Aqua 800

High Performance
Liquid Chromatograph

HPLC

GBC

ISO 9001
Quality Accreditation

GBC has always placed a strong emphasis on quality in all aspects of our operation, from design and manufacture to the provision of service and support to our customers, and we are fully committed to continuous evaluation and improvement in all areas.

The GBC Quality Management System has been accredited to the ISO 9001 quality standard by Lloyd's Register Quality Assurance Limited. This certification is your assurance that the procedures and processes used to produce the goods and services which GBC provides comply with the relevant International Standard, and demonstrates commitment to meeting the needs and expectations of our customers.

Since 1978 GBC has been at the forefront of scientific technological development, manufacturing and marketing a wide range of award winning, quality scientific instruments.

GBC's Product Lines

Visionary Technology

GBC Scientific Equipment will advance people's knowledge and their capacity to enhance the quality of life for all humankind.

GBC

Aqua 800
High Performance
Liquid Chromatograph

Instrument Features

- Microcomputer controlled wavelength selection, temperature control, semiconductor refrigeration column oven.
- Building block modular design: standing vertical column oven design allows convenient column installation.
- Allow quick switching between analytical LC and semipreparative LC.
- Connectable to post-column derivatization tool, compatibility with various detectors.
- The system can be selected from isostatic system, binary high-pressure system, or tetra-low-pressure system, with the latter featuring an integrated vacuum degassing device.
- Each module has the function of leakage alarm.

High Performance Variable Wavelength UV-Visible Detector

- Patented differential refractive index technology, ensures very low noise and drift.
- 20mm super light pathlength detection cell, enables high detection sensitivity.
- New optical design, concave holographic grating, high stability.
- Multi-wavelength 10-segment time program, full band pump-stop scanning, allows accurate selection of the best detection wavelength.
- Direct digital-to-analog conversion, RS232 interface output, RS485 communication protocol for control interface.
- Long lifespan D2 lamp, working for more than 2000 hours.
- The switch of the deuterium lamp can be set to extend the service time of the light source.

Features

High Performance Liquid Chromatograph

High precision vertical standing isothermal column oven

- Can accommodate any 2 analytical columns (15cm, 25cm, 30cm), compatible with semipreparative column.
- Advanced semiconductor refrigeration temperature control, suits low temperature separation of biological samples and samples susceptible to higher temperature degradation.
- Column installation and replacement is user-friendly, with respect to semipreparative column installation.

High pressure infusion pump

- A double-plunger reciprocating high-pressure pump with large stroke, featuring high precision and wide flow range.
- The software program controls the gradient elution of the two pumps.
- The integrated check valve, the plunger rod and the sealing ring are easy to replace.
- Automatic cleaning of plunger rod.
- Automatic exhaust function.

Chromatographic workstation

- Convenient and intuitive remote control function for easy operation of pumps, detectors, and column ovens.
- Powerful data processing capability supporting various quantitative algorithms.
- Powerful chromatogram comparison function.
- Records raw chromatographic data and related information in compliance with GLP standards.
- Customizable report output format.
- Software features include: Import and export of chromatographic data. Project group classification and editing functions. Real-time pressure monitoring with saved curve data and maximum pressure alert functionality. Audit version supports multi-user online mode.
- Raw data can be exported with multiple data formats available.

Technical Specifications

High-pressure infusion pump specifications	
Operating Pressure	0-42MPa
Flow Rate Range	0.001-50.000 mL/min, Semi-Prep Compatible
Flow Rate Accuracy	RSD < 0.07%
Gradient Range	Isocratic, Binary Gradient, Quaternary Low-Pressure Gradient
Gradient Accuracy	±2%
Pump Flow Setting Error	±0.2%
Flow Setting Error	±0.5%
Flow Stability Error	≤0.5%

Column Oven Specifications	
Temperature Control Range	Semiconductor Cooling 5℃~80℃
Temperature Setting Error	±0.5℃
Temperature Stability	≤0.2℃/h
Column Oven Capacity	Can accommodate two analytical columns, or one semi-preparative column
Dimensions (L×W×H)	410×170×480 (mm)

UV-Vis Detector	
Light source	Switchable with Settable On/Off
Wavelength range	190nm~700nm
Spectral bandwidth	5nm
Wavelength indication error	±0.5nm
Wavelength accuracy	≤0.2nm
Wavelength scanning	Multi-wavelength programming (10 wavelength ranges)
Range of linearity	$> 10^4$
Noise	$<2\times10^{-5}$ AU
Drift	$< 2.0\times10^{-4}$ AU /30min
Cell width	20mm
Minimum detectable concentration	1×10^{-9} g/mL (naphthalene)

QP-104 Quaternary Pump

Technical Parameters

- Liquid Delivery Principle: Dual plunger parallel reciprocating pump with automatic pulse suppression system.
- Maximum Output Pressure: 42MPa.
- Pump Flow Rate Setting Error: ±0.5%.
- Flow Stability Error: ≤±0.5%.
- Flow Range: 0.001mL/min ~ 15.000mL/min, up to 50mL/min, compatible with semi-preparative liquid chromatography.
- Dimensions (Length × Width × Height /mm): 300×586×175.

Instrument Features

- Equipped with quaternary proportioning valve, featuring short opening time, precise proportioning, and consistent response across all channels.
- Employs asymmetric composite distribution method to achieve accurate proportioning under different flow rates.
- Four-channel arbitrary switching to meet the needs of diversified mobile phase research in liquid chromatography analysis methods, reducing the need for multiple mobile phase replacements.
- Real-time display of each channel's flow status for convenient monitoring of instrument operation.
- Built-in four-channel vacuum degasser, online plunger cleaning device, and gradient curves support over 30 entries.
- Wetted materials: SUS 316, PEEK, fluororesin.
- Plunger rod online automatic cleaning function.

EL-100

Evaporation Light Scattering Detector

- Appearance Structure: A concise and compact modern design. The front panel features an LCD display showing the instrument's real-time status, and the detector can be controlled via front panel buttons or workstation software.
- High-Efficiency Nebulizer: A gas-liquid separation dual-orifice quartz nebulizer. Without self-enhancement effect, the high-pressure constant flow pump delivers the mobile phase, ensuring a stable mist. The nebulizer front end is equipped with a collision ball to improve nebulization efficiency. The small aperture at the carrier gas outlet significantly reduces gas consumption. It is easy to install and less prone to blockage.
- Low-Temperature Evaporation Drift Tube: The heating layer is tightly attached to the drift tube for faster heating. Precise temperature sensors and sensitive over-temperature protection devices ensure high evaporation efficiency.
- Stable LED Light Source: An LED is used as the incident light source, powered by an adjustable constant current power supply, resulting in more stable light intensity. This reduces the instrument's baseline noise and drift, improving detection accuracy.
- PMT Detection Cell: A side-window photomultiplier tube (PMT) with high amplification is used as the signal collection device. Optical lenses and apertures are installed at the front end to shield interference from stray light, ensuring more accurate detection.
- Compatibility: It can perfectly match the Aqua 800 HPLC system and can also be integrated with HPLC systems from other manufacturers.

EL-100 major technical specifications

Evaporation Zone Temperature Range	Room Temperature ~ 110℃
Temperature Control Accuracy	±0.5℃
Temperature Control Increment	1℃
Gas Input Pressure	0.2-0.5MPa
Gas Requirements	Dry and Clean Nitrogen or Air
Solvent Flow Rate	10μL/min ~ 3 mL/min
Gas Flow Rate	300mL/min ~ 1.5 L/min
Light Source	450nm Blue LED
Detection Element	Photomultiplier Tube
Minimum Detection Concentration	≤2.5μg/mL (Cholesterol/Methanol) < 1ng (Glucose, Direct Injection)
Noise level	<0.1 mV (1mL/min)
Instrument dimensions	Length width height：580×170×480

EL-100 Evaporative light scattering detector

Baseline and noise of EL-100 evaporative light scattering detector

Column：C18，5 μm，150×4.6 mm　　Column temperature：25℃
Mobile phase：methanol: water (9+1) solvent　　Flow rate：1 mL/min
Evaporation temperature：40℃　　Carrier gas flow rate：700 mL/min

Diagram 1. Baseline noise and baseline drift test

Detection limit of cholesterol by EL-100 evaporative light scattering detector

Column：C18，5 μm，150×4.6 mm　　Column temp：25℃
Mobile phase：Methanol(HPLC grade)　　Flow rate：1 mL/min
Carrier gas type：N_2　　Carrier gas flow rate：700 mL/min
Evaporation temp：35℃　　Sample：5 μg/mL Cholesterol methanol solution

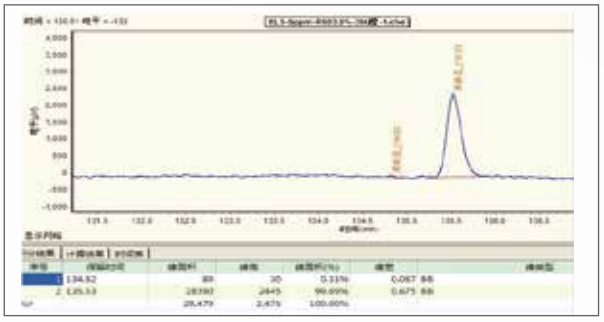

Diagram 2. Chromatogram of 5 μg/mL cholesterol methanol solution

As shown in Diagram 1, baseline noise ＜100 μV, baseline drift ＜200 μV/30 min.
According to calculation method of minimum detection concentration, the minimum detection concentration of cholesterol is 0.12 μg / mL as calculated based on the data in Diagram 2. National Measurement and Verification Procedure stipulates that baseline noise ≤1 mV, baseline drift ≤5 mV /30 min, quantitative repeatability ≤4.0%, and minimum cholesterol detection concentration ≤5 μg / mL.

Aqua 800 System

PCRM-120 Post Column Reaction Module features

- Easy connection to LC.
- Modular design, number of derivatization pump is configurable, and derivatization pump can be used as a LC infusion pump.
- Temperature controller and derivatization device adopt standing integrated structure, noiseless and high precision.
- Sealed system, high pressure resistance.
- Built-in high-efficiency pulse damper, low pressure pulse.
- Specially designed mixer, ensures full mixing of derivatization reagent with target substance, for complete derivatization.
- LCD screen displays pressure and system flow rate, can set flow rate and pressure directly on control panel.
- Derivatization pump equipped with automatic over-pressure shut down function.

PCRM-120 Post Column Reaction Module

PCRM-120 Post Column Reaction Module	
Temperature Range	Room temp +5℃-120℃
Set Precision	0.1℃
Overall Temperature Accuracy	≤0.5℃
Overall Temperature Repeatability	±0.5℃
Derivatization Tube Volume	Derivatization tube with different volume can be selected

Derivatization pump	
Working Pressure	0-42 Mpa
Flow Range	0.001-15.0 mL/min
Flow Accuracy	RSD<0.1%
Pump Flow Setpoint Error	±0.2%
Flow Setpoint Error	±0.5%
Flow Stability Error	≤0.5%

AS-405 automatic sample introduction system

AS-405 Main Technical Parameters	
Injection Mode	X-Y-Z operation mode
Repeat Injection	1–99 repeat injections per sample vial
Repeatability	Relative Standard Deviation (RSD) of typical peak area < 0.5% (starting from 3μL injection volume)
Sample Syringe Size	500 μL syringe
Cleaning Cycles	1–9 user selectable wash cycles, ensuring cross contamination < 0.02%
Cleaning Volume	0–400 μL wash volume
Sample Capacity	120 positions (1.8 mL sample vials)
Control System	32 bit embedded microprocessor with ARM7 core
Communication Interface	RS232/485 communication interfaces
Environmental Conditions	Operating temperature: 5℃–40℃, relative humidity: 20%–80%

AS-405 automatic sample introduction system

DM-100/DM-101 Online Degasser

Applications

It is suitable for various models of high-performance liquid chromatographs and can be connected between the solvent reservoir and the infusion pump.

Features

High degassing efficiency, smooth baseline, no drift, and low noise.

Basic Configuration

Single-channel, three-channel or four-channel degassing systems are available.

Degasser is available in a horizontal or vertical orientation according to customer requirements.

DM-100/DM-101 Online Degasser

Application Case

Determination of Astragaloside IV by EL-100

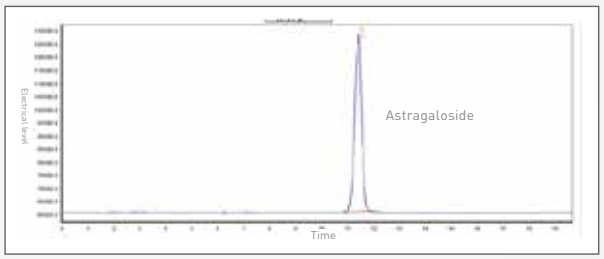

Diagram 1. Chromatogram for analysis of 250 ppm Astragaloside standard sample

Column: Inertsil C18 4.6×250 mm
Mobile phase: 35% ACN
Flow rate: 1 mL/min Injection volume: 20 μL
Drift tube temperature: 70℃ Gas flow rate: 900 mL/mim

EL-100 Determination of oleanolic acid, ursolic acid

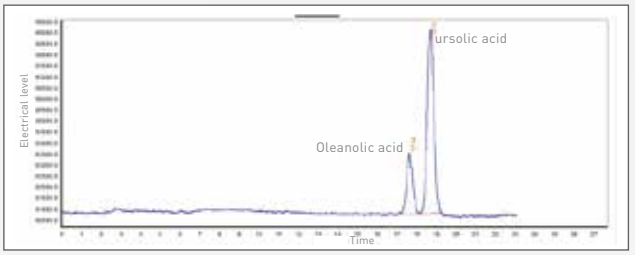

Diagram 2. Chromatogram for analysis of 50 ppm oleanolic acid and 100 ppm ursolic acid standard sample

Column: Inertsil C18 4.6×250 mm
Mobile phase: methanol-0.2% acetic acid (88:12)
Flow rate: 1 mL/min Injection volume: 20 μL
Drift tube temperature: 60℃ Gas flow rate: 900 mL/mim

EL-100 Determination of Ginkgo Leaf Extract

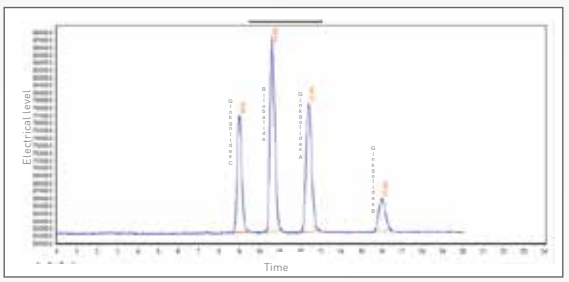

Diagram 3. Chromatogram for analysis of Ginkgo leaf extract

Mobile phase: Methanol-Tetrahydrofuran-Water (25:10:65)
Column: Inertsil C18 4.6×250 mm
Sample:
Ginkgolides A 236 ppm Ginkgolides B 92 ppm
Ginkgolides C 176 ppm Bilobalide 252 ppm
Drift tube temperature: 65℃ Gas flow rate: 900 mL/mim

Determination of polycyclic aromatic hydrocarbons by UV detector

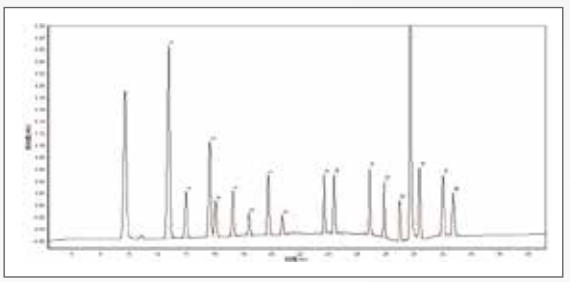

Diagram 4. Chromatogram for analysis of 16 polycyclic aromatic hydrocarbons standard sample (3μg/mL)

Column: Inertsil C18 4.6×250 mm
Mobile phase: Acetonitrile and Water (gradient elution)
UV detector: multiband time programming

Ordering Information

Each Aqua 800 HPLC system is supplied with UV-Vis detector, 6-way valve, quadruple pump, vertical column oven, precolumn, C18 column and software.

01-5012-01	**Aqua 800 HPLC System**
	Accessories
99-0801-00	EL-100 evaporative light scattering detector
99-0802-00	DM-101 online degassing unit
99-0803-00	AS-5150A ultrasonic cleaner
99-0804-00	AS-405 automatic sampler, capacity: 120 positions
99-0112-00	PCRM-120 post-column derivative device (single flow path)
99-0113-00	PCRM-120 post-column derivative device (dual flow path)
91-0110-00	AAK specific column for amino acid (4.6 mm x 250 mm)
91-0111-00	C18 column, 5 µm, 4.6 mm x 250 mm
75-0062-00	AP-01P vacuum pump
76-0044-00	FB-10T solvent filter (1000 mL filter bottle, 300 mL filter cup, without filter membrane)
76-0045-00	Needle filter (organic, 0.45 µm) pkt of 100
76-0046-00	Needle filter (drainage, 0.45 µm) pkt of 100
14-0319-00	Filtration membrane (organic 0.45 µm, 50 mm) pkt of 100
14-0320-00	Filtration membrane (drainage, 0.45 µm, 50 mm) pkt of 100

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GBC Scientific Equipment
Manufacturer of world-class scientific instruments and accessories
— AAS, HPLC, ICP-OES, ICP-TOFMS, UV-Vis, XRD, GC and GC-MS

1/2 Naxos Way
Keysborough Victoria 3173
Australia

Telephone: +61 3 9588 6666
Fax: +61 3 9588 6677
Email: gbc@gbcsci.com
Web: **www.gbcsci.com**

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