

Technical Specifications for Thermal Cycler

General Specifications:

- Gradient thermal cycler with peltier heating and cooling system. **May be upgradable to RT.**
- Sample block should have 96x 0.2 ml or 96x 0.2 ml well enabled to run fast chemistry.
- Block should have option of dual block of 2 X 48 X .2 ml and independently control for both blocks or the block should be able to run PCR for six different annealing temperatures in the same run if it has six zones.
- Function should have high through put with low sample volume.
- Maximum ramp rate should be 5°C/sec and average ramp rate of 3.3°C/ sec.
- Temperature control mode should be calculated and block independent.

Reaction module specification:

- Temperature range should be 0-100°C.
- Temperature accuracy of $\pm 0.2^\circ\text{C}$ of programmed target 0-99.0°C.
- Average temperature rate should have 3.3°C/ sec.
- Temperature uniformity should be $\pm 0.4^\circ\text{C}$ to 5.0°C well to well with in 10-20 sec of arrival at 90°C and have 6 thermo electrical modules.
- Should have gradient range of 30-100°C and have dynamic ramping for gradient.
- Temperature differential range should be 1-24°C.
- Memory should be 800-1,000 typical programs onboard, unlimited with USB flash drive expansion.
- Security features should be password protected folders, optional log in, and secured mode of high regulated environment.
- Instant incubation
- The system may support PCR volumes ranging from 10-30ul
- Automatic options for Step based graphical and text based programming.
- The software should have exportable run logs and system error logs.
- Option of using the instrument through a PC and maybe upgraded to RT-PCR
- USB peripheral compatibility (mouse, USB flash drive, bar code reader) should be available.
- Input power range should be 400W and frequency 50-60, single phase.
- PCR should be licensed.
- Online 6KVA UPS (APC) with 10 KVA SERVO.
- Warranty/Guaranty minimum three years with first one year free spare parts replacement options.

Technical specification for Real time PCR / RT Optical Module

Specifications:

- Base Thermal Cycler with Gradient capability or Universal Thermal Cycling capabilities.
- Sample block should have 96 well or 48 well with 0.2 ml or twelve 0.2 ml 8 tube strips.
- Sample Volume 10 μ l-30 μ l.
- Must be licensed for Real time PCR. Should be already up-graded/up-gradable to a fast system
- Detection of five different fluorescence reporters in the same tubes.
- Six excitation and six detection channels with 6 filter LEDs (450-684nm range) correspond to one dye that ensure smooth differentiation of even dyes having high degree of spectral overlap.
- Capable of detecting different fluorescence using SybrGreen/FAM, VIC/JOE.
- Maximum ramping speed should be 5°C/sec.
- Peltier cooling and uniform temperature control.
- Normalization of reaction due to non-PCR related fluctuation should be possible
- Should have one channel dedicated for FRET experiments.
- Light source having 6 filtered LEDs (preferably) in optical shuttle excitation and emission range 450-730 nm.
- Optical detection should have 6 photodiodes (preferably) in optics shuttle that allow target sequence detection via fluorescent detection chemistry.
- Dynamic range of minimum 9 orders of magnitude.
- The system should be able to detect more than one dye in each filter and number of dyes should not be synonymous with number of filters.
- Should be open where various chemistries can be performed.
- Multiplexing capability should have Up to 5 targets.
- The vendor should supply pre-validated RT-Assays for miRNA studies.
- Temperature range should be 0-100°C with accuracy of $\pm 2^\circ\text{C}$ and uniformity of $\pm 4^\circ\text{C}$ within 10 sec arrival at 90°C.
- Temperature differential rate should be 16-24°C.
- Multiple scan modes.
- Automatic allelic discrimination by end point fluorescence or threshold cycle.
- Gene expression analysis by relative quantity (ΔCt) or normalizing expression ($\Delta\Delta\text{Ct}$).
- Comparison of upto 5000 Ct values from different data files should be possible.
- Software should have express load features which allow entry of data after experiment.
- The instrument must be supplied with dedicated licensed full version software for primer and probe design with comprehensive assay design and development guidelines for quantitative and qualitative real time assays enable designing of specific custom oligo assays for different genes.

- The software should be capable of detecting and analyzing a gene, SNP or pathogen target in every well of the 96-well or 48-well plate
- The system should be pre-calibrated for at least five dyes
- It should support or come with or come with pre-validated and functionally tested gene expression assay as well as SNP genotyping assays.
- The software should enable simultaneous detection of multiple fluorphores.
- Instrument should be compatible to run with or without PC.
- Email notification facility should have to send alert on run completion alongwith data file as an attachment.
- Input power range should be 400W and frequency 50-60, single phase.
- Online 6KVA UPS with 10 KVA SERVO and a PC (branded and updated version) for data storage and analysis.
- Warranty/Guaranty minimum three years with one year replacement coverage.
- Vendor should quote base thermocycler (upgradable)/ RT PCR complete system/ RT Optical module, as applicable, separately.

Specification for Gel Documentation System

Specifications:

- The system should be image fluorescent DNA, RNA, and protein gels, colorimetric gels and blots and colony arrays.
- High resolution CCD camera: 1.4 mega pixel resolution with 1,360 x1,024 pixel array.
- Data acquisitions: 12 bit and 4,096 gray level and or Pixel size: 7.4µm x 7.4µm.
- Light tight cabinet to provide increase sensitivity to minimize background noise.
- The sample tray should extend out as drawer, enabling the user to perform band excision.
- Motorized control for zoom with numerical feedback and software acquisition preset integrated into an intuitive and easy to use interface along gel alignment templates, aperture & lens with broad range filter.
- Gel alignment templates matched to agarose or protein gel tray and ready gel.
- Filter for Fluorescent dyes such as EtBr/SYBR Green/SYBR Safe/Texas Red/SYPRO orange, coomassie blue, silver stain.
- Filter size having 25X26 cm area. Trans illumination area with White light converter Screen for viewing protein gels or similar features.
- Fire wire connectivity with fast data transfer.
- Minimum 3 position filter slider with amber filter.
- Software for imaging and analyzing 1-D electrophoretic gels, dot blots and colony counts. Software should be able to do:
 - Quantitate and analyze a variety of data.
 - Rapid molecular weight determination with choice of multiple regression models.
 - Band/lane matching analysis with comparative dandogram creation
 - Background subtraction correction of gradient gels
 - Accurate concentration analysis using sophisticated volume tools, volume box, volume circle, volume contour, or free hand drawing.
 - Local background subtraction for individual bands.
 - Colony counting that discriminates colonies and plaques.
 - Array tools to analyze and quantitate dot blots, slot blots, and medium density arrays.
 - Annotation tools to add text and lines.
 - 3 D viewer for critical analysis of closely spaced bands
 - Molecular weight determination
 - Volume overlays
 - Text and line overlays
 - Multiple illumination sources for imaging opaque samples
 - Dynamic range should be more than 3 orders of magnitude.
- A Branded work station- desktop Pentium IV computer, 1GB Ram, 160 GB
- HDD, CD –DVD Combo Drive, with 17” TFT monitor, windows XP Pro,
- Compatible for running the 1- D soft ware with suitable LaserJet