	INDIAN INSTITUTE OF TECHNOLOGY BOMBAY **MATERIALS MANAGEMENT DIVISION** **Powai, Mumbai - 400076**

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TECHNICAL SPECIFICATION

Semi Preparative HPLC System

The Semi-Prep LC system shall include the following individual stackable modules

1. Pump for Analytical & Semi-Prep Flow Rates
2. Manual Injector with sample loops for 100uL, 200uL and 500uL.
3. Column Oven capable of holding analytical and semi prep columns.
4. UV Visible Detector with dual channel Acquisition capability.
5. Fraction Collector with suitable racks
6. Chromatographic Software

1. Pump for Analytical & Semi-Preparative flow rates

a) It should be high pressure binary pump with two individual flow lines
b) The pump should be able to handle flow rates ranging from those used in analytical scale to those in semi-preparative
c) It should be a serial dual piston pump/parallel type double plunger in-parallel pump with automatic pulsation correction mechanism achieving pulse-free solvent delivery
d) Maximum operating pressure should be **16MPa** or better
e) Flow rate should be settable between **0.1 mL/min to 40.00 mL/min** or better without any hardware changes
f) Flow rate accuracy should be ± 1% or ± 10 µl of set value whichever is larger
g) Flow rate precision should not be more than ± 0.08% RSD or 0.02 min SD
h) The gradient formation should be produced through high pressure mixing
i) Automatic rinsing of plunger should be available.
j) It should be supplied with, reservoir tray with 4 solvent bottles, fittings etc.
k) It should have a leak sensor as safety feature
l) Gradient mixers for analytical & semi-preparative scale should be supplied with pump

2. Manual Injection Valve with mounting accessories:

a) Manual Injection valve to be supplied capable of working in analytical and semi preparative flow rates.

b) Additional sample loops of 100uL, 200uL and 500uL to be supplied for semi prep scale up work.

3. Column Oven with heating & cooling:

a) Column Oven should be forced air circulation type for uniform temperature distribution
b) Temperature control range should be from **10˚C below ambient to 80˚C.**
c) Temperature control precision should be ± 0.1˚C
d) It should be possible to accommodate analytical as well as semi-preparative columns inside this column oven. It should support mounting of **3 columns** of 30cm length simultaneously.

4. UV Visible Detector :

a) The wavelength range should be 190 nm - 800 nm or better
b) A flow cell with <12 µL volume, 10 mm cell path length & 120 bar pressure should ne included.
c) It should also be supplied with preparative flow cell for semi-preparative applications.
d) Wavelength accuracy should be ±1 nm
e) The Drift should be **< 1×10^{-4} AU/h** or better
f) The Noise Level should be 4.5 x 10^{-6} AU or better
g) Linearity should be equal or more than 2.5AU (ASTM method)
h) Light sources and cell should be accessible from the front for easy maintenance

5. Fraction Collector with suitable racks and tubes:

a) It should be possible to use fraction collector over wide range of flow rates covering small as well as preparative scale work. It should adapt to applications such as manual collection while viewing chromatogram as well as advanced continuous & automated preparative separation & collection performed in combination with autosampler
b) It should be possible to perform fraction simulation using HPLC software
c) Even if elution time changes due to fluctuations in room temperature or composition of mobile phase, it should be possible to perform fractionation by catching target component
d) Appropriate racks with vials/tubes (for 4ml & 32ml) should be supplied
e) Fraction Collector should have below specifications

i.	Drive System:	Arm movement X-Y system
ii.	Minimum number of fractions:	10 to 100 (depending in type of rack used)
iii.	Collection method:	Solenoid Valve or direct through nozzle
iv.	Maximum flow rate:	50 ml/min or better
v.	Fraction Modes:	Basic mode & Time-Program mode

6. Chromatographic Software

a) Operation of the system should be very easy and intuitive via a state-of-the-art 32 bit Windows'10 based software
b) It should cover full one-point digital instrument control, qualitative and quantitative processing, report creation and self-diagnosis
c) Sample schedule wizard function should be available as standard with on-line help function
d) The reporting format should be flexible and easy to use in any desired format
e) The data can be converted to other formats. Spread Sheet software and word-processing software can be readily employed to provide data in tables
f) Software should allow automatic execution of system checks, auto-purge and baseline checks
g) System suitability, System security as well as System check functions must be provided which comply with Good Laboratory Practice (GLP)

7. Service, Warranty and Training:

a) Tendered price should include delivery, installation, commissioning and training (at least 4 users) at supplier's location. On-site installation, commissioning and training shall be conducted by a qualified engineers
b) Warranty for complete equipment for a period of at least 12 months should be provided.
c) Vendor to provide service guarantee: should the system require service during the warranty period, vendor must guarantee turn-around-time within 24 hours
d) Vendor to have logistic support to ensure that over at least 95% of the service parts are readily available and upkeep delivery within one week. Provide Site-Preparation checklist
e) Vendor must demonstrate that it has a proven appropriate set-up and capability to provide after-sales service efficiently and effectively.
f) One C-18 Column (5um, 4.6 x 250mm) columns should be supplied along with this system.
g) One C18 column with (5um, 21 x 250mm) columns should be supplied along with this system for semi prep scale up workflow.
h) All required kits, tubings, joints, tool kit etc. essential for running & maintenance of the system shall be supplied along with the system
i) Vendor must have branch office with service as well as application engineers based within Mumbai City.