SkyHan Series

EX1800 UHPLC/HPLC

**Ultra High Performance /
High Performance Liquid Chromatography System**

Wufeng's commitment to innovation and practice in HPLC instrument in the last two decades, we have launched our new flagship high-performance liquid chromatographic system EX1800 to the market. The EX1800 is an integrated UHPLC / HPLC instrument (with ultra-high-efficiency and ultra-performance configurations), it provides flexibility to accomplish testing range from separation power for complex samples with speed or to daily analysis. From the exterior design to the internal technology structure, all of them highlight Wufeng's forward-looking and foreseeable ideas in liquid chromatography's market. We named our flagship UHPLC / HPLC under two Chinese characters "Skyhan" based on the deep understanding and feelings of the self-confidence and pursuit of China's long-standing cultural spirit and heritage, "Sky" as Infinite Sky & "Han" as a nationality stem from their worship and awe.

Details define quality from visible to invisible

- Designed by an Internationally awarded Companies
- With full functional configuration to meet various application needs of industries
- The infusion unit is driven by a linear motor with leading technology, which significantly improves the accuracy and precision
- Easily deal with complex samples by the strong separation performance of two-dimensional separations system
- Professional workstation software, are complies with GMP, FDA 21 CFR, 3Q and other regulatory certification requirements

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Solvent Organizer

Optional facilities: The binary gradient system, equipped with a new Solvent Organizer Unit, expands the two mobile phases into 4 mobile phases immediately. By using Exforma's chromatography workstation software, it enables easy separate switching and combined switching of 4 mobile phases. It is convenient for the user to switch the mobile phases after each different sample test, and achieve automatically rinse for better user experience. The solvent organizer can choose the built-in degassing unit and the column thermostat according to the user's needs.

Autosampler

AI technology enables human-machine dialog, allow device to detect fault alarm, alert prejudgment, status monitoring, and other functions. With an upgraded smart self-protection function, it provides protection of thimble, needle blocking, liquid leakage & etc.

Detectors

UV/VIS Detector, FLD (Fluorescence detector), PDA (Photo-Diode Array), RID (Refractive Index Detector), ELSD (Evaporative Light Scattering Detector), ECD (Electrochemical Detector).
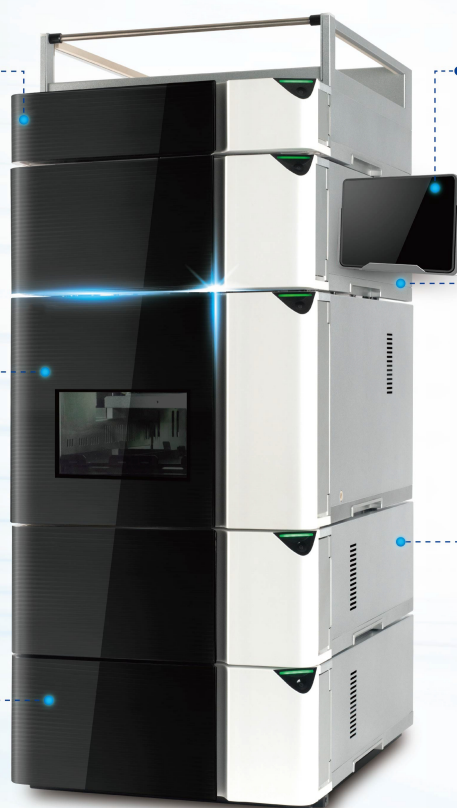
Wireless Control System

Offline Remote control or use of handheld terminal for remote system control via APP

Infusion System

Optional facilities: Ultra-high-performance binary Infusion System (120MPa), Ultra-high-performance binary Infusion System (62MPa, 90MPa), Quaternary Infusion System (70MPa)

Column Management System

Optional facilities: Standard / Super column management system, integrate multi-column thermostat system and multi-flow control system. With two Binary high-pressure pumps can comply with multi-combination of applications such as dual binary pumps in series, dual binary pumps in parallel, online solid phase extraction, different application switching, two-dimensional or multi-dimensional chromatographic analysis & etc.

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Binary Pump

- Configuration: Ultra-high-performance binary Infusion System (120MPa), Ultra-high-performance binary Infusion System (62MPa, 90MPa)
- Ultra-high-performance binary infusion system can be equipped with two types of infusion device
  Type I: Reciprocating infusion pumps, High flow accuracy, Low pressure pulsation
  Type II: Linear motor digital-driven pump, Infusion stability, Mixing accuracy
- Solvent type selection according to the mobile phase, and automatic adjustment of liquid compression compensation
- Automatic post-column rinsing, the cleaning flow rate can be controlled according to actual needs

EX1800 UHP/UBP

Infusion System:	Linear motor digital-driven pump
Flow range:	0.001 – 5mL/min, n0.001mL/min increments
Maximum operating pressure:	120MPa (corresponding 17000psi)
Flow precision:	≤0.06%RSD
Flow accuracy:	≤±0.3%
Compression compensation:	Automatic, continuous, selectable solvent type
Post-column cleaning:	Automatic post-column cleaning function, which can control the cleaning flow rate
Gradient setting range:	0-100%
Extended application:	Record number of times the plunger rod seal is used

EX1800 UHP/UBP

Infusion System:	Type I Reciprocating infusion pumps
	Type II Linear motor digital-driven pump
Flow range:	0.001 –10mL/min, n0.001mL/min increments
Maximum operating pressure:	62MPa (corresponding 9000psi), 90MPa (corresponding 13000psi)
Flow precision:	≤0.06%RSD
Flow accuracy:	≤±0.3%
Compression compensation:	Automatic, continuous, selectable solvent type
Post-column cleaning:	Automatic post-column cleaning function, which can control the cleaning flow rate
Gradient setting range:	0-100%
Extended application:	Record the number of times the plunger rod seal is used

Quaternary Pump

- Maximum pressure of the quaternary pump can reach to 70MPa
- Solvent type selection according to the mobile phase, and automatic adjustment of liquid compression compensation
- Automatic post-column rinsing, the cleaning flow rate can be controlled according to actual needs
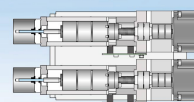
EX1800 UQP/QPC

Infusion System:	Linear motor digital-driven pump
Flow range:	0.001 – 10mL/min, n0.001mL/min increments
Maximum operating pressure:	70MPa (corresponding 10150psi)
Flow precision:	≤0.06%RSD
Flow accuracy:	≤±0.3%
Compression compensation:	Automatic, continuous, selectable solvent type
Post-column cleaning:	Automatic post-column cleaning function, which can control the cleaning flow rate
Gradient setting range:	0-100%
Online degassing:	Degassing channel Systec AF®
Degassing chamber:	480μL
Extended application:	record the number of times the plunger rod seal is used

Linear motor digital-driven pump brings comprehensive advantages

- The linear motor drive design structure accurately controls the suction and discharge process of each infusion pump through digitalization
- Combined with artificial intelligence DDPG & the large amount of experimental data, it establishes an accurate data module– Strategy Control Expert Database
- Under the Strategy Control Expert Database, user can set any flow value, or under any actual load pressure, AI will adjust the operating speed and phase of each infusion pump to achieve precise and constant infusion
- Optimize the gradient curve to reduce the gradient delay time

linear motor digital-driven pump

Completely solve the congenital deficiency of the traditional lobe pump infusion unit

- Delay of Damper, unsolvable system delay effects
- Non-guarantee the accuracy of gradient mixing in extreme proportions
- Stability of micro-flow infusion under ultra-high pressure above 80Mpa

The Linear motor digital-driven pump is a revolutionary advancement in the infusion unit.

NEW

UV Detector

- The newly designed circuit system and light path structure greatly improve the sensitivity of the detector
- Optional: UV detector and ultra-efficient UV detector
- Usage of 2000 hours of high-performance deuterium lamp
- Front-loader flow cell and light path structure design, easy to maintain and replace
- Continuously perform spectral scanning or absorbance measurement under 2 wavelengths （EX1800 UV D）

EX1800 SUV　　High-efficiency Ultraviolet Light Detector

Flow cell:	volume 1.0μL; adopts cone structure / With optional temperature control module
Light source:	Deuterium lamp
Wavelength range:	190-700nm
Spectral bandwidth:	4nm
Wavelength accuracy:	±1nm
Wavelength precision:	<0.1nm
Noise:	≤0.25*10⁻⁵AU (static)/≤4*10⁻⁵AU (dynamic, under specified test conditions)
Drift:	≤0.4*10⁻⁴AU/h (static)/≤5*10⁻⁴AU/h (dynamic, under specified test conditions)
Sampling frequency:	Up to 100HZ

Noise: ≤$0.25*10^{-5}$AU (static)/≤$4*10^{-5}$AU (dynamic, under specified test conditions)
Drift: ≤$0.4*10^{-4}$AU/h (static)/≤$5*10^{-4}$AU/h (dynamic, under specified test conditions)

EX1800 UV/UV D　　Ultraviolet Light [Uv] Detector　　EX1800 UV VIS

Flow cell:	Volume 10.0μL; adopts cone structure / With optional temperature control module		
Light source:	deuterium lamp	Light source:	Deuterium lamp + tungsten lamp
Wavelength range:	190-700nm	Wavelength range:	190-900nm
Spectral bandwidth:	8nm		
Wavelength accuracy:	±1nm		
Wavelength precision:	<0.1nm		
Noise:	≤$0.25*10^{-5}$AU (static)/≤$4*10^{-5}$AU (dynamic, under specified test conditions)		
Drift:	≤$0.4*10^{-4}$AU/h (static)/≤$5*10^{-4}$AU/h (dynamic, under specified test conditions)		
Sampling frequency:	up to 100HZ		

PDA Detector

- Spectral scanning or absorbance measurement can be performed continuously at a frequency of 100 Hz under 8 wavelengths
- The wavelength range is 200nm to 800nm, adjusted in 1nm increments
- Both deuterium lamp and tungsten lamp use built-in counter to calculate working time
- Support 3D spectrogram

EX1800 PDA

Number of diode arrays:	1024	Drift:	1*10-4AU/h, under specified conditions
Light source:	deuterium lamp + tungsten lamp	Sampling frequency:	up to 100HZ
Wavelength range:	200-800nm	Spectral bandwidth:	10nm
Wavelength accuracy:	±1nm	Flow cell path length:	5mm (10mm is optional)
Wavelength precision:	±0.5nm		Up to 8 channels of digital signal output
Noise:	±5*10-6AU, under specified conditions		

FL Detector

- Use high-performance flash xenon light source
- With the newly designed optical system, achieved high sensitivity and fast analysis capabilities

EX1800 FL D

Light source:	Xenon lamp	Wavelength reproducibility:	±0.2nm
Wavelength range:	190-890nm	Flow cell path length:	Standard flow cell 12μL
Spectral bandwidth:	6nm, 8nm, 18nm, 40nm		
Wavelength accuracy:	±2nm		

ELS Detector

- Super long life laser light source
- Special designed constant temperature device to ensure the Stability of the evaporation temperature
- Built-in gas mass flow control system, not affected by pressure changes Special designed temperature-controlled atomizer to prevent instability
- caused by the atomization process

EX1800 ELSD

Light source:	650nm laser, maximum output 30mW
Atomizer (nozzle) temperature control range:	3°C-80°C above room temperature, with 1°C step
Drift tube temperature control range:	3°C-130°C above room temperature, with 1°C step
Drift tube temperature stability:	±0.03°C
Gas flow setting range:	0.0-5.0 L/min
Noise:	≤0.015mV
Drift:	≤0.025mV/30min

RI Detector

- The dual temperature control system shortens the time from turning on the power switch to the stabilization of the instrument, and ensures good baseline stability
- Have a leak sensor

EX1800 RI

Refractive index range:	1.00-1.75RIU
Detection range:	0.25-512μRIU
Noise:	≤2.5nRIU (pure water response time: 1.5 seconds)
Temperature control:	Off, 30°C-50°C, with 1°C step
Flow cell volume:	8μL

Column Organizer

- Column Compartment Thermostatting and Preheating for Temperature to reduce temperature changes so that the chromatographic peak shape can be more symmetrical
- Large-capacity structure, convenient to place 4 x 30cm chromatographic columns or 8×5cm,10cm ultra-efficient columns
- With multi-channel switching valve, can achieve chromatographic column switching or multi-dimensional liquid phase applications

EX1800 CO		EX1800 CO II
Temperature control range:	5℃-80℃ above room temperature	15℃-80℃ at room temperature (minimum setting temperature 4℃) Semiconductor refrigeration module
	Ceramic heating module	
Temperature stability:	±0.1℃	
Temperature accuracy:	±0.5℃	
	Up to two pre-post preheaters	
Column capacity:	up to 4 x 30cm columns (ultra-efficient columns 8×5cm,10cm), Optional: column switching valve	
Temperature control method:	microcomputer controlled active air circulation	

Solvent Organizer

- Equipped with online vacuum deaerator
- Basically provides 4 degassing channels to achieve 4 mobile phase degassing
- Two-way mobile phase switching valve can be configured, to expand the original two-way mobile phase input of the binary high-pressure gradient to two sets of two (4 in total) mobile phase input
- Degassing channel Systec AF® - degassing channel volume is 380µL/channel

Autosampler

EX1800 UAS U/AS

Type I: The number of samples: With total two side, each side can choose one type of tray. The system automatically recognizes the tray specifications.
Maximum number: 1mL×192; 2mlL×108 (standard configuration); 4mL×70; 10mL×30;
Type II: The number of samples: With total two side, each side can choose one type of tray. The system automatically recognizes the tray specifications.
Maximum number: 1mL×330; 2mlL×192 (standard configuration); 4mL×108; 10mL×48;
Cross contamination: ≤0.005% (specified cleaning procedure)
Injection volume: 0.1-120µL (determined based on the sample loop)
Injection accuracy: Full sample loop, RSD6≤0.25%; partial quantitative loop, RSD6≤0.5%
Automatic protection function: Alarm for lack of bottle, thimble alarm, pipeline blockage alarm, leakage alarm
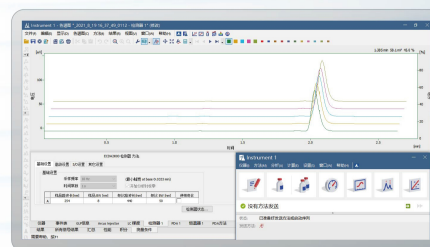**Refrigeration function:** Optional refrigeration module

- Self-protection function, misoperation preventing, effectively reduce serious damage to equipment caused by misoperation
- The injection range is 0.1~120µL, ensuring high-precision injection of both large and small-volume samples
- Various optimization measures are adopted to reduce cross-contamination of samples Up to 330(1mL) can be placed;
- Provides two options: standard and ultra-efficient
  - Quadruple protection device, with optional: refrigeration function
  - Programmable sampling program, sample pretreatment, automatic dilution, automatic pre-column derivatization and other functions
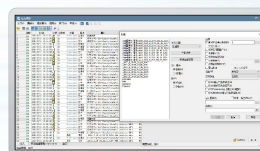
EX-Clarity Workstation

One to four independent detector signals can be collected, various forms of 24-bit high-precision chromatographic signal acquisition mode. With digital control of chromatograph and autosampler.
The workstation conform to the data validity, security, system authentication tools (IQ/OQ) and system suitability testing (SST), and others specifications. Efficient batch processing streamlines the whole process of instrument control, auto sampler sequence acquisition, automatic integration calibration and output report. It also features powerful post-processing, chromatogram comparison, re-calibration, data input and output, three-dimensional chromatogram processing.

Post-processing interface
The interface is simple and fully functional. Contains powerful post-processing, which can use the 3D view mode on the basis of superimposed chromatogram.
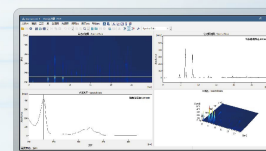

EX-Clarity Workstation interface

Detection and tracking

Efficient data processing, using batch processing to perform chromatogram integration, content calculation and other operations on a large number of spectra. The batch processing process will also be displayed on the inspection and tracking interface of the workstation in real time.

3D chromatogram

Sample injection in PDA mode can obtain more information, faster data processing, and also obtain 3D chromatograms of chromatographically separated components, providing analysts with a wealth of qualitative and quantitative information.
Both 3D chromatograms and full-wavelength scans can be extracted. After collecting the data, the three-dimensional image and the full-wavelength scan image can be extracted with the processing software