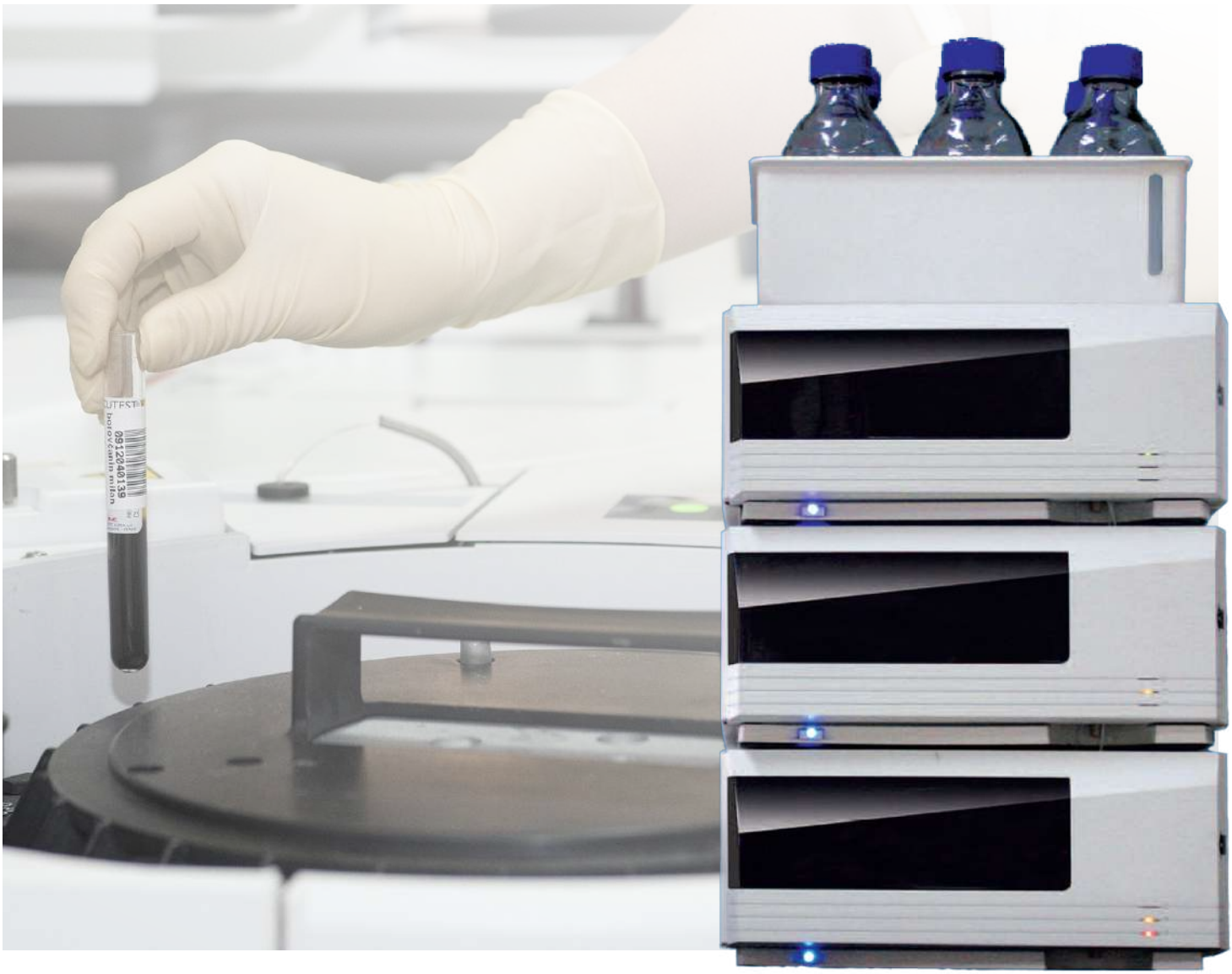
HPLC-6

High Performance Liquid Chromatography
Complete Manual Injection Gradient System



HPLC-6 - High Performance Liquid Chromatography - Complete Manual Injection Gradient System

The HPLC-6 Complete Manual Injection Gradient System offers power data processing with unquestionable accuracy and precision.

The **HPLC-6** Chromatography system gives excellent reliability and stability with accurate flow rate. Comes with easy to use LCW software offers complete control, powerful data processing, reporting functions, intelligent diagnostic systems and maintenance utility ensure a complete and flexible software solution for your analytical work.

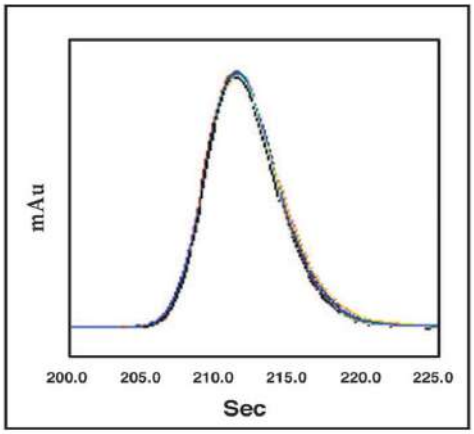
Character – Powerful Accuracy and Stability

- "Accuracy is the spirit of analysis." Based on a well structured design and manufacturing process, unquestionable accuracy and precision were a prerequisite, secondly quantification and precision of analysis were dependent on accurate flow rate.
- Excellent reliability and stability. The pump heads have been machined using a first class CNC process; the innovative structural design has been designed to achieve minimum pressure fluctuation. Consequently stable flow, low noise and overall quality provide the foundation for reliable results.
- LCW software offers complete control, powerful data processing, reporting functions, intelligent diagnostic systems and maintenance utility ensure a complete and flexible software solution for your analytical work.
- Art combined with practicality. The modular system provides shape and character whilst being aesthetically pleasing. The unique and practical design ensures ease of use and maintenance. In essence, the combination of art and practicality complement each other.
- The HPLC-6 is a high performance yet cost effective solution. The modular design ensures that you can configure the system to meet your application requirements. A dedicated team of product specialist will provide technical support and provide an application development service.
- The quotation that you would receive for HPLC-6 is for a Basic HPLC System. For each special parameter test, please refer to optional parts pricelist and inform us to add that parts to your quotation.

Configuration

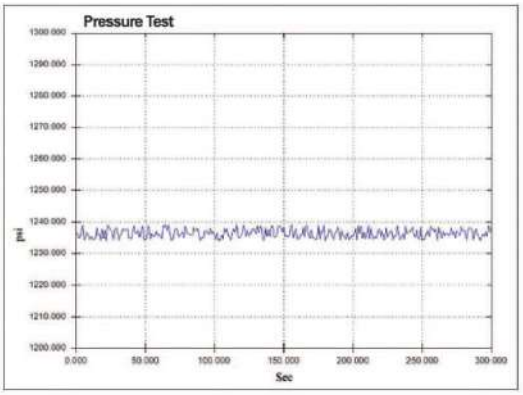
HPLC-6 Gradient Configuration

PUMP P-21

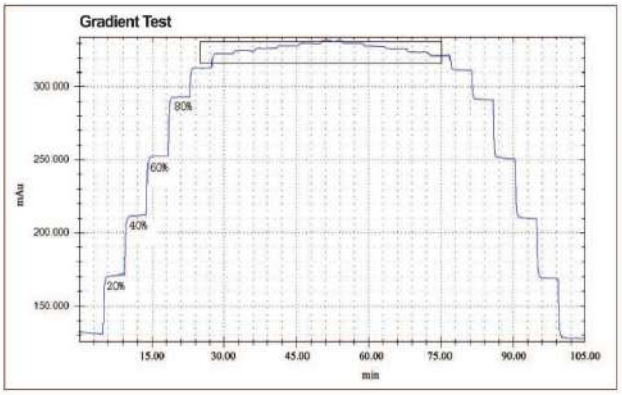


Item	Retention Time(s)	Area (μAbs.s)
1	211.5	354986.7
2	211.9	355102.1
3	212.2	353989.3
4	212.6	357527.6
5	212.0	357115.9
6	210.1	356984.3
7	211.8	360583.8
8	211.3	359729.9
9	211.6	357272.6
10	210.6	352621.6
Average	211.6	356591.4
RSD%	0.35	0.69

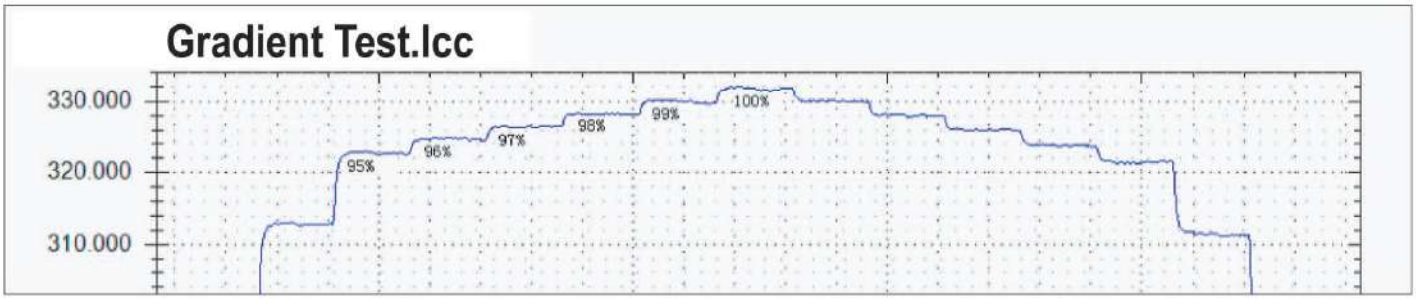
The figure above shows comparison of 10 injections (Response time 0.1s). From this figure we can see that the Pump P-21 exhibits good repeatability on both retention time and peak area, which leads to accurate results. The solvent system incorporates a fluid design that uses a serial flow path. The system employs dual plungers and two check valves for enhanced reliability. The dual com gear is calculated to ensure optimal flow control whilst an integral seal wash system will extend the serviceable life of the pistons and seals.



Optimized solvent delivery is achieved using pulse dampening compensation. This system optimizes pump stability and decreases pressure ripple to 1%.



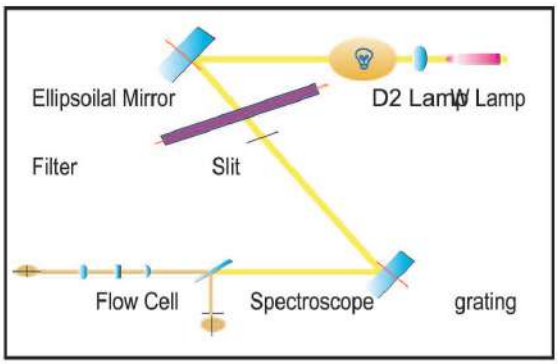
Accurate gradient elution: composition accuracy <2%.



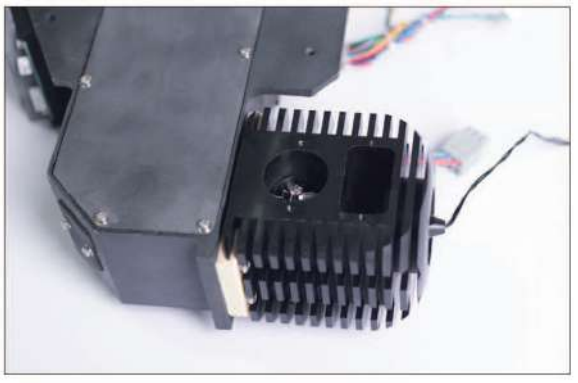
Minor change composition down to 1% can be distinctly observed.

DETECTORS

Detector 1

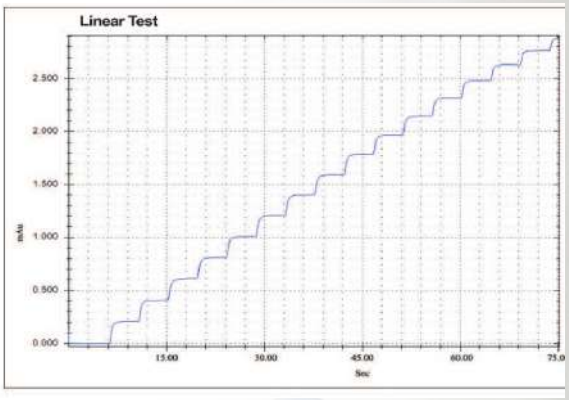


Simplified optics: comprising of an advanced ellipsoidal mirror and concave grating. Compared with traditional configuration, this arrangement greatly reduces the number of optical components ensuring wavelength accuracy.

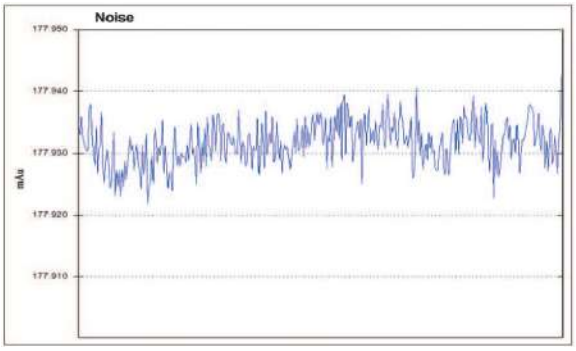


Transmission deuterium lamp combined with tugsten lamp provides a wavelength range of 190-800nm. The shine through deuterium lamp eliminates moving components, reduces noise whilst offering increase reliability.

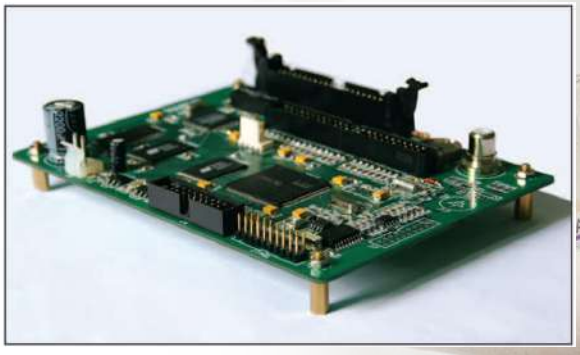
The lowest baseline noise <0.75x10-5Au allow sensitive analysis to be achieved. The thermostatic flow cell reduces the influence of room temperature and fluctuations on absorbance and provides a stable baseline.



Linearity range >104.



Low noise and drift noise < 0.75x10Au (25, 234 nm, dry cell, response time 1s)
Drift < 10-4 Au/h (25, 254nm, dry cell response time 1s)



Integral large capacity memory, which can save the data in the event of accidental power shortage.

Detector 2

The Detector 2 is a modern programmable Diode Array Spectrophotometer for HLPC. The instrument includes adeuterium lamp and detector head with 256 diodes that can monitor the wavelength range from 190 to 500nm with a user-selectable bandwidth from 4-25nm.

Calibration and wavelength validation are performed using an integrated holmium oxide filter. The system is designed for ease of operation and provides optimum performance with high sensitivity in a very compact design.

Detector 3

The Detector 3 Chromachem is used to detect all semi- and non-volatile analyses in your sample, including those transparent to other detectors.

Detector 4

The Detector 4 is a versatile and high sensitive RI detector that can be used with various manufacturers 'HPLC System'.

Detector 5

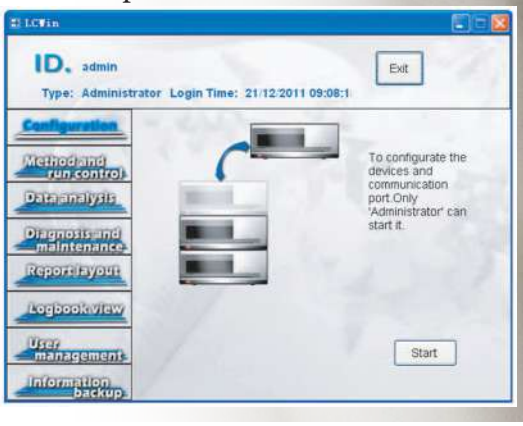
The Detector 5 fluorescence detector can offer world-class sensitivity, excellent ease of maintenance, and validation support functions. They support wide range of applications from conventional analysis to high-performance analysis.

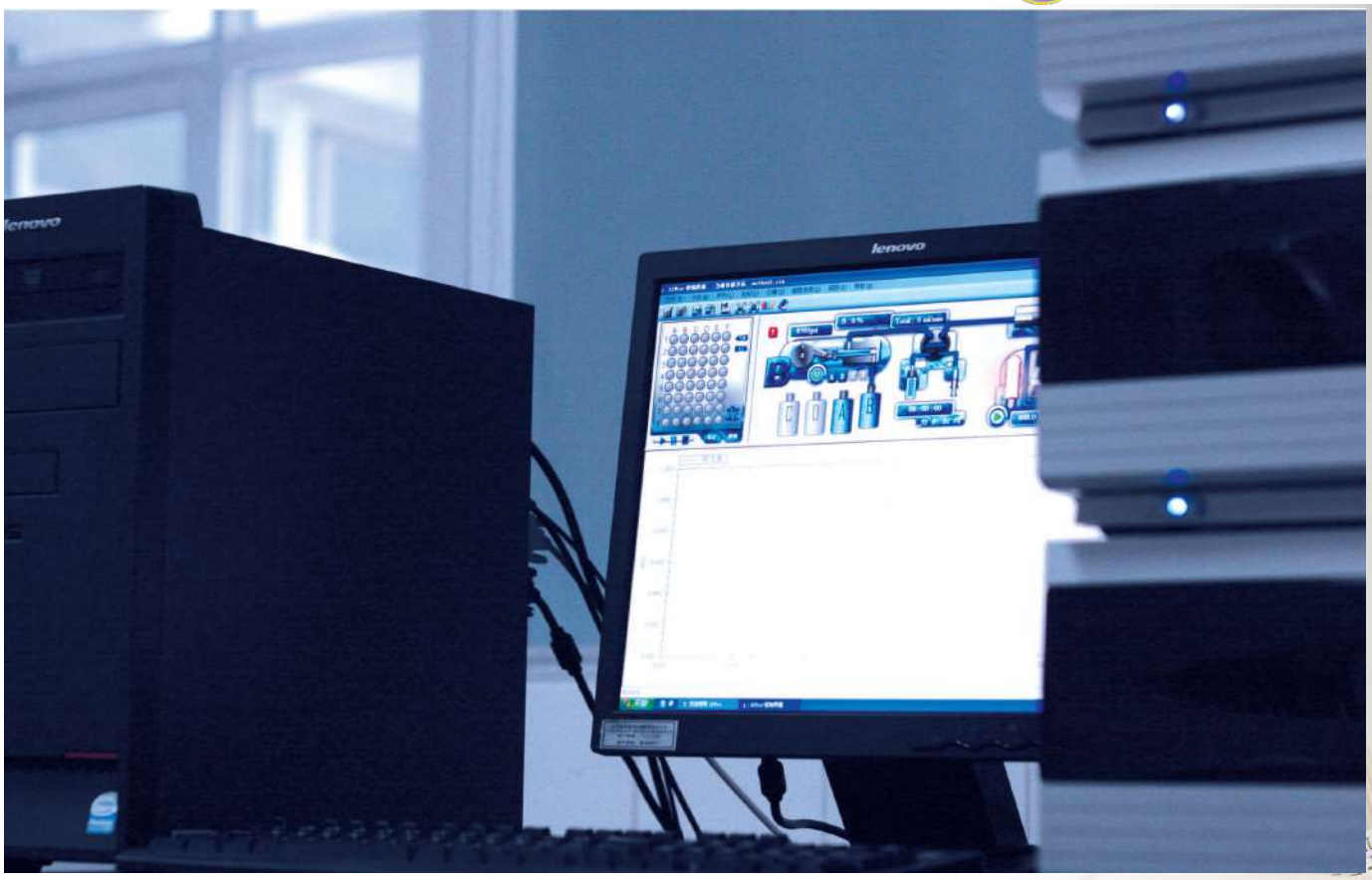
Control Software

LCWin is a liquid chromatography software package developed by Labomed Inc. It provides complete instrument control and data processing functions with a simple and efficient operation.

Function areas

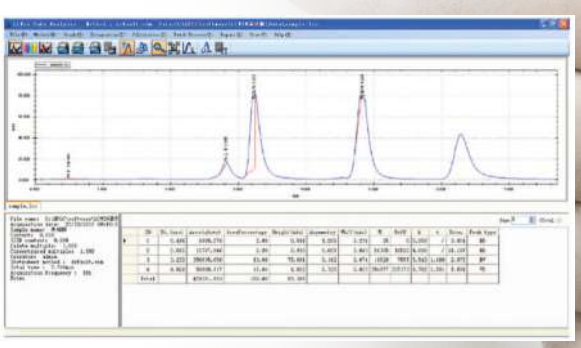
Instrument control, data analysis, diagnostics, report editing. These four modules provide comprehensive functionality. The modern layout provides a convenient and simple user interface whilst wizard operations simplify configuration and operation.

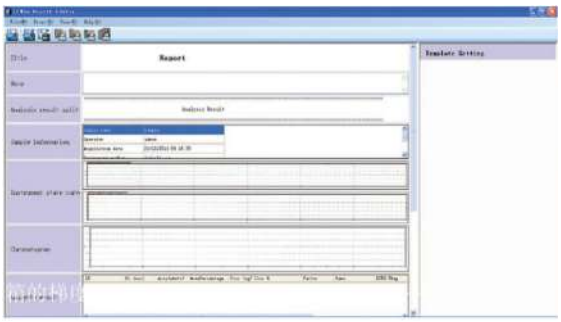




Functional approach

Powerful data processing functions, intelligent batch processing and report capabilities provide the users with multiple operations and reporting formats. All six quantitative functions include programmable integral parameters and over 20 chromatographic parameters to satisfy all your demands for analysis and calculation.





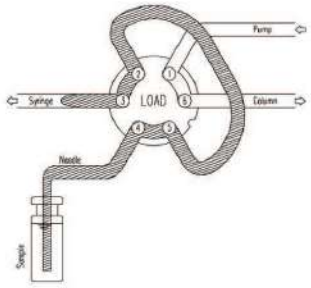
Programmable report components with report manager

Flexible reporting, 12 editable components provides complete control over the reporting styles.

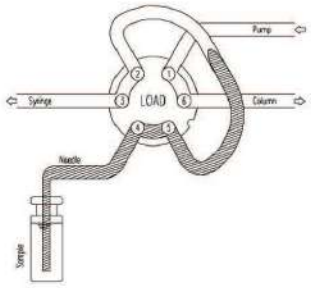
Auto Sampler 6

The high performance Auto Sampler delivers superior repeatability (<0.3% full loop mode). This fully automated solution precisely measure sample volume with no sample loss and has impressive high speed 17 seconds injection cycle.

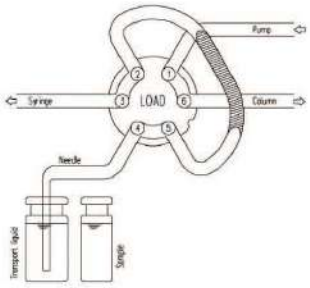
Flexible injection modes:



Full loop mode
(Most accurate)



Partial loopfill mode
(More flexible)



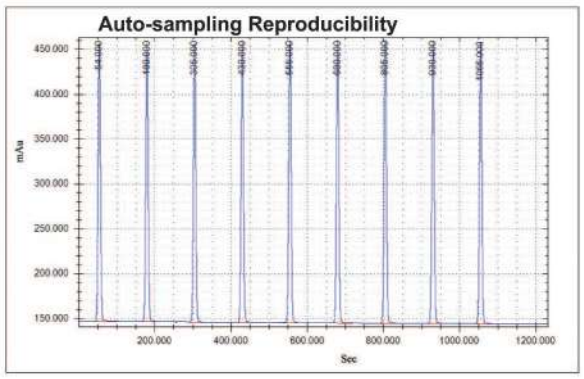
uL pickup mode
(Minimal sample loss)

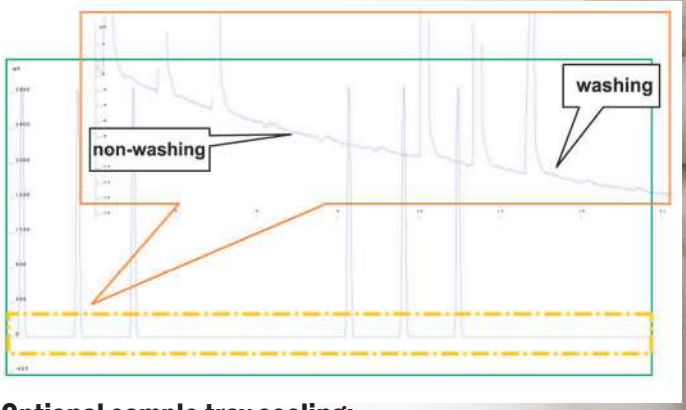
Extra injection range:
1-500µl

Ultra high reproducability:

Full loop <0.35 %
Partial loopfill <0.5 %
uL pickup

Sample carry over
The special design of the needle wash station and rapid wash solvent delivery enable efficient removal of contaminants. Extensive wash routines ensure minimal carry over even for high absorptive compounds.





Ultra fast sampling cycle:
Minimum sampling cycle of 17 seconds, greatly improves throughput time.

Optional sample tray cooling:
With build in peltier cooling, temperature can be reduced to 4˚C.

Auto Sampler Main Components

① Syringe location module
② Cooling module
③ Syringe driver module
④ Injection valve
⑤ Sample tray module
⑥ CPU board

Application

HLPC analysis usually applied to different polarity in volatile or thermo stable organic compounds, also a variety of bioactive substances and natural products; synthetic and natural polymers amongst many. Today, 80% of the organic compounds can use liquid chromatography for analysis and detection.

- **Medical and pharmaceuticals**

Drug analysis for pharmacy, detection of effective components, drugs metabolic control, micro toxin in-vivo analysis, and microbial drug analysis.

- **Health and epidemic prevention**

Clinical analysis, research of disease control, micro analysis in biological areas, human biological analysis, and metabolite analysis.

- **Environmental monitoring**

Water, air, rainfall monitoring and determination of the content of various pollutants.

- **Agriculture, forestry, fisheries, animal husbandry**

Pesticide residue detection, crop detection, chemical fertilizer detection, plant quarantine, veterinary drug detection, aquamarine detection.

- **Manufacturing**

Process control and product testing, such as analysis of food preservatives, sweeteners, spices, food enzyme, carbohydrate, vitamins, nutrients, cosmetics preservatives and antimicrobial agent detection.

- **Petrochemical**

Industrial process control, product testing and manufacturing process.

- **Quality control**

Quality control of commodity inspection, quality inspection, import/export quarantine departments.

- **Education and scientific research**

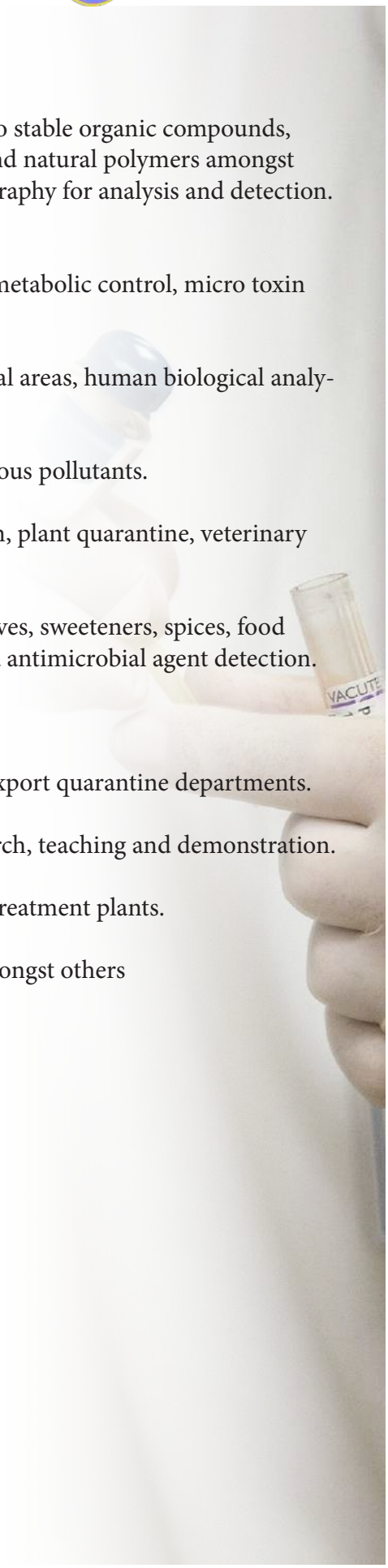
Educational establishments, institution for experiment, scientific research, teaching and demonstration.

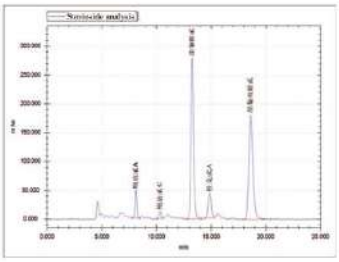
- **Water conservation system**

Water quality and environmental monitoring, fresh water and sewage treatment plants.

- **Other areas**

Power station, military, judicial, public security detection, forensics amongst others





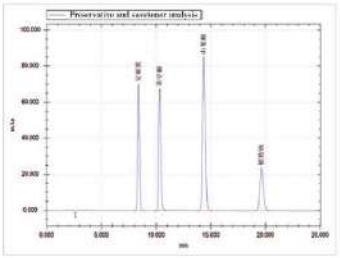
- Stevioside analysis

Column: pGrandsil NH2, 5um, 4.6 × 250mm

Mobile phase: Acetonitrile:water=80:20

Wavelength: 210nm

Flow rate: 1.2mL/min



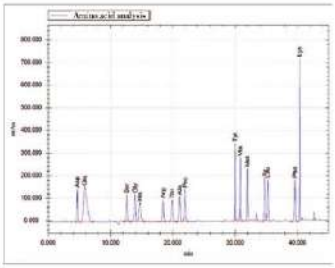
- Preservative and sweetener analysis

Column: pGrandsil-STC, 5um, 4.6 × 250mm

Mobile phase: 0.02M ammonium acetate:methanol=80:20

Wavelength: 230nm

Flow rate: 1mL/min



- Amino acid analysis

Column: pGrandsil-AA C18,, 5um, 4.6 × 250mm

Mobile phase: A: 0.1M sodium acetate(pH=6.5):acetonitrile=80:20

B: acetonitrile:water=80:20

Gradient elute

Wavelength: 254nm

Flow rate: 1mL/min

Column temperature: 40℃

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Specification

Pump P-21

Item	Specification
Flow range	0.001mL/min~10.000mL/min, 0.001mL/min increment
Compressive compensation	User–defined
Plunge seal wash	Manual
Maximum operation pressure	40MPa, upper and lower limits settable, automatic alarm
Pressure ripple	≤1%（1mL/min，water）
Flow precision	≤0.075% RSD（based on retention time）
Flow accuracy	± 1%
Binary high pressure gradient accuracy	≤1%
Binary high pressure gradient precision	≤0.2%

DETECTOR 1

Item	Specification
Lamp source	Deuterium lamp, Tungsten lamp
Wavelength range	190–800nm
Spectral bandwidth	6nm
Wavelength accuracy	± 1nm（Deuterium lamp）
Wavelength precision	≤0.2nm（Deuterium lamp）
Linear range	$\geq 10^4$
Noise	$\pm 0.75 \times 10^{-5}$ AU（dry cell, 254nm, integration time 1s）
Drift	$\leq 1 \times 10^{-4}$ AU/h(dry cell, 254nm, integration time 1s)
Minimum detection concentration	$\leq 5 \times 10^{-9}$g/mL (Naphthalene/Methanol solution)
Flow cell volume	10μL
Flow cell pressure limit	10MPa(1500psi)
Integration time	0.1s–2s

Auto Sampler 6

Item	Specification
Loop range	1–5000 μL, 1 μL increment (10mL loop optional)
Syringe volume	500 μL(2500 μL optional)
Sample capacity	2 × 48 vial tray (1.5ml vial); (optional 12 positions 10mL vial tray, 96 well plate formats, 384 well plate formats)
Switching time of injection valve	< 100ms
Needle location precision	≤0.6mm
Injection cycle time	17s(60s if including washing needle)
Injection modes	Full loop, partial loop fill and pickup mode
Injection reproducibility	Full loop < 0.3% Partial loop < 0.5% Pickup mode < 1%
Carry over	< 0.05%
Cooling (optional)	4℃ to ambient –3℃

Column Oven

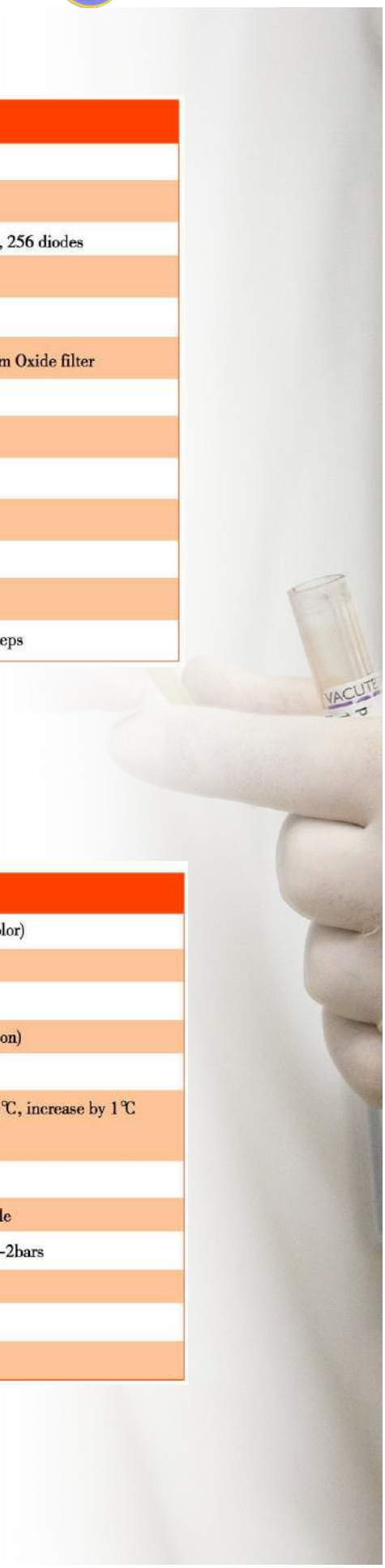
Item	Specification
Model	LC240 and LC242 LC241 and LC243
Temperature range	Ambient–100℃, 0.1℃ increment
Temperature accuracy	± 0.5℃
Temperature stability	≤0.1℃
Cooling(optional)	Minimum to ambient –15℃
Columns accommodated	3 Columns, 15–25cm

Degasser

Item	Specifications
Type	LC250 Membrane online degasser 2 channel
	LC251 Membrane online degasser 3 channel
	LC252 Membrane online degasser 4 channel
Volume	10ml/min

Detector 2

Item	Specifications
Light Source	Deuterium
Measurement Range	190–500nm
Detection Type	Diode Array, 1.25nm dot pitch, 256 diodes
Bandwidth	4–25nm, user selectable
Wavelength Accuracy	≤1nm
Wavelength Validation	Automatic via internal Holmium Oxide filter
Noise(a)	$\leq 1 \times 10^{-5}$ AU
Drift(a)	$\leq 5 \times 10^{-5}$ AU/hr
Linearity	0–1.5AU
Measurement Range	0–2.2AU
Spectra	4 spectra can be stored
Integration time Range	13–200 ms
Time Constants	0.1 sec to 10.0 sec in 1–2–5 steps



Detector 3

Item	Specifications
Light Source	High intensity halogen lamp (multicolor)
Detector	Photomultiplier (High sensitivity)
Analogue Signal Output	0–1V
Detect Limit	< 10ng glucose (Non–column injection)
Heating Time	< 10min heat up to 150℃
Temperature Range	Evaporation chamber: maximum 150℃, increase by 1℃ Nebulizer: Maximum 70℃
Autozero	Front panel or external trigger
Nebulizer Type	Venturi tube, temperature controllable
Gas Flow Rate	1–2L/min, recommended pressure 1–2bars
Spectra	4 spectra can be stored
Integration time Range	13–200 ms
Time Constants	0.1 sec to 10.0 sec in 1–2–5 steps

Detector 4

Item	Specifications
Refractive Index Range	1.00~1.75
Detection Range	0.25~512 μ RIU
Linear Range	≥600 μ RIU
Noise	≤2.5nRIU（pure water, response time: 1.5 sec）
Response Time	0.1，0.25，0.5，1，1.5，2，3，6 sec
Autozero	Automatic zero
Autozero Range	Full range
Deviation Adjustable Range	10 μ RIU
Deviation Resolution	50 μ RIU
Detection Cell Volume	8 μ L
Flow Rate	Common value 0.2~3.0ml/min，maximum10mL/min（pure water）
Highest Pressure	0.05MPa
Dead Volume	670ul
Temperature Control	Off, 30~50℃（each time 1℃）、77℃ fuse（dual temperature control）

Detector 5

	RF-20A	RF-20Axs
Light Source	Xenon Lamp	Xenon Lamp Low pressure Mecury(For wavelength accuracy correction)
Wavelength Range	200nm-650nm	200nm-750nm
Spectral Bandwidth	20nm	
Wavelength Accuracy	± 2nm	
S/N	Raman peak of water S/N above 1200	Raman peak of water S/N above 2000
Detection Cell Temperature Range	4℃-40℃, 1℃ increment	
Detection Cell Temperature Control Range	(ambient-10)℃-40℃	
Detection Cell	Standard detection cell: volume:12 μ L，withstanding pressure:2MPa Half-micro detection cell: volume:12 μ L，withstanding pressure:2MPa	
Functions	Simultaneous double-wavelength test, wavelength scanning	
Safety Protection	Leakage sensor	
Operation Temperature Range	4℃-35℃	

Accessories