INDIAN INSTITUTE OF TECHNOLOGY BOMBAY
MATERIALS MANAGEMENT DIVISION

Powai, Mumbai 400076.

Item Description: High Performance Liquid Chromatrography with Photo-Diode and Refractive Index Detectors

PR No. 1000050879 **Rfx. No. 6100002471**

Sr. No	Detailed Technical Specification	Technical Compliance (Yes / No)	Additional Information (if any)
1.	**Application**: Quantitative analysis of 1-1000 ppm formic Acid/formate, formaldehyde, acetic acid/acetate in 0.1-5 M KOH solution. General : The vendor should quote for the latest model available and should guarantee for the availability of necessary spares and service support for next 10 years from the date of installation of the instrument at site.		
2.	Technically qualified vendors may be required to conduct a product demo at the Mechanical Engineering Department of IIT Bombay. It will be the vendor's responsibility to provide all necessary accessories and supplies for a successful demo. Vendors will have a reasonable period of 21 calendar days to arrange the demo from the product-demo notification date. Failure to conduct the demo within this timeframe from the date of notification will result in a disqualification. Additionally, vendors who do not meet the technical requirement(s) during the demo will also be disqualified. Each vendor will be allowed a maximum of one demo session, with no possibility for rescheduling or repeat demonstrations. All expenses associated with the demo at IIT Bombay will be borne by the vendor.		

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3.	**System :** The system should be an automatic computer controlled Quaternary High-Performance liquid chromatograph with suitable software equipped with a suitable pump, auto sampler, Column Compartment with heating and cooling, Photodiode array Detector, and Refractive Index Detector capable of working in both isocratic & gradient operations. Should have the provision for complete upgradation capability (module wise and system wise) in future		
3.	**Graphical Interface :** i. Should be able to perform and schedule automated task like auto-startup and auto-shutdown.		
	ii. Should have basic hardware maintenance guide in the screen.		
	iii. Should have basic chromatographic troubleshooting guide like pressure, peak shape, baseline and retention time related problems.		
	iv. Should have instrument consumable trends.		
	v. Should have solvent consumption and injection trends.		
4.	**Quaternary pump :** i. Pump should provide error-free programming of pump parameters including flow rates, operating pressure limits, compressibility compensation, calibration and diagnostics.		
	ii. The Solvent Delivery Unit (Pump) should be capable of operating with 2 or more Solvents at a time during gradient operation limits, compressibility compensation, calibration and diagnostics.		
	iii. iii. Pump mechanism should be hydraulic.		
	iv. iv. Number of solvent channels should be four.		
	v. v. Settable flow rate range should be from 0.001 – 10 mL/min, in 0.001 mL/min increments.		
	vi. vi. Flow accuracy should be ± 1 %.		
	vii. vii. Flow rate precision should be ≤0.07 % RSD.		
	viii. viii. Must have an operation pressure range of 0-400 bar or more.		
	ix. ix. Should have a pH range 1.0 — 12.5 or more		
	x. x. Inbuilt degassing unit with internal degassing volume not less than 1.5mL for each channel should be available for 4 channels or more.		
	xi. xi. Composition range should be settable: 0 – 100 % in 0.1 % increments.		

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	xii.	xii. Electronically controlled inlet valve for higher organic mobile phases & high strength buffers.		
	xiii.	xiii. Should have leak sensor.		
5.		**Auto sampler :**		
	i.	The auto sampler must have a capacity to hold a minimum of 12 vials in 2 mL vials, or better		
	ii.	Must have an operation pressure range of 0 – 550 bar or better.		
	iii.	Injection range should be 0.1 to 100 µL.		
	iv.	Injection precision should be <0.25 % RSD.		
	v.	Sample viscosity range should be 0.2 – 5.0 cP.		
	vi.	Injection cycle time should be 20 s or better.		
	vii.	Should have advanced features like auto addition, auto derivatization, auto dilution, premixing and needle rinsing programs.		
	viii.	Should have leak sensor		
6.		**Column compartment :**		
	i.	The Column heater should have Temperature range of 10 °C below ambient to 85 °C		
	ii.	Operating principle should be thermo-statted column compartment with 2 or more, independent Peltier-element		
	iii.	Temperature accuracy should be ±0.5°C.		
	iv.	Temperature stability should be ±0.1 °C.		
	v.	Temperature precision should be ±0.05°C.		
	vi.	There should be a minimum of 2 independent temperature zones in a single device.		
7.		**PDA detector :**		
	i.	Wavelength range: 190-950 nm or better.		
	ii.	Wavelength accuracy: ± 1 nm or better.		
	iii.	Slit width: Programmable for 1, 4, 8 nm or better		
	iv.	Noise: +/- 0.7 x 10^{-5} AU at 254 nm or better.		
	v.	Detector Type: 1024 element Diode Array		
	vi.	Data Rate: 120 Hz or better.		
	vii.	Light Source: Deuterium lamp and tungsten lamp		
	viii.	Standard flow cell for Analytical Workflow.		
	ix.	Should have leak sensor.		
	x.	10 .Second generation of Electronic temperature control (ETC) for the complete optical unit should be available.		
8.		**RID detector :**		
	i.	Refractive index range: 1.00 – 1.75 RIU		

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	ii. Measurement range ±500 X 10^{-6} RIU		
	iii. Optics temperature control should be available from 5 °C above ambient to 55 °C		
	iv. Short term noise: <±1.25 X 10^{-9} RIU		
	v. Drift: <200 X 10^{-9} RIU/hr		
	vi. Data rate: 60 Hz or higher		
	vii. Flow cell Volume: 6 µL (or higher) with maximum pressure of 5 bar		
	viii. Optical zeroing should be Digital via software and manually via set screw		
	ix. Valves should be available for Automatic purge and automatic solvent recycle		
	x. Should have leak sensor.		
9.	**Chromatography Data Software :** Chromatography Data system should have 32/64-bit design for windows 10/11 or compatible software. Real time triggers to react the condition i.e. to take action on Fault, Stop, Start, wavelength switching, injection etc. The software should be genuine & original**.**		
10.	**Consumables** : Following consumables should be supplied with the system: i. 1000 HPLC vials Transparent		
	ii. 1000 HPLC vials Amber Colored		
	iii. Additional D2 Lamp for PDA detector – 2 in number		
	iv. PTFE Frits – 25 nos		
	v. PEEK Ferules – 25 nos		
11.	**Warranty :** one-year on-site warranty. If the reported malfunction is not resolved within 30 days from the date of official notification, the vendor shall provide a replacement or new equipment.		

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