



INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

MATERIALS MANAGEMENT DIVISION

Powai, Mumbai - 400076

Technical Specifications of Ultra-High Performance Liquid Chromatography System

RFx No. 6100001319 (Reference No. 1000030641)

I. Pump

1. Hydraulic system Two dual pistons in series pump with proprietary servo-controlled variable stroke design and smooth motion control for active damping.
2. Flow range Settable: 0.001 – 5 mL/min, in 0.001 mL/min increments (executed in 300 pL/step increments)
3. Flow precision ≤ 0.07 % RSD or 0.01 min SD, whichever is greater
4. Flow accuracy ± 1 % or ± 10 $\mu\text{L}/\text{min}$, whichever is greater
5. Pressure operating range more than 125 MPa (1250 bar)
6. Gradient formation: -High-pressure binary mixing
7. Delay volume: -As low as 45 μL (10 μL without mixer)
8. Composition range: - 0 – 100 %
9. Composition precision: - < 0.15 % RSD or 0.01 min SD,
10. Composition accuracy ± 0.35 % absolute

II. Auto Sampler

1. Injection range 0.1 – 20 μL in 0.1 μL increments
2. Injection precision < 0.25 % RSD of peak areas from 5 μL to 100 μL
3. Pressure range Up to 130 MPa (1300 bar, 18854 psi)
4. Sample viscosity range 0.2 – 5.0 cP
5. Sample capacity: -132 x 2 mL vial
6. Carryover < 0.004 % (40 ppm)

III. Column Compartment

1. Operating principle: - Thermostatted column compartment with dual, independent Peltier element.
2. Temperature range 20 °C below ambient (minimum 4 °C) to 110 °C

3. Temperature range increment Settable in steps of 0.1 °C
4. Temperature stability ± 0.03 °C
5. Temperature accuracy ± 0.5 °C (with calibration at 40 °C)
6. Temperature precision 0.05 °C
7. Independent temperature zones (in single device)
8. Up to 8 in clustered configuration
9. Column capacity 8 columns of 100 mm length plus Quick Connect fittings or pre-columns 4 columns of 300 mm length plus Quick Connect fittings

IV. Detector Photo Diode Array Detector

1. Detection type 1024-element photodiode array
2. Light source Deuterium lamp
3. Number of signals 8
4. Maximum data rate 240 Hz (both spectra and signals)
5. Drift $< 0.5 \cdot 10^{-3}$ AU/h at 230 nm
6. Linear absorbance range > 2 AU (5 %) at 265 nm, typically 2.5 AU (5 %)
7. Wavelength range 190 – 640 nm
8. Wavelength accuracy ± 1 nm, self-calibration with deuterium lines
9. Wavelength precision $< \pm 0.1$ nm
10. Wavelength bunching 2 – 400 nm, programmable in 1 nm steps
11. Slit width 1, 2, 4, 8 nm
12. Diode width ~ 0.5 nm
13. Nominal spectral resolution < 1 nm

V. SOFTWARE

Suitable Chromatographic software for smooth operation of UHPLC system with PDA and ELSD detector

VI. Warranty

Warranty for the system should be 12 Months