

## HPLC

### **Supply, Delivery, Installation and Commissioning of Completely Modular High Performance Liquid Chromatography System With Accessories.**

The HPLC system shall include the following individual stackable self-contained modules. Modules must be connected via fibre optic noise resistant high-speed transmission technology to enhance the reliability and sensitivity of the HPLC

1. Solvent Delivery System with degasser
2. Autosampler with sample cooler
3. Column Oven with heating & cooling capacity
4. Photo Diode Array Detector
5. Chromatographic Software

Below are details of each of these individual modules. Vendor shall supply HPLC system with either similar or better specifications

#### **1. Solvent Delivery System for Analytical Flow Rates with degasser:**

- It should be parallel type double plunger with automatic pulsation correction mechanism achieving pulse-free solvent delivery. Plunger capacity should be 10ul or better with increment of 0.0001 ml
- The flow rate should be settable between 0.0001 to 10.0000 ml/min without any hardware changes
- Flow rate accuracy should be  $\pm 1\%$  or  $\pm 2 \mu\text{l}/\text{min}$  of set value whichever is larger
- Flow rate precision should be  $\pm 0.06\%$  RSD or better
- Pressure setting range should be 40 MPa or better
- The gradient formation should be through quaternary low pressure gradient mixing
- The precision of composition must be less than 0.1% RSD.
- It should employ active check valves for stable delivery of non-polar organic solvents
- Automatic rinsing of plunger must be available
- It should be capable of standalone operation
- It should be supplied with Reservoir tray with 4 solvent bottles complete with fittings
- It must have a leak sensor as safety feature
- It should incorporate membrane type degassing unit upto 5 flow lines
- Internal capacity of degasser should be 400  $\mu\text{l}$  or better per flow line

#### **2. Autosampler with sample cooler:**

- Sample injection volume should be variable between 0.1  $\mu\text{l}$  to 500 $\mu\text{l}$
- Injection system should be variable injection volume type with zero sample loss during injection

- Number of samples to be processed automatically, random access up to 175 positions for 1ml vial volume. 192 for 2X96 wells microtitre plates, 768 for 2X384 wells microtitre plates, 192 for 2X96 wells deep-well plates
- Flow line rinse capability both before and after sampling should be possible
- Needle aspiration speed should be variable from 0.1 to 15µl/sec
- It must be capable of a carry-over no more than 0.0025 %
- Injection volume accuracy within 1%
- The injection precision should be less than 0.3% of RSD
- It should have a leak sensor, automatic rack and vial recognition as safety feature
- Supply of at least 100 sample vials of 1.5ml capacity, complete with caps and septa should be included
- The autosampler should consist inbuilt cooler, operating temperature from 4°C to 40°C
- Both analytical and semi-prep sample injections are possible with same autosampler.

### **3. Column Oven:**

- It should be block heating type & should have electronic heating as well as cooling for uniform temperature distribution
- The temperature setting range should be 4°C to 80°C
- Temperature control precision should be  $\pm 0.1^\circ\text{C}$
- It should be able to handle up to 2 columns of 25 cm length
- It should have a leak sensor
- Switching between analytical column to semi-prep column should be possible without changing any hardware.

### **4. Photodiode Array (PDA) Detector:**

- The wavelength range should be 190 nm - 800 nm or better
- The photo-diode array detector should have 1024 elements.
- The detector should have variable slit width for high resolution as well as high sensitivity
- A standard flow cell of 12µL volume, 10 mm path length & 12 MPa should be available
- The flow cell should be temperature controlled from 19°C to 50°C
- Wavelength accuracy should be  $\pm 1$  nm & wavelength precision should be  $\pm 0.1$  nm
- A deuterium lamp [D2] and a Tungsten lamp [W] should be available as Light Source for UV and visible wavelengths respectively.
- The selection of light source should be flexible to select D2, W or both [D2 +W] the lamps for analysis
- The Drift should be  $0.4 \times 10^{-3}$  AU/h or better
- The Noise should be  $4.5 \times 10^{-6}$  AU or better
- Linearity should be equal or more than 2.5 AU (ASTM method)
- It should have a self-aligning mechanism for the light sources and cell
- Light sources and cell should be accessible from the front for easy maintenance

## **5. Chromatography Software:**

- Genuine & compliant chromatography software should be supplied with HPLC system
- It should cover full one-point digital instrument control, qualitative and quantitative processing, report creation and self-diagnosis
- Sample schedule wizard function should be standard with on-line help function
- The reporting format should be flexible and easy to use in any desired format
- The data should be convertible to other formats
- The software should allow automatic execution of system checks, auto-purge and baseline checks etc.

## **Service, Warranty and Training**

1. Tendered price should include delivery, installation, commissioning and training (at least 4 users) at supplier's location
2. Warranty for complete equipment for a period of 24 months from date of supply should be provided. This shall include the following at no extra cost:
  - Travel and Labour expenses of Customer Engineer
  - Service Parts used for repairs
3. Vendor to provide service guarantee: should the system require service during the warranty period, vendor must guarantee turn-around-time within 24 hours
4. Vendor to provide a copy of Site-Preparation checklist
5. Vendor must demonstrate that it has a proven appropriate set-up and capability to provide after-sales service efficiently and effectively. The supplier should have in his facility a similar system to that proposed in this tender for training purpose
6. One Analytical C-18 Column (5um, 4.6 x 250mm) And One Semi-Prep C-18 Column (5um, 10mm) should be supplied along with this HPLC system
7. All required kits, tubings, joints, tool kit etc. essential for running & maintenance of the system shall be supplied along with the system
8. The vendor must be reputed one having experience of at least 20 Years for supply of HPLC & Preparative LC systems. They must have more than 10000 installations of HPLC, UHPLC & Preparative LC systems in India. Also vendor should have at least 350 installations of LCMS & LCMSMS systems in India. They should have their own facility within Mumbai for demo / training purpose having similar instrument which has been quoted here. Vendor must have service as well as application engineers based within Aurangabad region.
- 9. Please include the list of minimum 10 users in nearby Wardha.**