

Testing & calibration:

- The successful vendor should supply a type test-certificate of the relevant optical & mechanical tests from a recognized competent authority at the time of supply
- The manufacturer/supplier shall provide duly calibrated (by accredited authority) measure instruments and demonstrate specifications for the purpose of inspection

- All the testing and calibration procedures specified under the TESTS in IS : 5204-1969 with latest amendments should be carried out and relevant test certificates should be attached for each equipment

The microscope should be either ISI Marked OR CE Marked OR FDA approved product

Documentation

1. User/Technical/Maintenance manuals to be supplied in English.
2. Certificate of calibration and inspection.
3. List of Equipment available for providing calibration and routine Preventive Maintenance Support as per manufacturer service/ maintenance manual.
4. List of important spare parts and accessories with their part number and costing. 5. Log book with instructions for daily, weekly, monthly and quarterly maintenance checklist. 6. Compliance Report to be submitted in a tabulated and point wise manner clearly mentioning the page/para number with authenticated catalogue/manual, without which it will not be considered

Microscopes LED Fluorescence

Main Specifications

Body

Sturdy, stable, base body with focus adjustment devices positioned for a prolonged comfortable use and easy, precise movement. The body shall be epoxy powder coated durable metal, heat treated and resistant to standard reagents used for staining, organic solvents used for cleaning of lenses and disinfectants.

Optical system

All optical parts including objectives, eye pieces, lenses, prisms, should have anti-reflective and anti- fungal coating.

Binocular eyepiece

Binocular eyepiece, preferably with a tube flexible for use in an upper and lower position to ease the use by different lab workers, an ergonomic viewing angle of 30°, a tube rotatable through 360° at interpupillary distance ranging from at least 48–75 mm, maintaining parafocality

Eyepieces

Paired, high-quality, achromatic, wide field, 10 x magnifications. The eyepieces should have a minimum field number of 18, an eyepiece diopter adjustment on at least one eyepiece and no pointer.

Objectives

All objectives should be plan achromat, infinity corrected and usable without cover glass. 20x and 40x objectives should be usable with the fluorescence.

Objectives 2:40x should be of spring-loaded type.

- 10x NA: 0.25 Essential
- 20x NA: 0.40 essential
- 40x dry: essential for confirmation
- 100x NA: 1.25, for oil immersion (essential)
- All objectives should be para focal

Marking and identification

All objectives should be engraved with the following information:

- name or code of the manufacturer
- Magnification and numerical aperture (NA).

Nose piece

Backward/outward tilted revolving nose piece to accommodate at least 4 objectives, any ports not covered by an objective should be closed with dust proof metallic or hard plastic screw caps. The nose piece should be provided with ribbed grip for easy rotation on a precision ball bearing mechanism for smooth and accurate alignment with precise click stops. In changing from one objective to another or reintroducing the same objective by rotation, the object in the centre of the field should not appear displaced by more than 0.04mm in the object plane in any direction

Stage

Rectangular built in, uniformly horizontal, mechanical stage. The stage should be provided with a spring-loaded slide holder for safe and exact positioning of the slide. The construction should allow a smooth travel in transverse directions. Travel range of at least 75 x 30 mm (w x d) with Vernier's scale, fatigue-proof position of knobs for movement, right or left-hand operation.

Condenser

Sub stage condenser of Abbe type, 0.9/1.25, with rack and pinion arrangement incorporating an iris diaphragm.

Substage illuminator

Substage illuminator for brightfield microscopy, with possibility to switch easily between FM and brightfield without tools with: • built in white LED source (3 W, 6 V) with light source life time >30,000 hours. The system should provide a light intensity adjustment device, and an easily accessible on/off switch. The lamp should be provided with a lamp socket for easy replacement of the bulb. The housing for the light source should be designed to prevent dispersion of light and mounted not to heat up the body of the microscope

Fluorescence illumination

Fluorescence illumination, depending on microscope type may be:

- a built-in LED blue light source with maximum wavelength close to 450 nm for reflected light examination or
- an LED blue light source attachment with maximum wavelength close to 450 nm that is fitted into a special objective for reflected light examination

or

- an LED blue light source attachment with maximum wavelength close to 450 nm that is fitted onto the illumination system of a standard microscope and sliding barrier 510 nm long-pass filter for transmitted light examination.

Focusing knobs

Co-axial coarse and fine focusing knobs capable of smooth fine focusing movement over the full range of coarse travel. The fine focusing movement should have a sensitivity of two microns or less (finer) with 200-500 µm per rotation over the entire coarse focusing range. Focusing knobs should be at both sides. A focusing stop safety arrangement/mechanism should be provided to avoid slide breakage, as well as a total range of at least 15 mm. All metallic parts of the microscope to be corrosion proof, acid proof and stain proof.

Electricity requirements

Supply voltage: 220-250, AC, 50 Hz Voltage and plugs shall be adapted to those used inside the country. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

Power consumption:

Will depend on the illumination equipment (max. 30 W) Conform to electrical safety IEC-60601-1, UL 61010-1, EN 61010-1.
Power supply, wide range input with 6 V converter. Protection class (in accordance with EN 60529).
Designed not to interfere with circuit radio (in accordance with EN 55014).

Documentation

Manufacturer's certificate The manufacturer must have a CE certification for quality management system and a type-test certificate of relevant optical and mechanical tests.

Quality and safety standards met by the product must be listed.

Accessories

Dust cover made of antistatic material.

Battery pack Essential:

Rechargeable battery pack (6 V DC)of minimum two hours with charger working with 220– 250 V AC,50 Hz supply, for online and offline power

Eye protection Essential:

If using an FM without a darkroom, a pair of well-fitting soft rubber pieces to protect the eyes and block stray light. One antistatic cleaning brush for each microscope. At least one blue filter per microscope (wrapped separately in a box).
Optional: A self-standing mirror unit adapted to the space between base and sub-stage condenser, providing bright illumination when used in bright field.
Three pin wall adaptor from AC current to be provided for Indian conditions

Operation, installation and maintenance

Operation, maintenance and installation Operation and maintenance manual

At least one set of operation, maintenance and service manuals for each microscope, written in English. The manuals to include instructions for:

- setting up the microscope
- routine cleaning and maintenance (including how to change the bulb)
- changing the batteries inside the pack
- installing and using the mirror (for when the electric lamp is not working)
- planning periodic maintenance.

Installation

The successful bidders must arrange for the equipment to be installed by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.

The bidders to also provide on-site user training on how to use and maintain the microscope.

Inspection

On site (at the site of manufacturer/ authorized agent) 100% inspection would be conducted by a team nominated by the purchaser before accepting the materials.

Warranty

Should provide minimum three years comprehensive warranty.

Maintenance

Comprehensive maintenance including spares parts for five years after completion of warranty period. The purchaser at their discretion may conclude CMC for five year on annual payment basis with renewal every year subject to satisfactory performance.

After Sale Service

The service centre should be in India. The supplier to provide an after-sale service that covers the whole country. The service to have competent staff, adequate infrastructure and sufficient spare parts to be able to respond to any complaints, and to repair or replace the microscope within 3 days (for hard to reach areas 7 days)

PCR Thermocycler:

Description of function: The thermocycler is used in a TB laboratory to amplify fragments of mycobacterial DNA.

Main specifications

Thermocycler, Peltier elements.
Block for 96 × 0.2 ml tubes; possibility to use block with 48 × 0.5 ml tubes and 96-well PCR plates.
Blocks must be resistant to oxidation.
Heating rate: 4 ºC/s.
Cooling rate: 2 ºC/s.

Temperature range (block): 4–100 ºC.
Regulating accuracy for block temperature: ±0.1 ºC.
Temperature uniformity at 70 ºC (block): ±0.4 ºC.
Internal memory for at least 50 programs with up to 99 steps/program, freely editable.
Heatable lid with automatic height adaptation.
Electromechanical lid blocking to prevent accidental opening during a run.
Temperature range for lid: 80 ºC to at least 103 ºC.
Optional: Interface for remote control via PC; activated RS 232 serial port.

Electricity requirements

Supply voltage: 230 ± 10 V, AC, 50/60 Hz.
Voltage and plugs to be adapted to meet the country requirements. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

Power consumption: Approximately 500 W.
Conform to electrical safety standards IEC 60601–1, UL 61010–1, EN 61010–1.
Protection class (in accordance with EN 60529).
Designed not to interfere with circuit radio (in accordance with EN 55014).

Documentation

Manufacturer's certificate
The manufacturer must have a management system certified to ISO 9001.
One certificate to state that the thermocycler has been calibrated at the factory and certified according to ISO 13485 quality regulations.

Quality and safety standards met by the product must be listed.

Operation, maintenance and installation

Operation and maintenance manual
At least one set of operation, maintenance and service manuals written in UN languages (or at least in English) and preferably also in the official national language of the country requesting the thermocycler.

Installation and maintenance
The bidder must arrange for the equipment to be installed by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
The bidder to also provide user training (including how to use and maintain the equipment) and a comprehensive maintenance plan. The cost of the maintenance plan to be defined and guaranteed over the period of warranty.
The supplier to provide an after-sale service that covers the whole country.

The service to have competent staff, adequate infrastructure and sufficient spare parts to be able to respond to any complaints and to repair or replace the thermocycler within 14 days.

Standard maintenance tools
All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer. Bidders to specify the quantity of every item included in their offer (including items not specified above).

Spare parts
Each thermocycler to be accompanied by an authorized list of accessories and spare parts.
Set of fuses, if used separately in the instrument.

Warranty: Three years.

Remarks
The equipment offered, including its power supply, to be designed and constructed to operate properly and continuously in the conditions of the purchaser's country; the equipment may need to tolerate high humidity (as high as 90% at 35 °C), ambient temperatures of 5–40 °C, fungi, and spikes in the electricity supply.
Bidders may propose products additional to the requirements listed above.

PCR Workstation:

Description of function and use: The workstation is used to prepare reagents under clean conditions to avoid contamination with DNA.

Main specifications

Exterior dimensions (H × W × D): approximately 700 mm × 750 mm × 600 mm.
Interior working area (W × D): approximately 700 mm × 500 mm.
Exterior: stainless steel or powder-coated metal.
Interior: stable formed stainless steel.
Side panels transparent, able to absorb wavelengths below 400 nm.
Overhead UV light for DNA decontamination; two lamps, 25 W each.
Separate, switchable, UV air-sterilizing circulation unit; UV lamp (25 W).
Timer and key lock for UV lamp; timer operates only when key lock is on.
Overhead white light; 15 W; at least 800 lux.
At least two plug outlets built into the chamber; AC 230 ± 10 V; 50 Hz; 5A fuse.

Electricity requirements

Supply voltage: 230 ± 10 V, AC, 50/60 Hz.

Voltage and plugs to be adapted to meet the country requirements. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

Power consumption: Depends on the electrical equipment used inside the workstation; maximum 1200 W.
Conform to electrical safety standards IEC 60601–1, UL 61010–1, EN 61010–1.
Protection class (in accordance with EN 60529).
Designed not to interfere with circuit radio (in accordance with EN 55014).

Documentation

Manufacturer's certificate
The manufacturer must have a management system certified to ISO 9001 and a type-test certificate of relevant optical and mechanical tests.

Quality and safety standards met by the product must be listed.

Operation, maintenance and installation

Operation and maintenance manual
At least one set of operation, maintenance and service manuals written in UN languages (or at least in English) and preferably also in the official national language of the country requesting the workstation.

Installation and maintenance
The bidder must arrange for the equipment to be installed by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
The bidder to also provide user training (including how to use and maintain the equipment) and a comprehensive maintenance plan. The cost of the maintenance plan to be defined and guaranteed over the period of warranty.
The supplier to provide an after-sale service that covers the whole country.
The service to have competent staff, adequate infrastructure and sufficient spare parts to be able to respond to any complaints and to repair or replace the workstation within 14 days.

Standard maintenance tools
All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer. Bidders to specify the quantity of every item included in their offer (including items not specified above).

Spare parts
Each workstation to be accompanied by an authorized list of accessories and spare parts.
Set of fuses for the workstation.
Two UV lamps.

Warranty: Three years.

Remarks

The equipment offered, including its power supply, to be designed and constructed to operate properly and continuously in the conditions of the purchaser's country; the equipment may need to tolerate high humidity (as high as 90% at 35 °C), ambient temperatures of 5–40 °C, fungi, and spikes in the electricity supply.
Bidders may propose products additional to the requirements listed above.

pH Meter:

Technical Specifications:

- pH range 0-14 with digital display and stand by and calibration mode;
- Bench top with shielded electrode bulb and waterproof housing.
- Temperature compensation should be provided
- calibration with at least three standard calibration buffers (pH 4.0, 7.0, 10.0)
- Resolution: 0.01 pH units.
- Accuracy: ±0.01 pH units.
- No. of Display Digits: Three
- Supply voltage: 230 ± 10 V, AC, 50/60 Hz, Voltage and plugs to be adapted to meet the country requirements. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.
- The manufacturer must have a management system certified to ISO 9001
- Provision of spare electrode
- A certificate to state that the pH meter has been calibrated at the factory.

Refrigerated Centrifuge with UPS

Description of function and use: The centrifuge will be used in a TB laboratory to spin down mycobacteria in liquefied, decontaminated materials. The compartments containing the centrifuge tubes (buckets) need to be absolutely aerosol tight and closed by transparent lids. At least 3000 G will be required for efficient sedimentation within 20 minutes of centrifugation. The centrifuge should preferably be a desk/bench-top one.

Main specifications

- Metal housing, chamber stainless steel.
- Cooling capacity at maximum speed at +4°C.
- Standby cooling.
- Induction motor, brushless drive.
- Rotor with swing-out buckets, at least four positions.

- Rotor buckets with aerosol-tight, transparent, clipping lids.
- Inserts for buckets adapted to 50 ml centrifuge tubes, conical.
- Capacity: about 16 or more × 50 ml.
- Maximum revolutions per minute: approximately 4500 rpm, corresponding to a radius of approximately 15 cm.
- Relative centrifugal force (rcf): approximately 3400 G.
- Noise level at maximum speed: not more than 60 dbA.
- Programmable for all parameters (switchable between rpm and rcf) of a run; large display.
- Soft start and different acceleration levels (1–9); different braking levels (1–9) and brake force cut-off.
- Input and recall of programs; at least 20 storage positions.
- LCD display (protected against splash of liquids) for indication of run time, speed (rpm) or rcf (after entering centrifugation radius) – switchable, actual temperature, time left to finish run.
- Imbalance switch-off.
- Motor overheating protection.
- Chamber overheating protection.
- Rotor recognition for appropriate over-speed protection.
- Safety lock of lid during run and as long as the rotor is moving.
- Possibility of mechanical opening of lid if there is current blackout.

Electricity requirements

Supply voltage: 230 ± 10 V, AC, 50/60 Hz. Voltage and plugs to be adapted to meet the country requirements. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.
Power consumption: Approximately 1800 W.
Conform to electrical safety standards IEC 60601–1, UL 61010–1, EN 61010–1.
Excess-voltage category II.
Protection class (in accordance with EN 60529).
Designed not to interfere with circuit radio (in accordance with EN 55014).

Documentation

Manufacturer's certificate: The manufacturer must have a management system certified to ISO 9001. One certificate to state that the centrifuge has been calibrated at the factory.
Quality and safety standards met by the product to be listed. Operation, maintenance and installation

Operation, maintenance and installation

Operation and maintenance manual: At least one set of operation, maintenance and service manuals, written in United Nations languages (or at least in English) and preferably also in the official national language of the country requesting the centrifuge.

Installation and maintenance
The bidder must arrange for the equipment to be installed by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
The bidder to also provide user training (including how to use and maintain the equipment) and a comprehensive maintenance plan. The cost of the maintenance plan to be defined and guaranteed over the period of warranty. The supplier to provide an after-sale service that covers the whole country. The service to have competent staff, adequate infrastructure and sufficient spare parts to be able to respond to any complaints and to repair or replace the centrifuge within 14 days.

Standard maintenance tools
All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning equipment, to be included in the offer. Bidders to specify the quantity of every item included in their offer (including items not specified above).

Spare parts
Each centrifuge to be accompanied by an authorized list of accessories and spare parts. Device for mechanical opening of the centrifuge after automatic blocking as consequence of currency blackout.
Lubricants for movable parts and gaskets.
Spare fuses.

Uninterrupted power supply with battery pack for Refrigerated Centrifuge

Description of function and use: The UPS must be used in any settings that have frequent problems in the electricity network (e.g. surges, sags, spikes and blackouts) to assure and back up the function of the Refrigerated Centrifuge, so that any current work can be finalized and all potentially infectious sources closed. If the Refrigerated Centrifuge is connected to a generator, the UPS will maintain the function of the Refrigerated Centrifuge during the time needed for the generator to start and to provide full power.

Main specifications

UPS: microprocessor controlled, online continuous transducer, 20 /30 minutes.
Booster function to regulate up voltage breakdown to 170 V.
Buck function to regulate down voltage increase up to 280 V.
Filter to protect against voltage spikes.
Protection against overload and short circuit.
Advanced battery check for automated periodic battery inspection.
Indicators for status (e.g. normal function, net down, working on battery, loading battery, battery capacity).
Sleep mode if item consuming power is shut off.
Power: 230 V ± 25%, 50 Hz or 60 Hz (± 10%) with automatic recognition.
Battery: maintenance-free, automatic shut-off before reaching the level of discharge from which recharging to the original capacity will no longer be possible.

Time for recharging: approximately 4 hours to reach at least 90% of total capacity.
Outlet voltage: 230 V ± 3%, 50 or 60 Hz ± 0.5% (if the country's standard voltage is 110 V AC, adjustment will be needed).
Efficiency coefficient: approximately 98%, on battery >85%.
Noise at 1 m distance <48 dBA.
Permissible ambient temperature and relative humidity: 0–40 °C and 95% (not condensing).

Electricity requirements

Supply voltage: 230 ± 10 V, AC, 50/60 Hz.
Voltage and plugs to be adapted to meet the country requirements. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.
Power consumption: Approximately 3000 W (depending on the model chosen).
Protection class (in accordance with EN 60529).
Designed not to interfere with circuit radio (in accordance with EN 55014).

Documentation

Manufacturer's certificate
The manufacturer must have a management system certified to ISO 9001.

Quality and safety standards met by the product to be listed.

Accessories

Battery pack.
Connection (cable and fittings) for battery pack.

Operation, maintenance and installation

Operation and maintenance manual
At least one set of operation, maintenance and service manuals, written in United Nations languages (or at least in English) and preferably also in the official national language of the country requesting the UPS.

Installation and maintenance
The bidder must arrange for the equipment to be installed by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
The bidder to provide user training (including how to use and maintain the equipment) and a comprehensive maintenance plan. The cost of the maintenance plan to be defined and guaranteed over the period of warranty.

Standard maintenance tools

All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning material, to be included in the offer. Bidders to specify the quantity of every item included in their offer (including items not specified above).

Spare parts
Each UPS to be accompanied by an authorized list of accessories and spare parts.

Warranty: At least two years for UPS; at least five years for battery pack

Refrigerator (165L or more):

Technical Specifications:

Vertical, capacity 165lts or more (up to 200L), frost free, CFC free, single door.
House hold refrigerator. Equipment quoted should comply with Indian Standards Institutions Guidelines or any other National or International Guidelines. Supply voltage: 230 ± 10 V, AC, 50/60 Hz. Voltage and plugs to be adapted to meet the country requirements. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.Voltage regulator of appropriate rating to be included to cope with 160-260 V.

Refrigerator (300L or more):

Technical Specifications:

Vertical, capacity 300 lts or more (up to 450L), frost free, CFC free, single door.
House hold refrigerator. Equipment quoted should comply with Indian Standards Institutions Guidelines or any other National or International Guidelines. Supply voltage: 230 ± 10 V, AC, 50/60 Hz. Voltage and plugs to be adapted to meet the country requirements. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards. Voltage regulator of appropriate rating to be included to cope with 160-260 V.

Thermometers:

Description of function and use: For TB C&DST Labs, we need five different types of thermometers for various devices as shown below:

1. Electronic Thermo Hygrometer (Two) for at least two rooms (Xpert room and for Media Preparation room+ TB Containment if not available) as these rooms require monitoring of temperature and humidity.
2. Alcohol Thermometer (Eight) for refrigerator, incubator, WII and WIC. A total of 8 will be required assuming there will be 3 refrigerator, 2 incubators, 1 WII and WIC each and 1 spare
3. Digital Maxima- Minima Thermometer – two ranges (one each) for calibration of
    a. -100 to +60 deg C (for -80 deep freezer,-20 deep freezer, refrigerator, WIC)

b. 0 to +300 (for incubator, oven, WII, autoclave, GT Blot, Twincubator, Thermocycler)

4. Dial Spring Thermometer (one) - For Hot Air Oven used in DNA extraction, we need dial spring thermometer

These thermometers are mercury free which helps avoid unnecessary emergency management in case of breakage/spill of mercury.

Electronic max-min thermo-hygrometer

Use: Electronic Thermo Hygrometer is used for at least two rooms (Xpert room and for Media Preparation room+ TB Containment if not available) as these rooms require monitoring of temperature and humidity.

Features:

- Recording of MAX/MIN Humidity & Temperature value automatically
- Alarm function (optional)
- Calendar function with months and years by pushing ADJ button(optional)
- Back stand & hanging hole to be provided with each thermometer

Technical Specification:

- Temperature Range: -10~60ºC (-14F ~122F)
- Humidity Range: 20% ~ 99% RH
- Resolution: Temperature: 0.1 ºC (0.1 ºF), Humidity: 1%RH
- Accuracy: Temperature: ±1 ºC (1.8 ºF), Humidity: ±3%RH (40%~80%)
- LCD size: Approx. 80 x 60 mm
- Memory of MAX/MIN value of temperature & humidity
- Optional :2 modes for time showing: 12 or 24 (changeable by using MODE & ADJ button to set)
- Accessories: Operational Manual, one set of battery
- Power Supply: battery supply
- Warranty Period: 1 year, Warranty starts with installation at site.
- Factory Calibrated Certificate: Equipment must be supplied with valid calibration certificate stating that the equipment has been calibrated at factory.

Glass Alcohol Thermometer:

Use: Glass Alcohol Thermometer is used for monitoring temperature of refrigerator, incubator, WII and WIC.

Technical Specification:

- Range: 0°C to +100°C
- Accuracy: ±1.0°C or better within the range 0°C to +70°C
- Resolution: ±0.5°C
- Sensor: Coloured alcohol in glass column.
- Unit of measurement: Temperatures must be displayed in degrees Centigrade only.
- Casing: Non-corrodible plastics or metal case. The glass column must be protected against breakage and strongly supported so that the column cannot be displaced more than 0.5 mm vertically with respect to the scale.
- Overall dimensions: Maximum 200 x 25 x 25mm.
- Weight: The product must be fully portable.
- Easily readable centigrade scale
    - with a minimum space of 1 mm between each line
    - Long lines with numbers: for each 10 degrees.
    - Short lines: for even numbered degrees.
    - Shorter lines: for odd numbered degrees.
    - Font: high-legibility font.
    - Reading angle: between 80 and 100° to the plane of the support plate.
    - Colour of markings: dark blue or black on a white background

- **Warranty Period:** 1 year, Warranty starts with installation at site

Digital Maxima- Minima Thermometer (-100 to 60 °C)

Use: -100 to +60 deg C Digital Maxima- Minima Thermometer is used for calibration for -80 deep freezer,-20 deep freezer, refrigerator, WIC

Technical Specifications:

- Measuring range: -100 °C to + 60 °C
- Resolution: 0.1°C
- Accuracy: ± 0.1°C
- Precision: ± 0.2 % full scale
- Flexible probe (Preferably K type) Thermocouple, waterproof cable, cold resistance.
- Measuring frequency: 3 measuring per second
- Display: Digital LCD display
- Min-/Max-value memory(optional)
- Operating key: ON/OFF key, Min-max value display, Hold key

- Power supply: 9V battery type
- Low battery warning
- Auto off function
- Calibration certificate: Multi point Calibration Certificate must be submitted with traceability to ISO/IEC 17025 standards
- Warranty Period: 1 year, Warranty starts with installation at site.
- Accessories: Spare one set of battery

Digital Maxima- Minima Thermometer (0 to 300 °C):

Use: 0 to +300 deg C Digital Maxima- Minima Thermometer is used for calibration for incubator, oven, WII, autoclave, GT Blot, Twincubator, Thermocycler

Technical Specifications:

- Measuring range: 0 °C to +300 °C
- Resolution: 0.1°C
- Accuracy: ± 0.1°C
- Precision: ± 0.2 % full scale
- Flexible probe (Preferably K type) Thermocouple, waterproof & Heat resistance cable/probe.
- Measuring frequency: 3 measuring per second
- Display: Digital LCD display
- Min-/Max-value memory optional.
- Operating key: ON/OFF key, Min-max value display, Hold key
- Power supply: 9V battery type
- Low battery warning
- Auto off function
- Calibration certificate: Multi point Calibration Certificate must be submitted with traceability to ISO/IEC 17025 standards
- Warranty Period: 1 year, Warranty starts with installation at site.
- Accessories: One set of battery

Dial Thermometer:

Use: Dial Spring Thermometer is used for monitoring temperature of For Hot Air Oven used in DNA extraction

Technical Specifications:

- Temperature Range: +50 °C to +300 °C

- Accuracy: ±1 % Full Scale. Reading stabilization within 1 min
- Casing Material: Optically clear strong glass cover with Stainless steel surface mount (highly resistance to corrosion)
- Dial: 2 inch.
- Type: Bimetallic dial thermometer
- Weight: Not critical, provided the product is fully portable
- Easily readable centigrade scale with
    - Long lines with numbers: for each 10 degrees.
    - Short lines/dots: for each 5 degrees.
- Font: high-legibility font
- Color Marking: dark black on a white background with Red pointer/dark red on a white background with black pointer
- Factory Calibrated Certificate: Equipment must be supplied with valid calibration certificate stating that the equipment has been calibrated at factory.
- Warranty period: 1year, warranty starts with installation at site.

Tachometer:

Use: for Calibration of Centrifuge

Technical Specifications:

- Display 5 digits large LCD
- Range: 2.5 - 99,999 RPM
- For reading measurement, distance between instrument and reflective tape should be between 50 to 1,000 mm / 2 to 40 inches.
- Accuracy: up to ±0.1 RPM for speed less than 1000 RPM and up to ±1.0RPM for speed greater than 1000 RPM
- Measurement angle for Tachometer holding: to be held at less than 120 degrees.
- Range selection: Auto
- Microprocessor based, high resolution and accuracy
- Laser Output Power: <1mW class II
- Sampling Time: 1.0 second
- Memory: Last value, Max Value, Min. Value
- Battery operated with 4 batteries of 1.5V AA or similar along with low battery indication
- Operating Temperature: 0 to 50 °C
- Operating Humidity: Less than 90%
- Traceable to ISO/IEC: 17025 for full range (complying with NABL requirements)

Standard Weight Box:

Use: for calibration of pipette volume

Technical Specifications:

- Accuracy Class: F1 Class, Cylindrical Knob type weights
- Range: 1milligram to 200 grams to include weights of following denomination in appropriate quantities:
    - In milligrams: 1, 2, 5, 10, 20, 50, 100, 200 and 500
    - In grams:1, 2, 5, 10, 20, 50, 100 and 200
- Material: weights made of High Grade Stainless Steel
- Clear marking of Nominal mass value
- Presentation/Packaging: Individual/ Set of weights packed in polished wooden box lined with velvet cloth or other safety box. To include forceps used for holding weights.
- Each weight to be one-piece construction to provide the maximum mass stability
- All mass weights are made using procedures/standards developed by NIST
- Operating Temperature: 0 to 50 °C
- Operating Humidity: Less than 90%
- Traceable to ISO/IEC :17025 for full range (complying with NABL requirements)

Uninterrupted Power Source (3KVA/1 KVA /5 KVA) with Battery backup

Description of function and use: The UPS must be used in any settings that have frequent problems in the electricity network (e.g. surges, sags, spikes and blackouts) to assure and back up the function of the BSC or other equipment, so that any current work on hand can be finished and all potentially infectious sources closed. If the BSC or the equipment is connected to a generator, the UPS will maintain the function of the BSC or the equipment connected during the time needed for the generator to start and to provide full power. Capacity of UPS required to be suited for the equipment connected and battery back up to provided based on local scenario of electrical outage and power back up availability.

Main specifications:

- UPS: microprocessor controlled, online continuous transducer, 20 minutes.
- Booster function to regulate up voltage breakdown to 170 V.
- Buck function to regulate down voltage increase up to 280 V.
- Filter to protect against voltage spikes.
- Protection against overload and short circuit.
- Advanced battery check for automated periodic battery inspection.
- Indicators for status (e.g. normal function, net down, working on battery, loading battery, battery capacity).

- Sleep mode if item consuming power is shut off.
- Power: 230 V ± 25%, 50 Hz or 60 Hz (± 10%) with automatic recognition.
- Battery: maintenance-free, automatic shut-off before reaching the level of discharge from which recharging to the original capacity will no longer be possible.
- Time for recharging: approximately 4 hours to reach at least 90% of total capacity.
- Outlet voltage: 230 V ± 3%, 50 or 60 Hz ± 0.5% (if the country's standard voltage is 110 V AC, adjustment will be needed).
- Efficiency coefficient: approximately 98%, on battery >85%.
- Noise at 1 m distance <48 dBA.
- Permissible ambient temperature and relative humidity: 0–40 °C and 95% (not condensing).

Electricity requirements

Supply voltage: 230 ± 10 V, AC, 50/60 Hz.
Voltage and plugs to be adapted to meet the country requirements. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

Power consumption: Approximately 1500 W (depending on the model chosen).
Protection class (in accordance with EN 60529).
Designed not to interfere with circuit radio (in accordance with EN 55014).

Documentation

Manufacturer's certificate
The manufacturer must have a management system certified to ISO 9001.

Quality and safety standards met by the product to be listed.

Accessories

- Battery pack.
- Connection (cable and fittings) for battery pack.
- Stand

Operation, maintenance and installation

Operation and maintenance manual
At least one set of operation, maintenance and service manuals, written in United Nations languages (or at least in English) and preferably also in the official national language of the country requesting the UPS.

Installation and maintenance

The bidder must arrange for the equipment to be installed by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
The bidder to provide user training (including how to use and maintain the equipment) and a comprehensive maintenance plan. The cost of the maintenance plan to be defined and guaranteed over the period of warranty.

Standard maintenance tools
All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning material, to be included in the offer. Bidders to specify the quantity of every item included in their offer (including items not specified above).

Spare parts
Each UPS to be accompanied by an authorized list of accessories and spare parts.

Warranty: At least three years for UPS; at least two years for battery pack

Vortex Mixer:

Purpose and use: The mini-shaker is for use in a BSC

Technical Specifications:

- Adjustable speed: 100 to 3,000 rpm, continuous and intermittent “touch-control” modes,
- 220-230 Volts, AC, 50HZ; The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.
- Cup heads size: 25 mm dia. x 22 mm deep for mixing contents in McCartney bottles.
- Heavy cast-metal base and suction cup to assure stability, prevent “walking”.
- Disinfectable
- Remarks: Equipment quoted should comply with Indian Standards Institutions Guidelines or any other National or International Guidelines.

Water Bath:

Technical Specifications:

- Stainless Steel, insulated double walled,
- Inner wall of stainless steel,
- Thermostatic temp. control from ambient to 85 - 90° C (Δ0.50) complete with immersion heater,
- Aluminium /SS cover,
- Brass drain cock,

- 220-240 volts AC, 50Hz. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.
- Dimensions outside:- (approx.)36x41x25 cms; inside:- (approx.)27x30x15 cms; Capacity not given because the dimensions specified are required for the proper functioning of the water bath in the Laboratory for optimum utilization of the space.
- Power: (approx.) 480W;
- Digital microprocessor display to set temperature point preventing thermal runaway,
- Seamless reservoir with no welds to leak or rust, see- through cover is hinged and removable, and steeply gabled to accept taller samples.

Water Distiller:

Technical Specifications:

- Complete unit made in stainless steel.
- Constant level arrangement for inlet water
- Wall hanging model, provided with MS Bracket for wall mounting
- Boiling Chamber, Lid, Cooling Condenser and any other part coming into contact with water / steam should be made of 304 quality stainless steel.
- 'Heating is achieved with kettle type immersion heaters (two)',
- Electricals: should work on 220/440 volts, AC Mains, the line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.
- Capacity of the plant should be **5 litres (approx.) per hour**, should be provided with necessary safety features such as automatic disconnection of heater connections should the still run dry.

Walk in Cold Room

Purpose: To supply, install, commission and test Walk in Cold Room. In places, where Walk in Cold Room is not available/ cannot be constructed, provision should be made for adequate number of refrigerators for storage purposes.

Description:

1. External Dimensions of Walk in Cold Room: 6 feet x 7 feet x 9 feet high (Size of the walk in cold room may vary based on the available space as well as storage requirements)
2. Temperature range: Suitable to maintain temperature of 2 to 4 degree centigrade at all times
3. Panels for walls and ceiling:

- Panel thickness: 60 mm and Internal & External Finish including ceiling made of PCGI (powder coated galvanized iron) of 0.6mm thickness
- Insulation: Prefabricated panels made of CFC free Polyurethane Foam (PUF) , 60 mm thick, with thermal conductivity: 0.16 K – BTU/HR/DEG F/INCH of Panel Thickness, Co-efficient of Heat Transfer: 0.366 W/m C, Density of PUF: 36-40 KG/CU.M

4. Panel Design should have:
   - All the wall and ceiling corners will be connected by pre-fabricated double bends of "U" Sect and three way gasket made of PVC to accept fit of gaps between panels and provide air tight joints without using silicone sealant
   - Corners of the Floors should will be rounded to impeded bacterial growth.
   - Metallic Cam locks for panels designed to withstand 550lbs and uprooting 750lbs maximum.
     - Corner Panels will be 12" wide to form L – Shape and corners cove will be rounded
     - Door:
       - Dimension: 34" wide and 78" high– 01 Number.
       - Type: Flush Type Door
       - Door thickness: 60mm
       - Door sheet :0.6mm PCGI
       - Posi-seal door closer
       - Door Hinge of Positive Cam lift Hardware
       - PVC Wiper Gasket with SS Bracket at Bottom of Door
       - Safety Release Exit device for Opening Door from inside
       - Lock Arrangement from outside with Metallic Cam lock
       - Door Frame/leaf perimeter is of fiberglass reinforced polyester (FRP). FRP resists rust, scratches Dents, impacts and distortion.
     - Floor Design: 60mm panel for flooring with ply-board with anti-skid aluminum checkered plate.
     - Temperature Indicator: Digital Type LED Display at suitable eye length outside with sensor probe hanging in air inside the WIC Room.
     - Interior Lamps: 40W, LED, MOISTURE PROOF – 01 Number.
5. Refrigeration system:
     - Two Sets of Condensing and Evaporating units each of 100% capacity
     - Auto change-over every four hour between both the sets of condensing and evaporating systems.
     - These two units should function such that in case of failure of one unit, the second unit remains operational full time.
     - Refrigeration capacity: 12000/18000 BTU /Hr (1/1.5TR) depending upon the size of cold room
     - No. of refrigeration systems: Two Sets
     - Condensing Unit: Complete Two set (of compressors, coil, circuits and condensing fans)

    - Compressor Type: Hermetic, Make: Any reputed make (such as Copeland, Kirloskar, DANFOSS), Number of Compressors: 02(Two Nos.), Compressor Setting: Through Thermostat
    - No of Circuit: 02 (Two Nos.)
    - No of Condensing Fan: Two
    - Condensing Coil Material: "H" inner Grooved Copper tubes with Slit Aluminum
    - To be located at a place easy to access for repair and with adequate safety to prevent theft/ external damage.
  - Evaporating Unit: Complete two sets including for fan and cooling coil of suitable capacity and other accessories like copper piping, insulation, etc.)
    - location - Ceiling Mounted
    - Piping : Copper Piping and Cabling as required between condensing and evaporating unit
  - Length of Copper Piping between cooling and evaporating units: 15 Feet approx. (depending upon the location of cooling unit from WIC Room)
  - Refrigerant: 100% CFC free
6. Power Supply: 230±10% V, 50-60 Hz
7. Spares and accessories: All required spares and accessories i.e. capacitor, relay contractor, copper tubing, etc. should be supplied to replace immediately by local electrician in case of any breakdown under guidance by vendor.
8. Installation and Commissioning: Including nitrogen leak test for refrigeration gas and pressure test for compressor unit. It should be validated through qualified third party vendor as per NABL requirements with accuracy of ±0.1°C and uniformity of ±1°C.
9. Warranty and Service:
    - Three years for whole of the unit (including 5 years of warranty for the condensation unit)
    - Warranty starts from installation and commissioning on site.
    - Servicing to be done on a regular basis (minimum 6 monthly and unlimited calls in case of breakdown)
    - Calibration once a year through third party with valid traceability

Walk in Incubator Room

Purpose: To supply, install, commission and test Walk in Incubator Room. In places where Walk in Incubator Room is not available/ cannot be constructed, provision should be made for adequate number of incubators for incubation purposes.

Description:

1. External Dimensions of Walk in Incubator Room: 8 feet x 10 feet x 9 feet (Size of the walk in Incubator room may vary based on the available space as well as workload for incubation of solid culture samples). It should be located such that it is connected directly to culture reading room and is nearby to culture processing/ inoculation/manipulation room.
2. Temperature range: Suitable to maintain temperature of 37 degree centigrade at all times.

3. Design of the Walk In Incubator Room:
    - It consists of a room warmer unit to automatically maintain set temperature and which consists of
        - suitable capacity heater
        - a blower motor for uniform distribution of air inside the room
        - a digital controller (to switch on and off the heater) with accuracy of ±0.1°C and uniformity of ±1°C.
        - a flexible temperature sensor (which is suspended in the air) and connected to LED indicator outside informing the temperature,
        - a thermostat which ensures maintenance of desired temperature and also cuts off heater in case of failure of digital controller
        - Necessary wiring
    - The Wall, ceiling and flooring of this room is like in a regular room but it should be uniformly painted, have no seepage, should be without any hole/opening to avoid heat loss and with uniform, even and non-slippery flooring.
    - Furniture inside the room: Suitable metal racks which are adjustable and of adequate height, depth and width for storage of culture bottle trays. Adequate quantity of racks to be arranged for easy storage and removal of trays from the room.
    - Door: Size: 34" x 78" – One, made of suitable thick material to prevent heat loss through it, should be made leak and weather proof (with help of gaskets as required). Door should have self-closure arrangement, with a heavy lock latch made of brass on the outside and provision to push open the door from inside.
    - Interior Lamps: 40W, LED, 01 Number.
4. Arrangements in places where ambient temperature inside the lab goes above 40°C (in area planned for Walk-In-Incubator Room): In such places, the Walk in incubator may not able to maintain the required temperature with warmer unit alone. Thus one refrigeration unit of suitable capacity needs to be installed to maintain the required temperature of 37°C at all times. This refrigeration unit will comprise of a standard condensing and evaporating unit with suitable copper piping between them and operated using 100% CFC free refrigerant.
5. Power Supply: 230±10% V, 50-60 Hz
6. Providing, installation, commissioning and testing of digital temperature controller interconnected between refrigeration unit & warmer unit and automatically maintain the temperature 37 degree. It should be validated through qualified third party vendor as per NABL requirements with accuracy of ±0.1°C and uniformity of ±1°C.
7. Warranty and Service:
    - Three years for whole of the unit (including 5 years of warranty for the condensation unit wherever installed)
    - Warranty starts from installation and commissioning on site.
    - Servicing to be done on a regular basis (minimum 6 monthly and unlimited calls in case of breakdown)
    - Calibration once a year through third party with valid traceability

Alternatively, adequate space may be provided for keeping multiple (3-4) 37 degree incubators as Walk-in incubator rooms are only necessary if the lab is undertaking large number of solid cultures.

Proprietary Items:

1. BD BACTECTM MGITTM 960 System:
   Non-radiometric, fully automated system (annual capacity of 8,300 tubes) for the rapid detection of mycobacteria in clinical specimens, other than blood, as well as antimicrobial susceptibility testing of anti-tuberculosis drugs known as S.I.R.E., I.R., and PZA. Includes Instrument, Starter Kit, AST Starter Kit, Printer and UPS, Installation, Training and Technical support, with comprehensive instrument service including replacement parts for three years

2. BD BACTECTM MGITTM 320 System:
   Non-radiometric, fully automated system (annual capacity of 2,700 tubes) for the rapid detection of mycobacteria in clinical specimens, other than blood, as well as antimicrobial susceptibility testing of anti-tuberculosis drugs known as S.I.R.E., I.R., and PZA. Includes Instrument, Starter Kit, AST Starter Kit, Printer and UPS, Installation, Training and Technical support, with comprehensive instrument service including replacement parts for three years

3. BD MicroMGIT Fluorescence Manual Tube Reader:
   BD's designated catalog number 445923

4. MGIT Accessories:
   a. AST Carrier Set (5-tube)-3 per unit, BD's designated catalog number 445943
   b. AST Carrier Set (4-tube) -3 per unit, BD's designated catalog number 445944
   c. AST Carrier Set (3-tube) -3 per unit, BD's designated catalog number 445945
   d. AST Carrier Set (2-tube) -3 per unit, BD's designated catalog number 445946
   e. AST Carrier Set (8-tube) -3 per unit, BD's designated catalog number 445993

5. GT Blot 48 List Nr. 1003/1 (Hain Life Sciences, GMBH)

   with maintenance service contract including technical support, calibration and replacement parts for three years

6. Twincubator® List Nr. 7025009 (Hain Life Sciences, GMBH)

   with maintenance service contract including technical support, calibration and replacement parts for three years

7. GeneXpert (Xpert® MTB Rif) IV module with desktop (Cepheid)

   with additional warranty for three years (besides two years upfront) covering instrument and parts, onsite visits and remote assistance and Xpert Check kit

General Requirement terms for tender document for procurement of Laboratory equipment:

1. **Pre requisite for equipment installation:** The pre-requisites for installation of equipment should be clearly defined in the technical proposal by bidder and the cost for pre requisite for installation should be borne by bidder. Before proceeding for installation, bidder to confirm that pre requisite for installation are completed on site

2. **Installation of Equipment:** Selected/Awarded bidder has to install the delivered equipment by certified or qualified personnel. Bidder to perform IQ, OQ and PQ for equipment as per Manufacturer Protocols. Bidder to provide user training to end user during installation.

3. **Service/Maintenance:** The supplier shall have a functioning after-sale-service in India covering the whole country, including adequate infrastructure, competent and adequately staffed technical personnel with adequately provisioned spare part store allowing responding to any complaints and to repair within 7 days /replace the unit within 14 days of receipt of complaint.

4. **Warranty: 3 years (preferably 5 years for bigger instruments)**
   Warranty period for equipment will start and applicable as mentioned below;

   Warranty period Services to include

   a. **For BSC**: Warranty period starts from successful installation and validation at site.
      - Breakdown calls to be attended as and when required
      - Preventive Maintenance to be carried out annually
      - Annual Validation to be carried out
      - Validation should be done for BSC;
        - At initial installation: on site, prior to initial use
        - Annually in warranty period
        - After replacing filter/blower or any major repair/replacement work
        - After moving the cabinet
      - Calibration to be done annually during three year of warranty period for parameters as per manufacturer's instructions/protocol

   b. **For Refrigerated Centrifuge/Microliter Centrifuge:** Warranty period starts from installation and successful calibration of equipment at site.
      - Breakdown calls to be attended as and when required

- Preventive Maintenance to be carried out on six monthly basis.
- Calibration to be to be carried out on six monthly basis and in case of any major repair/replacement of spare part.

c. **For Pipette:** Warranty period starts from installation and successful calibration/validation of equipment at site.
   - Breakdown calls to be attended as and when required
   - Preventive Maintenance to be carried out on six monthly basis.
   - Calibration to be to be carried out on six monthly basis and in case of any major repair/replacement of spare part.

d. **For Incubator/ Oven/ Autoclaves/ Weighing Balance/ Refrigerator/ Deep Freezer/ Thermocycler/ Water Distiller/ Water bath/ Electric Micro Incinerator/ Inspissator/ Walk In Cold Room/ Walk In Incubator:** Warranty period starts from installation and successful calibration/validation of equipment at site.
   - Breakdown calls to be attended as and when required
   - Preventive Maintenance to be carried out annually.
   - Calibration to be done annually during three year of warranty period for parameters as per manufacturer's instructions/protocol and in case of any major repair/replacement of spare part.

e. **For Heating plate/ pH meter/Vortex Mixer/UPS/ Microscope-Bright Field or LED Fluorescent/PCR Workstation:** Warranty period starts from successful installation at site
   - Breakdown calls to be attended as and when required
   - Preventive Maintenance to be carried out annually.

5. **Equipment Manual:** Installation**,** Operator, Maintenance/Service manuals in English should be provided with each equipment.

6. **Spare part list**: Bidder to submit the spare part list including the cost for quoted equipment

7. **Accessories list**: Bidder to submit the accessories list including the cost for quoted equipment

8. **Factory Calibrated Certificate**: Equipment must be supplied with valid calibration certificate stating that the equipment has been calibrated at factory.

9. **<u>Packing data</u>**
   Packing data are not necessarily part of the bidding process, but are needed for shipment and for customs declarations.

   Net weight.
   Gross weight.
   Dimensions (W × H × D) in cm.
   Appliances must be transported upright (Y/N).
   Customer's tariff number.

10. The design and workmanship of equipment offered, including power supply, has to be suited to operate properly and continuously under the climatic conditions in India, especially humidity (e.g. <90% at 35°C), permissible ambient temperature (e.g. +5°C to +45° C), protection against fungi, and possible spikes in the electric network.

11. ISO 9001: The manufacturer must have Manufacturer System Certified to ISO 9001.

12. Safety standards**:** The equipment must comply with ISI certification as per BIS Standards or any equivalent international safety standards such as IEC- 61010 and IEC-60601 etc.