GOVERNMENT DOON MEDICAL COLLEGE, DEHRADUN
DEPARTMENT OF MICROBIOLOGY

TECHNICAL SPECIFICATIONS

1. AUTOMATED NUCLEIC ACID EXTRACTION SYSTEM

1. The basic instrument shall be a closed, cartridge system and comprise of a software controlled single unit for genomic nucleic acid extraction (both DNA and / or RNA) with minimal or no human intervention in-between the extraction steps.
2. The automated extraction system shall have the capacity of carrying on-board basic steps including lysis of cellular material, concentration of nucleic acid, washing / flushing of impurities and elution of purified genomic nucleic acid without involving any kind of manipulation in between.
3. The system shall shave capacity to carry out polymerase chain reaction on real time basis supported by either probe or dye chemistries or both.
4. The system must be free off any batch processing restrictions and must be able to accommodate randomized specimen.
5. The system shall allow continuous specimen and reagent loading ant any point of time.
6. The system should have flexibility of both on-board lysis and off-board lysis of specimen.
7. The system should have property of absorption or adsorption of extracted nucleic acid on magnetic beads preferably glass or silica.
8. The system should have options for processing of multiple sample types (blood, urine etc) in a single run.
9. The system should be compatible with all kinds of human biological specimen (Fluid) including blood, bronchial lavage, cerebrospinal fluid, synovial fluid, aspirated fluid etc.
10. The system should be compatible chemicals such as sodium hydroxide, citrate, N-acetyl- L-cysteine etc. that may be incorporated with pre-processed specimen.
11. The system should have a flexible sample run size accommodating 24 / 48 or 96 or more specimens in single run.
12. The system should have flexibility to accommodate different sample volume, for different types of specimen, ranging from 10 microlitre till 1000 microlitre, along with different elution volumes ranging from 10 microlitre till 100 microlitres **all in the same run**.
13. The system should have in-built space for the storage of reagents on-board.
14. The system should have sensors to detect the levels of reagents and generated liquid waste during the run and shall be able to store waste discard of atleast 500 reactions or more.

TECHNICAL SPECIFICATIONS

1. AUTOMATED NUCLEIC ACID EXTRACTION SYSTEM

15. The system should have capacity to automatically calculate amount of reagents required during run once the number of specimen and elution volumes command is given to the software.
16. The system should have biosafety features such as lockable bio-containment sash that cannot be opened during workflow.
17. The System should be IVD, US FDA approved platform to purify DNA, RNA, and viral nucleic acids from a wide range of starting materials using magnetic glass particle technology.
18. The system should have a sample turn-over of not more than 240 minutes for a maximum of 96 specimen in a single run including nucleic acid extraction, real time polymerase chain reaction amplification and generation of valid results.
19. The system should have prefilled, ready-to-use reagents under working temperature range of 10 to 100 degree. The reagents should be stable enough at broad temperature range.
20. The system itself should have a working temperature range of 10 to 100 degree.
21. The system should have in-built washing, rinsing and calibration capacity.
22. The equipment should have touch screen display and software that allows programming at different user level, data storage, privacy and bar coding.
23. The system should have capacity of exporting data through USB interface.
24. The system should be compatible with 21 CFR part 11.
25. The system shall be equipped with bi-directional LIS interface.
26. The system shall be upgradable to different RT-PCR protocols as per user need.
27. The complete unit should be CE-IVD certified.
28. The complete system shall be supplied with five years comprehensive warranty including hardware, software and consumables

Certified that the specifications are broad based, general in respect to the requirement and not suit to any particular firm/brand

---

TECHNICAL SPECIFICATIONS

2. RAPID DETECTION SYSTEM FOR COVID-19 / TUBERCULOSIS

1. The system should be a fully integrated, automated real-time PCR instrument which should include the extraction of nucleic acids (both DNA & RNA), amplification and detection in a single step / cartridge.
2. The system should be a self-contained, single-use cartridge platform with complete, independent, temperature controlled fluorimeter for performing and continuously monitoring chemical reactions such as real-time PCR.
3. The system should work on the self-contained test cartridge carrying all the necessary components to carry out the PCR test. The cartridges should be single-use disposable units.
4. The system should be able to control specimen temperature rapidly and precisely, thus allowing faster reaction with accurate results
5. The system should be controlled through stand-alone laptop.
6. The system should have capacity to test 16 specimen in an integrated modules which are independently used and controlled for any test cartridge.
7. Each module must include a six channel or more optics system capable of exciting and detecting multiple fluorescent dyes in the same reaction tube with dye detection limit of atleast <1nM.
8. Each Active Module should have Solid State heater and forced air cooling.
9. The module shall have a ramp rate-heating: 10°C/sec from 50°C to 95°C. Cooling: 2.5°C/sec from 95°C to 50°C
10. The system should have continuous optical monitoring during amplification to allow the software to automatically stop the reaction as soon as the target is detected, shortening the time to results.
11. The system should be capable of sample analysis to be performed using much less power than traditional methods by performing all the complex steps of DNA or RNA extraction in its advanced “micro fluidic” cartridges.
12. Each unit of the system shall be operatable and controlled independently, in contrast to traditional thermal cycling systems, in which all samples are subjected to the same time/temperature/ optical protocol, each sample in the system can be subjected to a different protocol.
13. The system software shall have capacity / ability to contain the unique feature, decision command that shall enable automated reflex or confirmation testing with a second reaction based on the results of the first reaction — **all in the same cartridge with no human intervention.**
14. The system shall able provide initial screening and subsequent confirmation results of the target etiology as per requirement in a single set of reaction.
15. Each module shall be able to detect four to six targets in a single reaction cycle with up to twelve results per assay.
16. The system shall have the capacity to be upgraded with additional modules.

2. RAPID DETECTION SYSTEM FOR COVID-19 / TUBERCULOSIS

17. The system shall support virtually any kind of airborne, liquid or solid sample, including human specimens such as whole blood, urine, vaginal, anal, and nasal swabs, bone marrow, sputum, serum, plasma and cerebral-spinal fluid with advanced ultrasonic techniques enable rapid lysing of all cell types.
18. The system shall be space-saving and low-power requirement so that it can be easily installed and operated in virtually any indoor setting.
19. The entire system should have the endorsement of apex authorities either WHO / CDC.
20. The system should be CE-IVD and US-FDA for diagnostic use.
21. The system should include built-in (quality) control for all test steps.
22. The system should be able to perform on-demand test run and should have random access.
23. The system should be easily connected to LIS/HIS if required
24. The system should require no special (lab or PCR) environment to operate effectively.
25. The system should require minimal expertise to operate and run and to report the results.
26. The system should have different tests available to use- HIV-1 Viral Load / HBV Viral Load / HCV Viral Load / MTB/MTB DR testing / BCR-ABL / HPV / SARS-COV -2 etc.
27. The complete system including accessories shall be supplied under five years comprehensive warranty.

TECHNICAL SPECIFICATIONS

3. TYPE 2 B 2 Biosafety Cabinet

1. The basic equipment shall BE A TYPE 2 B 2 CLASS BIOSAFETY CABINET
2. comprise of exhaust HEPA/ULPA filter for supply air, negative pressure plenum exhaust, front opening sash with 8 to 10 inches opening, suitable blower assembly, necessary lighting indicators and controls for the cabinet. The equipment should be mounted on stand with wheels / leveling feet. The exhaust plenum should be under negative pressure, hard ducted to outside. The dedicated exhaust ducting system should be connected via a canopy connection to outside.
3. Cabinet should be microprocessor controlled Type II B2 and 100 percent exhaust.
4. Main body, side and front panel should be made of electro-galvanized steel or mild steel along with rust free stainless steel working space, oven backed epoxy powder coated finish.
5. The cabinet must conform to the regulations and standards including European Community – Electrical Safety Standard: IEC 1010-1 and Electromagnetic Compatibility Directive: 89/336/EEC (230V, 50Hz models only).
6. Sound Emission 60-65 dBA .
7. Internal width should be approximately 5ft-6ft.
8. Interior work area of a single piece of class 304 stainless steel
9. Switches and indicators: Individual switches and indicator lamps for blower motor, fluorescent lamp and UV lamp.
10. The motor should be able to automatically adjust the airflow speed without the use of a damper.
11. The cabinet must incorporate two brushless DC Motors.
12. Pre-filter, down flow and exhaust filter- HEPA / ULPA with rated efficiency of 99.995% (or better) at 0.3 microns to provide product protection of Class 100.
13. The exhaust blower should be able to continue to operate in case supply blower stops working. The supply filter should turn off in case of failure of exhaust failure.
14. ***The exhaust should include a leak-tight duct, a leak proof damper in the duct above the cabinet to allow closure for gaseous decontamination, a separate damper to allow air flow control and adjustment, and an external exhaust fan as the final system component***
15. Programmable UV light to allow specific exposure time range from 0 to 24 hours.

TECHNICAL SPECIFICATIONS

3. TYPE 2 B 2 Biosafety Cabinet

16. The opening sash to be made of at least ¼" tempered safety glass with no sharp edges.
17. The front of the cabinet to be 8 to 10 degree angled to avoid glare on the window.
18. Frameless, shatterproof sash with programmable UV lights which shuts-off on sash opening
19. Inflow Air flow velocity should be 100-110 fpm, 100% exhaust, efficiency should be >99.995% at 0.1 micron to 0.3 micron.
20. Real time display of inflow and downflow velocities on microprocessor controlled LED.
21. 2 choke-less fluorescent lamps (with light intensity of at-least 1000 lux or more over entire working area), 2-3 service valves for gas inlet, 2 electrical duplex outlet (NON GFI) each of 5 ampere on both sides of cabinet interior wall.
22. The Bio safety cabinet should have dual side wall with negatively pressurized interstitial space.
23. Germicidal UV lamp >40 microwatt/sq.cm 250-255 nm over the entire work surface.
24. Electrical protection: the equipment should be fitted with earth leakage circuit breaker ELCB)
25. The cabinet should be supplied with 5 KV servo stabilizer.
26. Ergonomic Lab Chair should have laboratory grade construction.
27. Must be provided with calibration and validation certificate.

The Biosafety Cabinet should be tested on site and comply with the following requirements

- Down flow velocity and Volume Test.
- Inflow Velocity Test.
- Airflow Smoke Pattern Test.
- HEPA Filter Leakage Test.
- Cabinet Leakage Test.
- Electrical Leakage: Ground Circuit Resistance and Polarity Test
- Lighting Intensity Test.
- Vibration Test.
- Noise Level Test.
- UV Lamp Intensity Test.
- Alarms and indicators test (if provided).

TECHNICAL SPECIFICATIONS

3. TYPE 2 B 2 Biosafety Cabinet

- The differential pressure gauge should be calibrated.

All the tests have to be conducted by an Accredited Agency which shall then issue "Test Certificate" and send it to the respective consignees. Subsequently, the tests shall be conducted (after installation at the respective consignee's Laboratory site) by the supplier and 'Certificate of Satisfactory Installation' shall be obtained from the respective consignees

28. Five years comprehensive warranty ***supported with yearly calibration and certification.***

29. SFDA Certified to YY069, 4ft/1.2m, EN 12469 Compliant
30. IEC 1010-1 and Electromagnetic directive 89/336/EEC certification.
31. NSF / ANSI 49, ETL, CE Certification
32. ***The manufacturing firm should be ISO certified***.
33. Spare accessories – HEPA filters (one)-dimensions same as above, Pre-filters (two). The price to be quoted inclusive of spares given in specifications.

Certified that the specifications are broad based, general in respect to the requirement and not suit to any particular firm/brand.

TECHNICAL SPECIFICATIONS

4. DEEP FREEZER

1. The basic unit shall be an upright ultra low temperature deep freezer.
2. It should provide an operating temperature of -10°C to –45°C with 1°C increment.
3. The freezer must attain -40 degree temperature while operating at ambient temperature of 32 to 45 degrees
4. Freezer must have capacity of 740 litres and above to hold more than 60000 cryovials of 1.7 ml capacity or above.
5. The equipment shall have fully programmable microprocessor controlled with membrane keypad and eye level control panel.
6. System should have 304 L grade stainless steel interior and tough, powder coated exterior finish.
7. Freezer should have insulated doors and adjustable shelves with 4 to 5 inner storage compartments.
8. Freezers should have heated air vent and front panel air filter.
9. The unit shall have heavy duty lockable castors and lockable outer doors and lids.
10. Freezer must have battery back-up and 4 PIN security lock for unauthorized tempering.
11. Freezer must have on board SMART diagnostic software.
12. The unit shall comprise of audible and visible alarms for temperature, power failure, system failure, battery low etc.
13. Freezer must use CFC-FREE, HCFC-FREE nonflammable refrigerants, with polyurethane insulation and refrigeration system must be energy efficient and hermetically sealed refrigeration system.
14. Freezer must be energy efficient with power consumption max. of 12-15 KWh/day.
15. Compressor should be capable to run voltage 220-240 V, and should be provided with five years warranty.
16. Freezer must have ISO 9001- safety requirements and IEC 61010 Electrical safety European CE and UL certified.
17. Freezer must have washable condenser filter indication which should keep fins free of dust to maintain peak cooling efficiency.
18. The complete unit shall be provided with five years comprehensive warranty.

TECHNICAL SPECIFICATIONS

5. ULTRA DEEP FREEZER

1. Ultra deep freezer should be Vertical model.
2. The width of the freezer (external dimension) should be 30-35 inches.
3. The freezer should have twin / single external door and at-least four inner doors.
4. The freezer should have four or more internal storage compartments with polystyrene insulated doors.
5. The freezer should have at least 1 inch thick vaccum panel insulation in conjunction with thin nano-gel or water blown foam technology.
6. The freezer should have tripple sealing silicon gasket and thick external double door to minimize heat transfer.
7. Inner doors should not have latches or external magnets**.**
8. The machine should be microprocessor controlled with features of padlock compatibility, ergonomic door handling and integrated key lock system.
9. The freezer must have a minimum capacity of 500 to 600 litres.
10. It should be capable of storing minimum 40,000 vials of 2 inch size.
11. Temperature set range should be from -70 degree C to -90 degree C.
12. The complete system should be able to work in an ambient temperature of up to 45 degree .
13. The doors should be equipped with front mounted display / controls at eye level.
14. Both visual and audible alarms must alert operator of over and under temperature, power fail, Door ajar conditions.
15. The freezer should have twin compressor (each 1 HP) with battery backup of 72 hours.
16. The freezer should have Pre-coated metal body to prevent environmental damage
17. The freezer should have a power supply of 230 V, 50 Hz, 12 FLA
18. It should have a built in voltage compensator of at least 18 V to compensate high and low voltages

TECHNICAL SPECIFICATIONS

5. ULTRA DEEP FREEZER

19. Temperature probe must be positioned to insure the alarm sounds before the stored product can be affected by a rise in temperature
20. Freezer shall have an on-board data / event logger that allows for a minimum of 3 GB data storage. The data must be downloadable via a USB port.
21. The instrument should be provided with a 5 KV servo stabilizer
22. 5 years comprehensive warranty.
23. ISI/ISO/CE equivalent certificate will be preferred
24. UL, CUL and CE Certification

Accessories:

1. Stainless steel racks with boxes.
2. Cryo gloves wrist length approximately 12".

Certified that the specifications are broad based, general in respect to the requirement and not suit to any particular firm/brand.

TECHNICAL SPECIFICATIONS

6. HEAVY DUTY CENTRIFUGE

1. The system shall provide a maximum speed of 15,200 rpm or 20000g
2. The centrifuge must be capable of generating RCF in excess to 7,164 x g in a swinging bucket rotor and in access to 25,314 x g with a fixed angle rotor.
3. Floor Model centrifuge with Capacity not be less than 3 liters.
4. The centrifuge must be capable of running up to 196x5ml or 7 ml blood collection tubes and 144x10ml blood collection tubes in certified sealed condition
5. The centrifuge must be capable of running up to 6 x250 ml disposable tubes with max RCF of 18,500xg.
6. The centrifuge must be capable of spinning tubes and bottles varying from 1.5ml to 750ml.
7. The centrifuge must have capacity to spin minimum 28 standard micro plates with minimum RCF of 1840 x g or more in one run.
8. The centrifuge must have minimum of 5 direct recall program keys and capability of up to 99 programs
9. System must be able to display set parameter along with actual value
10. System should also have min. 9 acceleration and 10 de-acceleration profiles.
11. The centrifuge must have an option for automatic lid opening at the end of the run
12. The centrifuge must have capability of password protection for the programs and lid opening
13. The centrifuge must be able to display both air/sample temperature as well as temperature in the sample, ensuring biological activity is maintained
14. The centrifuge must have dual time mode: time at start and time at speed to ensure reproducible result
15. The rotor shall be installed and removed with no tools in less than 5 seconds
16. System must have microprocessor control soft touch key pad control & a brushless induction drive.
17. Temperature set range should be from –10 to +40^{o}C
18. Rotors: Click seal biocontaminant lid
19. Swing out rotor with round bucket to accommodate min. 40 tubes of 50 ml capacity with min. RPM of 3500. MUST be supplied along with Adaptor for 15 ml tubes.
20. Swing out rotor 4X750ml with max rpm 4700 & max 4800g and adapters for 500 ml,250ml, 15ml and 50 ml round bottom & conical tubes.
21. Microliter fixed angle sealed aluminum rotor 30 position 2.0 ml with max speed 15000 rpm and 25000 g.

TECHNICAL SPECIFICATIONS

6. HEAVY DUTY CENTRIFUGE

22. Fixed angle light weight carbon fiber rotor 6X250ml with max rpm 11000, 18500 g and adaptors for 50 ml round bottom & conical tubes.
23. Fixed angle rotor for 196x5ml or 7 ml blood collection tubes and 144x10 ml blood collection tubes in certified sealed condition.
24. Fixed angle light weight carbon fiber rotor 6X100ml with max rpm 15000, 24000 g and adapters for 2ml, 15ml round bottom & conical; 50 ml round bottom & conical
25. 5 Year Comprehensive Warranty.
26. Must be supplied with 5 Kva servo stabilizer.
27. ISI/ISO/CE equivalent certificate will be preferred
28. CE(EU)/US-FDA/BIS Certification,
29. UL listed, CSA certified, IVD compliant, Certified Biosafety

Certified that the specifications are broad based, general in respect to the requirement and not suit to any particular firm/brand.

TECHNICAL SPECIFICATIONS

7. GERMICICDAL ULTRAVIOLET RADIATION (GUV) SYSTEM

1. The basic unit shall achieve germicidal effect to upper room area thorough a designed fixture that should direct UV radiation to upper room.
2. The basic unit shall be a wall mountable, durable, non-corrosive, made of stainless steel base & powder coat aluminum Baffles.
3. The unit shall have dimensions: 5.o to 6.0 inch (H) x 23 to 26 inch (W) x 7 to 8 inch (D).
4. The UV lamp should have output of atleast 8.5W and strong emission line at atleast 254 nanometers.
5. The UV lamp should be wall mounted with irradiation angle of 160 to 170° that shall be able to increases the average dosage within the space.
6. The baffle systems shall be provided in order to guard against exposing room occupants to potentially harmful UV rays.
7. The system shall ensure irradiance less than or equal to 0.2 microwatts per square centimeter at 254 nanometer.
8. The system shall be able to provide UV in range of 10 to 200 microwatts per square centimeter.
9. The reflectors should be constructed in 95% mirror material in order to increase the amount of UV that passes through the baffles.
10. The reflectors shall be parabolic reflectors in two layers.
11. The main parabolic reflector should be able to reflect light from the sides of the bulb forward.
12. The rear parabolic reflector shall be able to reflect light from the back of the bulb forward.
13. The weight of the complete unit should be less than 20lbs and shall be easily mounted on the wall.
14. The unit must be installable at a minimum of 7 feet from the floor.
15. The unit shall be supplied with 5 Year Comprehensive Warranty from the date of installation.
16. ISI/ISO/CE equivalent certificate will be preferred
17. CE(EU)/US-FDA/BIS/CDC Certification, Certified Biosafety.

Certified that the specifications are broad based, general in respect to the requirement and not suit to any particular firm/brand.

TECHNICAL SPECIFICATIONS

8. POSITIVE AIR PRESSURE RESPIRATOR (PAPR)

1. The system should cover the requirement of powered air purifying respirator for providing respiratory protection against harmful particulate dust matter, vapours etc.
2. The unit consists of a Head top, Breathing tube, Blower unit, 7-8 hour battery, Dip charge unit, Organic Vapors & Particulate Filter Airflow Indicator and filter shower cap.
3. All the components of the unit shall be approved in conjunction for use. i.e. blower unit, filters, battery, Breathing tube and head top.
4. The unit must be a waist mounted, battery operated blower unit which provides a continuous supply of filtered air to a headpiece as a part of a respiratory system.
5. The unit must be of a smooth shape to allow for easy cleaning.
6. The unit filter shall have an additional cover to protect from Dust Ingress and have an Ingress of Protection code of IP53.
7. The unit must be a Low profile modular Powered-Air unit for use with various different head tops.
8. The unit when used in conjunction with one of the approved head tops should form a powered assisted filtering device or the Powered Air Purifying respirator (PAPR).
9. The waist mounted unit shall be mounted on a padded comfort belt so it fits neatly into the small of the back and positions itself ergonomically which in turn will reduce tiring to wear particularly towards end of shifts.
10. The PAPR should incorporate an electronic control unit (ECU) that ensures that the blower unit supplies a constant flow of air at or above the manufacturers minimum design flow (MMDF) to the user i.e above 8 CFM (Cubic feet per minutes).
11. The unit should incorporate both Visual Fuel Gauge display on battery for balance battery capacity at a glance and audible alarms to alert the user to low airflow.
12. There should be active flow technology to automatically respond to workers need for more or less air flow, regardless of filter type, hood type, filter loading, or battery capacity.
13. The unit should have single filter option for easy use and easy install.
14. The blower should be powered by a rechargeable battery pack fitted to the unit. Battery pack to be made available is 7 -8 hours battery lithium polymer battery rechargeable.
15. Electronic flow control giving known safe level of clean air i.e. above 8 CFM, 265 lpm (after initial flow rate setting).
16. The unit should have separate devices to check the airflow for both daily and periodic checking.
17. An Airflow check tube (Airflow indicator) to ensure the flow rate before each days work and the flow rate periodically.
18. Optimum performance should be maintained through durable 10,000 – hour brushless motor for superior reliability.
19. The blower unit should be having single filter design
20. The unit shall be designed for use in dusts mists, gases & vapour environment. There

8. POSITIVE AIR PRESSURE RESPIRATOR (PAPR)

should be organic vapors, acidic Gas & particulate filter with unique. The color coding of the filter must be as per the NIOSH Standards.

21. Filter cover should be available so as to prevent damage or sparks entering the filter body, allows shower decontamination and can enhance service life of filter.
22. Air should be drawn through single filters by the motor/fan unit and be delivered as clean air via a flexible breathing tube over the head and behind the visor and onto the users face.
23. The air should be exhausted at the bottom of the face seal together with exhausted breadth.
24. Respiratory protection of the blower unit and filter shall be in conformance to NIOSH standards.

Outlet flow Characteristics

25. Manufacturers Minimum Design Flow (MMDF): 8 CFM (265 lpm)
26. Maximum Flow: above 8 CFM.
27. The flow shall be such that it can be easily changed as desired before each use.
28. The unit shall be supplied with easily operational flow rate adjust tube apparatus with each unit separately.
29. Operating Conditions: -5 to + 40 deg C and < 90 % Humidity
30. End user product training on use, care and maintenance, fit testing of the PAPR shall be conducted by the supplier.
31. The head top should be of modular construction based on durable cradle and should combine protection for face and provides for respiratory protection and should be designed to be used with an approved air filter unit to form a respiratory protection device. The air should be fed via a breathing tube from a belt mounted air filtering unit to the back of the head top. The air should flow over the top of the wearers head and down in front of the face. The visor and face shield should prevent the ingress of contaminated air. The visor shall have stitched in air duct and should be made of cellulose acetate.
32. The assigned protection factor should be 1000. The Nominal protection factor should be 50 when connected to specifications NIOSH Standards.
33. The breathing tube shall be made of either Light weight Polyurethane or from Rubber and shall have an optional flame/spark retardant cover available.
34. The head top, breathing tube, to connect the head top and the blower shall be provided by the same supplier and be approved to be used in conjunction.
35. The firm shall demonstrate the performance of the system at our site.
36. The system shall be packed, supplied individually in break resistant suitable case/box, operating/ maintenance/cleaning manual to be supplied with the system.
37. The blower unit and the filter should have been approved as per NIOSH Standards.
38. Five years comprehensive warranty will be issued under regular AMC

Certified that the specifications are broad based, general in respect to the requirement and not suit to any particular firm/brand.

TECHNICAL SPECIFICATIONS

9. SINGLE CHANNEL MICROPIPETTES

1. The basic unit should comprise of a spring loaded tip cone for connecting tips tightly
2. The unit should have an adjustment opening for adjusting pipettes to a specific liquid and volume.
3. The pipette should have control button with very low operating force, color indication for pipette volume.
4. Tip ejector should have a low operating force, positioned for perfect ergonomics.
5. It should have Volume Display: 4 Digits with magnifier.
6. The system should have Perfect Piston System made out of Fortron.
7. The unit should have easy removable lower part for cleaning pipette
8. The whole unit should be fully autoclavable
9. The pipettes should be able to resist UV radiation discoloration.
10. The complete unit should be supplied with five years comprehensive warranty.
11. Volume range 0.1 – 3.0 µl, 2– 20 µl, 20 – 200 µl,100 – 1000 µl

Certified that the specifications are broad based, general in respect to the requirement and not suit to any particular firm/brand

TECHNICAL SPECIFICATIONS

10. REFRIGERATOR

1. The basic equipment should be a vertical type model.
2. The instrument should have double door with key locks on all doors.
3. The doors should be self closing and must have magnetic gasket
4. Should have a minimum capacity of 1000 litres or above.
5. It should have CFC free insulation and coolant.
6. The system shall have Should have foamed in place insulation (high density polyurethane foam)
7. The equipment must have polished aluminum preferable 40 grade exterior.
8. The unit shall have PVC coated adjustable shelves.
9. The equipment should be Microprocessor controlled
10. The system must have heavy duty spring loaded hinges.
11. The equipment shall contain fan motor for forced air circulation
12. It should be equipped with Digital LED display with audio-visual alarm
13. The unit must contain full length rust free stainless steel pull handles.
14. The wires in the equipment should be epoxy coated.
15. The exterior top and bottom should be made of galvanized steel
16. The equipment should have cold wall evaporator.
17. The unit shall be provided with 5 kva servo voltage stabilizer
18. The system shall be provided with 4 pin safety lock
19. The complete unit shall be provided under five years comprehensive warranty.
20. The unit must bear ISI/ISO/CE/ US-FDA/BIS certificate

Certified that the specifications are broad based, general in respect to the requirement and not suit to any particular firm/brand.

TECHNICAL SPECIFICATIONS

11. REAL TIME POLYMERASE CHAIN REACTION SYSTEM

1. The system should provide Touch Screen feature to avoid dependency on computer for operation (Standalone Mode), as well as it should be possible to use computer for system control, operation, analysis, net-working of multiple system and a USB port for data export
2. The system thermal cycling system must have the following features:
    - Peltier-based
    - The instrument should have user-interchangeable blocks to accommodate 96-well, 384-well block and micro fluidic Array Cards block
    - The system should be supplied with both 96 well block and micro fluidic Array Cards block
3. The system shall have effortless block exchange, without the need for any tools and there should be no recalibration should be necessary after a block change.
    - The optical system of the machine shall have detection by charged couple device camera and excitation by Tungsten Halogen Lamp.
    - The system should be 6 color system which combines 6 excitation (450–670nm) and 6 emission (500–720 nm) filter sets to enable collection for more than 20 unique combinations of dyes/wavelengths during a single run for multiplexing.
4. The system should be able to detect 1 copy of template for a single reaction.
5. The instrument should be open system capable of running various chemistries including probes like TaqMan and dyes such as SYBR Green etc.
6. The normalization of reaction should be possible by using any calibrated dye. Selection or de-selection of passive reference during the run should be optional
7. The system run time shall be < 35 minutes to complete 40 cycles
8. The system shall be able to support reaction volumes 5-30 µL for 96 well and 1µL for array card
9. The system shall have a temperature range of 4°C – 100°C and uniformity : +/- 0.50°C along with demonstrated dynamic log of upto 10
    - The system shall be supplied with 10000 extraction and amplification systems for COVID-19 and Swine H1N1.
    - The system shall be supplied along with installation kit offering a chemical installation kit with atleast 1.5-fold resolution for a singleplex reaction. This kit

11. REAL TIME POLYMERASE CHAIN REACTION SYSTEM

performance should be demonstrated during installation with over 99% confidence level

10. The system shall be supplied Softwares to support Applications including collect and analyze fluorescence data for the applications of absolute quantification, relative quantification, presence/absence assays, and allelic discrimination/SNP (Single Nucleotide, Polymorphism) detection.
11. The system shall be supplied with Multiuser user license (10 licenses) software for applications including absolute quantitation's, relative quantitation /gene expression/ SNP detection analysis. Multi user license software should also includes and supply statistical analysis tools like Box-Whisker plots to assess Ct, distribution, scatter plots and heat maps to assess sample correlation and quality.
12. The system shall be supplied with Multiuser license (at least 10 licenses) software for HRM application
13. The instrument software shall be able to control the instrument and analyze instrument's data from a remote computer within the same network.
14. The instrument software must provide endogenous control selection tool for gene expression experiments.
15. The instrument should be supplied with primer and probe design software.
16. The instrument should contains on-board storage capability with capacity for a minimum of 100 standard absolute quantification run files
17. The system should be supplied with suitable online UPS with 30 Min back up and a dedicated branded laptop for data analysis with following configuration –

    Operating system: Windows 10 or 8.1 (64 bit), Intel core i7 processor with Intel H87 chipset, 3.5 to 4 GHz, 3 to 4 Mb cache, hard disk with atleast 1 TB 7200 rpm SATA, intel HD graphics 4400 and atleast 4 to 6 USB ports , The system should be supported with 3 KVA online UPS with 30 min back up. The UPS itself should have a 5 year Comprehensive warranty from the date of Installation.

18. The complete unit shall be supported with training, service and application support.
19. The system shall be CE-IVD approved along with US-FDA approval.
20. Certified that the specifications are broad based, general in respect to the requirement and not suit to any particular firm/brand.