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LC3400

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LC3400 SERIES
HIGH-PERFORMANCE
LIQUID CHROMATOGRAPHY SYSTEM

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More trustable With forever

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LC3400
High-performance Liquid Chromatography System Series



Rapid Separation Liquid Chromatography(RSLC)System

01

◆ **Separable Modular Structure:** Multiple RSLC main unit models available for customizable configurations.
◆ **Comprehensive Detector Range:** Includes UV, DAD, FLD, ELSD, and RID detectors with intelligent control.
◆ **Smart Lab Workstation:** Simplifies complex tasks with user-friendly interfaces.
◆ **Proprietary Chromatography Consumables:** Self-developed chromatography consumables.

Innovative Needle-in-Flow Injection System

02

◆ **Needle-in-Flow Injection System:** Eliminates sample loss and minimizes cross-contamination.
◆ **Advanced Online Functions:** Supports online derivatization, dilution, and enrichment.
◆ **Optimized Needle Cleaning:** Innovative design reduces contaminati on risk.
◆ **Global Standard Performance:** Ensures top-tier qualitative and quantitative reproducibility.

Extended Functions to Meet Diverse User Needs

03

◆ **Enhanced Compatibility:** Innovative one-way valve technology ensures acetonitrile compatibility.
◆ Column oven with valve switching, providing 2 installation clips for 250mm HPLC columns, expandable to 4+ columns.
◆ **Innovative Technology:** Effectively identifies shoulders and small peaks with guided operation and intelligent integration.

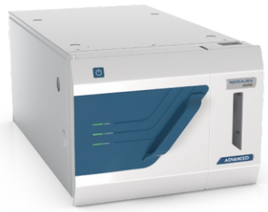
KEY COMPONENTS

High-Pressure Pump



◆ Maximum Pressure and Compatibility: Capable of withstanding up to 75 MPa, compatible with smaller particle size chromatographic columns, enabling seamless method transfer.
◆ Acetonitrile-Resistant Valve: Features a high-precision, self-restoring, acetonitrile-resistant one-way check valve, ensuring stable fluid delivery in acetonitrile applications. The further optimized two-stage floating patent technology significantly reduces wear on high-pressure seals, extending the lifespan of consumables.
◆ Flow Stability and Gradient Accuracy: Proprietary fluid compression compensation technology with real-time feedback electronic pulsation suppression control ensures stable flow and precise gradient accuracy.
◆ Quaternary Pump with Degassing: Quaternary pump integrated with 5-channel degassing (A, B, C, D, AS).
◆ Binary Pump with Solvent Switching: The binary pump comes with a standard solvent switching valve, enabling binary and four-way expansion for analysis.
◆ User-Friendly Design: Standardly equipped with a touch panel switch, meeting the needs for offline operation and human-machine separation.

Autosampler



◆ Needle-in-flow design ensures zero sample loss during injection.
◆ Compatible with different specifications of sample trays, expanding user application scenarios.
◆ Metering pump for precise sampling, offering longer lifespan and higher accuracy compared to syringe pumps.
◆ Optimized and innovative needle cleaning flow path minimizes cross-contamination, ensuring sample purity.
◆ Standard obstacle object protection function to effectively avoid damage to the injection needle.
◆ Standard empty bottle detection function to prevent invalid sample injection.
◆ Full range of sample pretreatment functions supporting online enrichment, online derivatization, online dilution and mixing, further expanding user method development scenarios.
◆ Optional refrigeration component to ensure detection accuracy of thermally unstable substances.
◆ Optional condensation peristaltic pump active drainage function to effectively prevent damage to the equipment from overflow of condensation accumulation.
◆ Pump and autosampler can be linked for purge operation, eliminating the need for manual purge valve operation.

Column Oven



◆ Default configuration with semiconductor cooling module and electric-resistive heating module, achieving full temperature range control with heating and cooling functions. Two control modes ensure longer lifespan and higher reliability of temperature control components.
◆ Forced air circulation for precise and uniform temperature control throughout the chamber.
◆ Standard preheating module with the same temperature range as the set temperature to ensure optimal temperature consistency.
◆ Multi-column capacity design supporting up to 3 chromatographic columns of 300mm .
◆ Supports upgrade to 2D configuration with built-in high-pressure switching valve , and can be expanded to support multiple external switching valve .
Optional chromatographic column GLP information recording function.

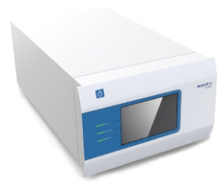
Full Range of Liquid Chromatography Detectors

Diode Array Detector



◆ Capable of acquiring chromatographic signals across all wavelengths from **190 to 800 nm**, exhibiting detailed spectral structures.
◆ Features a high-intensity deuterium lamp, concave holographic grating, **1024-element photodiode** array, and all-solid-state, highly stable optical path structure.
◆ Provides three-dimensional spectra, contour plots, chromatograms, spectra, maximum intensity plots, and other information to support multiple application needs, including advanced functions such as peak purity calculations.
◆ Achieves extreme low signal noise and drift through independent chamber temperature control, active fan speed control, and passive temperature stabilization of internal materials.

Refractive Index Detector



◆ Designed with a two-chamber configuration and upgraded to a long-life LED light source for maintenance-free operation over its lifetime.
◆ Freely switchable between entry and exit of rinse modes for automatic rinsing of the reference flow cell.
◆ Utitize a high-precision data acquisition system with sequential rinsing, polarity control, and temperature control.
◆ Imported PD tube ensures high sensitivity.
◆ Equipped with temperature and leak detection alarms for real-time monitoring of instrument status.
◆ Features a touch-sensitive LCD display supporting both local user control and chromatography software workstation modes.
◆ Supports analog and digital signal outputs, compatible with chromatography systems from other brands.

Ultraviolet Detector



◆ Dual-lamp design with a high-transparency deuterium lamp and an optional tungsten lamp, greatly extending the detector's detection range and enabling full-range detection from **188 nm to 900 nm**.
◆ Built-in multi-dimensional wavelength calibration functions (including holmium oxide, potassium dichromate, erbium perchlorate, and deuterium lamp characteristic wavelength calibration) for extremely high wavelength accuracy.
◆ Capabilities include flow-stop spectra scanning, dual-wavelength detection, and wavelength programming.
◆ Supports proportional chromatogram analysis and aids in extended peak purity analysis.

Fluorescence Detector



◆ Dual monochromator structure allows flexible setting of excitation and emission wavelengths, simultaneously monitoring four wavelength channels.
◆ Supports multiple scanning modes including laser spectral scanning, emission spectral scanning, and lamp spectrum scanning.
◆ Provides a stable light source with a direct-current xenon lamp, and multi-level precision detection gain settings for a large dynamic range and high signal-to-noise ratio.
◆ Features a touch-sensitive LCD display supporting both local user control and chromatography software workstation modes.
◆ Supports analog and digital signal outputs, compatible with chromatography systems from other brands.

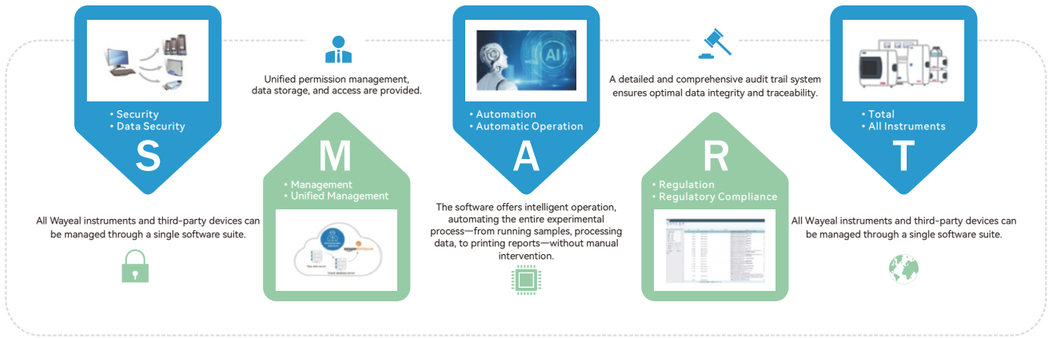
Evaporative Light Scattering Detector



◆ Designed for low-temperature evaporation, offering high sensitivity for thermally unstable and semi-volatile compounds.
◆ Built-in gas mass flow meter with capillary heat transfer differential calorimetry for precise gas flow control. Independent airflow control for nebulization, evaporation, and detection ensures excellent response reproducibility.
◆ Drift tube features corrosion-resistant treatment and stainless steel construction (excluding fragile glass and easily corroded components).
◆ Imported nebulizer and photomultiplier tube ensure high signal sensitivity, long lifespan, and wide adjustable range.
◆ Equipped with temperature, leak, and gas leakage detection alarms for real-time monitoring of instrument status.
◆ Features a touch-sensitive LCD display supporting both local user control and chromatography software workstation modes.
◆ Supports analog and digital signal outputs, compatible with chromatography systems from other brands.

Smart Lab Chromatography Workstation

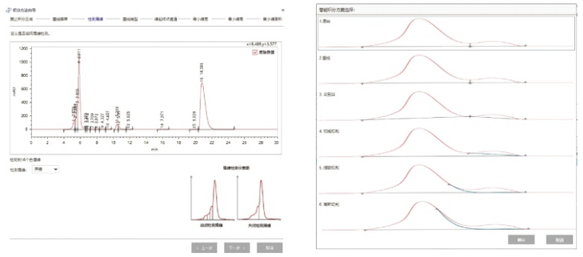
1. Self-devloped CDS with built-in database with proprietary.
2. Validated at CMMI Maturity Level 5, Ensures international quality standards for software development.
3. Featuring a comprehensive audit trail function **compliant with GMP, CGMP, 21 CFRPart 11, ICH guidelines**, and other laws and regulations, ensuring full-process data traceability. Audit trail records are not allowed to be edited and deleted,and can be printed.
4. Convenient data organization and storage capabilities, utilizing an efficient database system to safeguard user data security. Automatic backups and cyclic updates ensure complete backups within the latest 7 days, preventing data loss.
5. Developing the SmartPeak intelligent peak detection function, and employing a second-order algorithm combined with Gaussian, exponential, and tangent skimming to achieve effective identification and intelligent selection of chromatographic peaks (screenshots of shoulder peak recognition and advanced skimming software provided). This simplifies the integration process, providing consistent and reliable peak detection across multiple chromatograms.
6. Modularized device components enable integration with third-party manufacturers. Full control capabilities for multi-brand and multi-model instruments provide ample scalability for future laboratories.



Unique H.B.C-ApexFinder Algorithm System - Efficient, Intelligent, and Compliant:

Introducing the Smart Peak intelligent peak detection feature, powered by a second-order algorithm that simplifies the integration process, providing consistent and reliable peak detection across multiple chromatograms. It can identify shoulder peaks, small peaks, and perform high-order integration simulations, including Gaussian skimming, tangent skimming, and exponential skimming. Combined with valley-to-valley and vertical line manipulation, along with interactive tools for intelligent integration, it offers customers a diverse selection and convenient experience.

A wizard-based approach guides operators in specifying initial chromatographic peak detection parameters. It provides intuitive visual instructions to assist customers in optimizing integration, with real-time display of modification effects. This aligns with a trial-and-error approach, minimizing user input and significantly enhancing the analyst's experience.



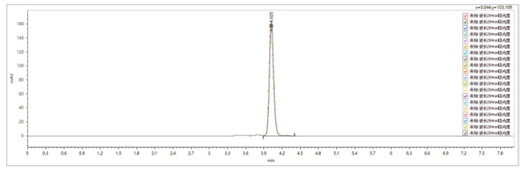
Second-Order Integration Wizard Graph

Intelligent High-Order Integration Graph

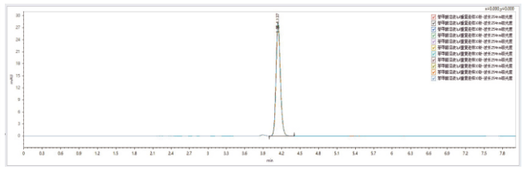
Rsd Testing

Naphthalene Measurement in sample

Routine injection of 5μl (n=20) with a repeatability RSD=0.049% and quantitative repeatability RSD=0.073%.
Small volume injection of 1μl (n=11) with a retention time RSD=0.067% and peak area RSD=0.187%.



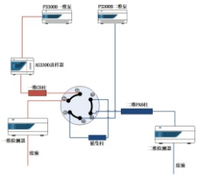
Repetitive chromatograms for 20 consecutive injections of naphthalene sample.



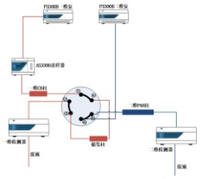
Repetitive chromatograms for 11 injections of small volumes of naphthalene sample.

2D-LC Solutions

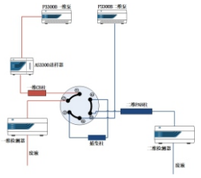
Naphthalene Measurement in sample



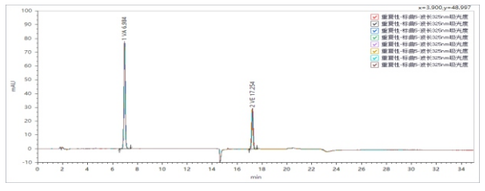
One-dimensional separation stage



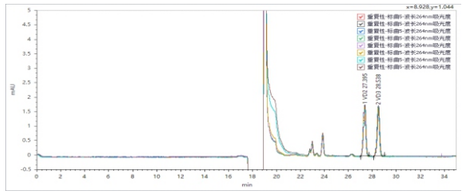
Two-dimensional trapping stage



Two-dimensional separation stage

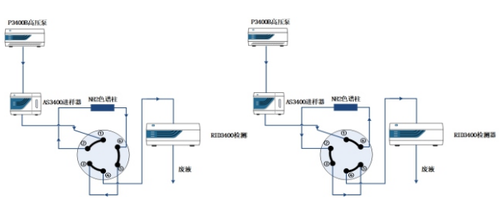


Overlapping chromatograms of one-dimensional detection for Vitamin A and E standards.

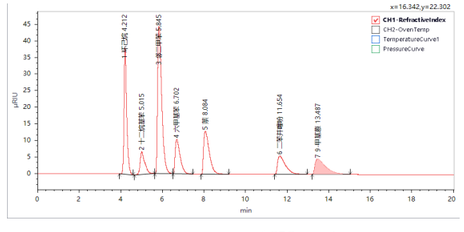


Overlapping chromatograms of two-dimensional detection for Vitamin D2 and D3 standards.

NB/SH/T 0806-2022 Measurement of Aromatics in Petroleum Fractions



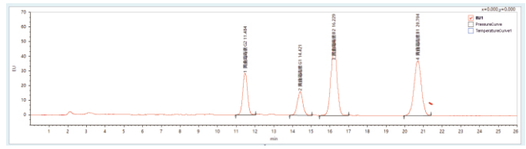
Forward flushing stage　　Reverse flushing stage



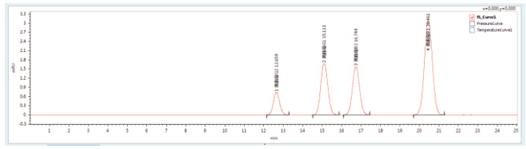
Chromatogram of SPS solution.

Detector Application Testing

Naphthalene Measurement in sample

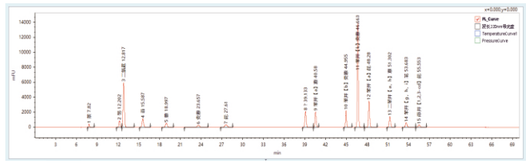


Aflatoxin - Fluorescence - Post-Column Photochemical Derivatization



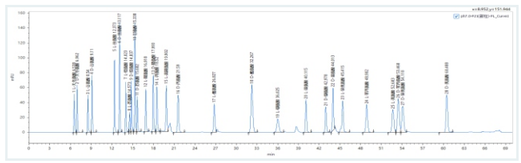
Aflatoxin - Fluorescence - Post-Column Iodine Derivatization

Polycyclic Aromatic Hydrocarbons (PAHs) Testing Applications



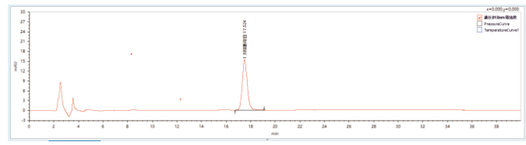
PAHs - Fluorescence

Amino Acid Applications Testing

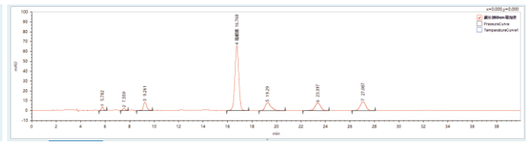


Online Derivatization for 28 Chiral Amino Acids

UV Detector Application Chromatograms

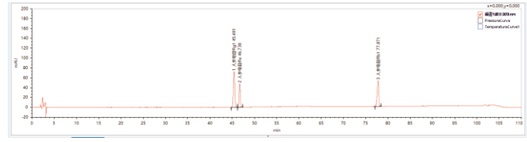


Dipsacus Saponin Testing



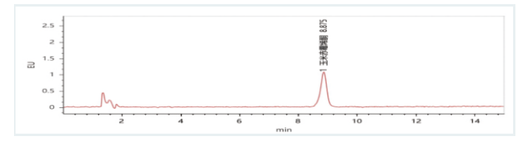
Puerarin Testing

Diode Array Detector Application Chromatograms



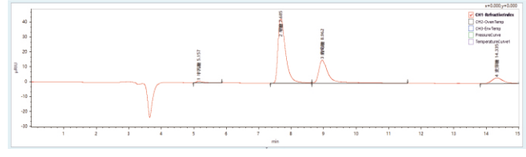
Ginsenoside Testing

Fluorescence Detector Application Chromatograms



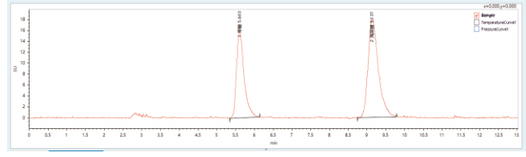
Zearalenone Testing

Refractive Index Detector Application Chromatograms



Polysaccharide Testing

Evaporative Light Scattering Detector Application Chromatograms



Fructose-Type Testing

Autosampler Technical Date

	AS3400	AS3400S
Inject volume range	0.5μL ~ 50.0μL	0.5μL ~ 50.0μL can be extended to 0.5μL ~ 500.0μL
Inject precision	<1.0% RSD（0.5μL ~ 1.9μL） <0.3% RSD（2.0μL ~ 50.0μL）	<1.0% RSD（0.5μL ~ 1.9μL） <0.3% RSD（2.0μL ~ 50.0μL） <0.5% RSD（50.0μL ~ 500.0μL）
Injection volume linearity	R≥0.9999（1.0μL ~ 50μL） R≥0.999（50.0μL ~ 500μL）	
Cross contamination	≤0.002%	
Vials	108 (2*54,2mL sample bottle)	
Maximum delivery pressure	62 Mpa	75 Mpa
Sample refrigeration (optional)	Minimum temperature: 4℃	
Security measures	1. Equipped with a missing sample bottle handling function. When a sample bottle is lost, the user can choose to skip the injection in this bottle or stop the injection; 2. Hard object detection function;	
temperature setting range	4℃~40℃	
Temperature range	Optional refrigeration: room temperature-16℃~-5℃	
Temperature accuracy	±0.5℃	
Vial detection	miss vial	
Needle wash	programmable:wash between injection and wash between vials	
Injection modes	flow to needle	

Pump Technical Date

Series	P3400Q/P3400B		P3400QS / P3400BS	
Flow rate range	0.0000 ~ 12.0000 mL/min		0.0000 ~ 12.0000 mL/min	
Flow rate increment	0.0001 mL/min		0.0001 mL/min	
Maximum delivery pressure	62 Mpa		75 Mpa	
Flow rate setting error	±0.2%（1mL/min）		±0.2%（1mL/min）	
Gradient error	national standard method≤±0.75% protocol method≤±3% (5%~95%，0.2~2.0 mL/min)		national standard method≤±0.75% protocol method≤±3% (5%~95%，0.2~2.0 mL/min)	
Gradient	Quaternary low pressure gradient	Binary high pressure gradient	Quaternary low pressure gradient	Binary high pressure gradient

Column Theromostat Technical Date

	CT3400
Temperature range	4 ~ 90℃
Temperature control range	room temperature-10℃ ~ 70℃
Temperature accuracy	±0.1℃
Temperature stability	0.1℃
Extended function	2-way high-pressure switching valve
Refrigeration function	standard refrigeration function

FLD Technical Date

	FLD3400
Light source	DC Hg-xenon lamp (150W)
wavelength range	200 ~ 650 nm
wavelength accuracy	≤±2nm
Wavelength Repeatability	≤±0.2nm
Signal to Noise （Raman Peak）	Ex：350 nm Em：397 nm (Raman peak ≥3000 S/N 1.5 sec)
Noise	$1x10^{-5}$ FU
Drift	$5x10^{-5}$ FU/h

UV Detector Technical Date

	UV3400	UV3400M
Flow cell	10 μL	10 μL
Wavelength range	188 ~ 900 nm	188 ~ 900 nm
Noise	Single wavelength≤8×10^{-6}AU Multiwavelength≤6×10^{-5}AU （methanol，flow rate I ml/min，C18）	Single wavelength≤8×10^{-6}AU Multiwavelength≤2×10^{-5}AU （methanol，flow rate I ml/min，C18）
Drift	≤1×10^{-4}AU （methanol，flow rate I ml/min，C18）	≤1×10^{-4}AU （methanol，flow rate I ml/min，C18）
Light source	Deuterium lamp (standard), Tungsten lamp (optional)	Deuterium lamp (standard), Tungsten lamp (optional)
Linearity	2.5 Au	2.5 Au
Time constants	0.1, 0.2, 0.5, 1.0, 2.0, 5.0 s	0.1, 0.2, 0.5, 1.0, 2.0, 5.0 s
Wavelength accuracy	≤±1 nm	≤±1 nm
wavelength repeatability	≤±0.1 nm	≤±0.1 nm
Maximum data rate	100Hz(LAN)/12.5 Hz(analog)	100Hz(LAN)/12.5 Hz(analog)
Pixel pitch	6 nm/diode	6 nm/diode

DAD Technical Date

	DAD3400
Flow cell	10 μL
Wavelength range	190 ~ 800 nm
Light source	Deuterium lamp
Detection range	> 2.0Au
Time constants	0.1, 0.2, 0.5, 1.0, 2.0, 5.0 s
Wavelength accuracy	≤±1 nm
wavelength repeatability	≤±0.1 nm
Noise	±30 μAU/h
Drift	≤500 μAu/h
Flow cell pressure limit	≤8MPa
Number of diodes	1024
Pixel pitch	0.6 nm/diode
Detection channels	8
Maximum data rate	100Hz(LAN)/12.5 Hz(analog)

ELSD Technical Date

	ELSD3400
Light source	465nm LED
Detector	photomultiplier tube
Nebulizer setting temperature range	closed，0 ~ 90℃
Evaporator setting temperature range	closed，0 ~ 120℃
Evaporating gas flow range	0.0 ~ 3.00 SLM
Noise	< 0.02mV
Drift	< 0.1 mV/h
Input gas pressure	4 ~ 6 bar
Eluate flow range	0.2 ~ 5.0 mL/min
Data rate	10、20、50、100SPS（Hz）
Time constants	No filtering; 0.01s; 0.02s; 0.05s; 0.1s; 0.2s; 0.5s; 1.0s; 2.0s; 5.0s; 10s

RID Technical Date

	RID3400
Type of flow cell	2
Refractive index range	1.00~1.75RIU
Detection range	±600 μRIU
Drift	±250 nRIU/h
Noise	±2.5 nRIU
Flow rates	≤10 mL/min
Flow cell	5 bar
Temperature control	OFF, 30 ~ 65℃(1℃ each time);
Wetted materials	Stainless steel/ fused silica / PTFE /PEEK