

TECHNICAL SPECIFICATIONS FOR HPLC-MS SYSTEM WITH TLC MASS INTERFACE

1. HPLC-MS System with TLC mass interface	
A versatile, modular, robust and reliable analytical system to identify and estimate diverse compounds of interest. An HPLC-PDA-MS system along with TLC mass interface must be quoted with all the required accessories, softwares, kits and parts as per following specifications:	
HPLC Specifications	
Pump	High pressure quaternary or binary pump that is able to deliver four or two solvents separately Mixer for proper mixing of four or two mobile phases Working pH range: 1-10
Flow rate	0.01-10ml/min with 0.01 increment Flow rate accuracy $\pm 1\%$ Flow rate precision should be less than 0.06% RSD
Injector	Auto sampler carryover: < 0.05 % RSD or better Injection Accuracy: 1 % Sample delivery precision: 0.3% RSD or better Sample cooler temp- 4 to 40° C Injection volume setting range: 0.1-100 μ l Equipped with auto-washing of syringe and tubings Additional syringes (No. 3) Rheodyne 10/20 μ l sample loop Racks and vials (1ml and 2ml, 100 each)
Pressure range	6000 psi or more
Degasser	Inline degasser for all channels Operating flow rate per line: upto 10 ml/min
System controller	Module to control the entire system, MS and TLC-MS interface
PDA detector	Wavelength range: 190-800 nm with aligned D ₂ & W lamp Noise : < $\pm 0.6 \times 10^{-5}$ AU or less Drift: < 1×10^{-3} AU/hr or less Simultaneous detection with multiple wavelength
Detection and analysis	Single point simultaneous detection and analysis by PDA and mass spectrometer
Column oven	Uniform heating with forced air circulation Temperature control range should be 4 to 40°C
Flow Cell	Temperature controlled cell for analytical operation
Columns	C8, C18, C30 - one each for analytical operation Respective guard columns/cartridges along with holders
Delay volume	Less than 200 μ l with a delay sensor
Softwares	Data analysis software for chromatogrm evaluation and processing, including spectral libraries and peak purity

	<p>functions.</p> <p>System suitability, System security as well as System check functions must be provided which comply with Good Laboratory Practice (GLP) and Regulatory Conformity</p> <p>Software should be 21 CFR Compliant</p>
IQ OQ PQ	IQ OQ PQ should be offered and provided.
<p>Mass spectrometer- Standalone as well as interfaced with LC system and TLC-MS with software for mass spectra recording of liquid/solid samples, for peak purity and comparison with spectral libraries.</p>	
Mass range	10 to 2000 m/z
Mass resolution	Unit resolution
Mass scan speed	10,000 amu/sec or better.
Ion Source	ESI and APCI (easily interchangeable)
Sensitivity	ESI sensitivity in SIM mode: 100:1 RMS for 1pg on column quantity of Reserpine or better. APCI sensitivity in SIM mode: 10:1 RMS for 1pg on column quantity of Reserpine or better
Infusion pump	Programmable infusion pump for direct sample injection In-built manual injector (syringes No. 3)
Polarity switching time	30 msec or less
Vacuum system	Should be of a quick and differential type with turbo-molecular and rotary pumps
Operation modes	Simultaneous data collection and processing
System softwares and mass libraries	The system will be used as front end as stand alone as well as mass detector for LC and TLC, hence all the required communication devices & cables and s/w, as required by system should be quoted. Complete system and software should be compliant to regulatory requirements. Single platform must be provided for a seamless control of all the modules of LC and MS and TLS-Mass interface. Mass library usage license should be comprehensive and for upgraded as and when required without any further charges.
IQ OQ PQ	IQ OQ PQ should be offered and provided.
Nitrogen generator	Nitrogen gas generator, 30 l/min with built-in compressor and accessories should be quoted.
Tuning and calibration	The system should be amenable to automatic calibration and tuning.
System maintenance	Simple interface for maintaining cleanliness of ion optics and capable of handling large batches of complex samples.
<p>TLC Mass interface- Standalone as well as with mass spectrometer with software programmable for plate type/size, extraction conditions and force of aspiration.</p>	
Aspiration mode	Automated, forced solvent aspiration with least adsorbant accumulation

Solvent pump	Separate solvent pump to be quoted along with accessories
Location of spots	Precise, preferably laser/UV guided location of spots on the analytical and preparative plates (20 x 20 cm or lesser)
Frits and filters	For more than 1000 application
Platform	Graduated with scale
Sample recovery	System for recovery of samples from plates for injection of eluted compounds to mass or LC system or for its separation
Cleaning and maintenance	Automated cleaning, purging and unplugging
System compatibility	Interface to be controlled by software and should be compatible with mass spectrometer and HPLC system
Other accessories	
Solvent filtration unit	Filtration unit along with oil free vacuum pump and accessories
Sonicator	Bath-type sonicator unit for at least 1x2 litre solvent bottles
Fraction Collector	Drive system : Arm movement (X-Y) system No. of fractions: 100 or more It should be flexibly applied for various fractionation both manual and continuous automatic fractionation. When exceeding the volume of the vial, the collector must automatically move to the next vial before it is overflow to prevent loss of precious fractions. 20 ml vials (200 pcs) with four racks
Solvent recovery system	Solvent recovery system supporting multiple sample processing to be quoted
Hardware	Branded PC with Pentium i7 processor or equivalent, 1 TB HDD, 8 GB RAM, full HD monitor, 22'' display and laser printer should be provided.
UPS	Online 10 KVA UPS for 2 hours backup should be quoted.
Warranty	Warranty for 3 years for complete system to be quoted. AMC for 3 years after the warranty period needs to be quoted separately.
Training and verification	Firm should provide at least 4 weeks application training at the laboratory besides on-site technical support. Installation workshop is to be fully supported by the supplier The technical specifications may be physically verified after the qualification of technical bid.

2. TLC Autosampler and ADC	
TLC Sampler	Fully automated sample application system with sampler and applicator for stand-alone and integrated function

	along with accessories and syringes. Control manual and through PC (along with software) Microprocessor controls for motors and gas valve
TLC Developer and Detector	System for development of plates and detection of spots Both automated and manual systems may be quoted
Warranty	Warranty for 3 years for complete system to be quoted.

Equipment for In Vitro Cell Culture Facility

3. CO₂ incubator For culturing animal cells including primary and cell lines	Volume: 150L or more Material: Stainless steel of AISI 316L grade Temperature: ambient + 5 °C to 50 °C (± 0.2 °C) Relative humidity: 60- 95% RH (±1 %RH) Carbon dioxide concentration range: 0 to 20% UV sterilizer: Inbuilt Digital display of temperature, Relative humidity and oxygen to Carbon dioxide ratio /CO ₂ level PID control for temperature, Relative humidity and Carbon dioxide level Stationary selves: 2 or more with front cover (Polycarbonate) Provision for Uniform temperature distribution, Relative humidity and Carbon dioxide gas trough out the incubator, Air jacketed temperature controlled Carbon dioxide gas cylinder (No. 2) with supply and control systems to the incubator Power backup system to run the incubator for minimum 10 hr in absence of main power supply Warranty: 3 year after installation
4. Inverted Microscope: Inverted microscope (Trinocular) for cell culture observation	Illumination: White LED illuminator with high luminescent Eyepieces: 15x Focusing: Vertical objective movement, Coaxial coarse/fine focusing Tubes: Trinocular tube (within main body) Nosepiece: Quintuple nosepiece (within main body), Backward-facing type Stages: Mechanical stage, can accept several types of micro-testplate holders Holder: Petri Dish Holder, Universal Holder, Terasaki Holder, Slide Glass Holder, Hemacytometer Holder Condensers: advanced modulation contrast (AMC) type Sliders: advanced modulation contrast (AMC) type Sliders Objectives: bright field 20X, 40 X and 60 X with optional advanced modulation contrast objective 20X and 40 X

	<p>Camera: 5-megapixel CCD camera attached to microscope for capturing microphotograph</p> <p>Display & analysis: software and hardware (PC) to analyze microphotograph with power backup</p> <p>Warranty: 3 year after installation</p>
<p>5. Bio safety cabinet</p> <p>Bio safety cabinet for cell culture handling under aseptic condition</p>	<p>Material: 18 gauge electro-galvanized steel 304 grade work zone and 18 gauge electro-galvanized steel with white oven-baked epoxy-polyester powder-coated.</p> <p>Front door: UV protective glass</p> <p>Size: 1220 x 760 x 2021 mm with stand base</p> <p>Vertical air flow with pre- and HEPA filters with down flow with low noise</p> <p>Filter efficiency : > 99.999% for particle size between 0.1 to 0.3 microns</p> <p>LCD display for continuous monitoring of cabinet airflow</p> <p>Germicidal UV lamp in the cabinet</p> <p>Service fixture (air, gas, vacuum) in the cabinet</p> <p>Fluorescent Lamp Intensity 1240 Lux</p> <p>Power back up system to run the Bio safety cabinet for minimum 1 hour in emergency</p> <p>Warranty: 3 year after installation</p>
<p>6. Micro plate reader</p> <p>To read the absorbance of bio-chemicals and assay samples in micro plate under UV-visible mode</p>	<p>Detection modes: UV-Visible Absorbance</p> <p>Micro plate types: 96 to 384-well plates including PCR plate</p> <p>Light source: Tungsten halogen and Xenon flash</p> <p>Wavelength range: 190 - 900 nm, 1 nm increment</p> <p>Wavelength selection: Monochromator</p> <p>OD accuracy:<1% at 2 OD; <3% at 3.0 OD</p> <p>OD linearity:<1% from 0 to 3.0 OD</p> <p>Wavelength range: 200 - 700 nm with xenon lamp</p> <p>Licensed, upgradable, lifelong Software</p> <p>Hardware (PC) with printer for analysis, calculation of results</p> <p>Power back system with online 3 KVA UPS</p> <p>Warranty: 3 year after installation</p>
<p>7. Ultra-low Temperature Freezer (-20°C deep freezer)</p> <p>For storage of bio chemicals and provisional storage of cells before cryopreservation</p>	<p>Deep freezer; Upright; 13 cu. Ft (363L)</p> <p>Controller with Standard SS Chamber with 5 Inner Doors</p> <p>Digital display of temperature and set temperature with</p> <p>Warranty: 3 year after installation</p>