HPLC

YL9100 / YL9300

High Performance Liquid Chromatograph

Think Smart Work Better

YL9100 HPLC (High Performance Liquid Chromatograph)

YL's HPLC is built to provide an exceptional cost/performance ratio. Continued research and development provide high-end performance and features, whilst a state of the art manufacturing facility ensures that quality is not compromised. With more than 20 years experience and development, we are proud to present our new generation of HPLC, YL9100 HPLC.

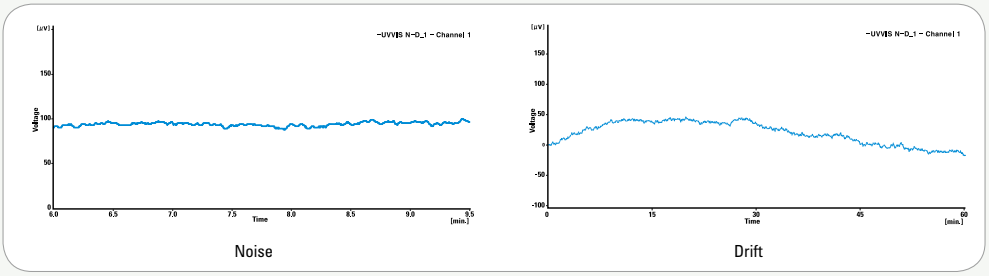
Think Smart Work Better

> When the time came to replace the aging HPLC equipment in my laboratory, the YL9100 exceeded my expectations, but not my budget. We now have great looking, modern HPLCs, with the performance and functionality I required, yet at a fraction of the price I expected. The Windows based Chromatography Data System has proved to be a great success with my analysts.

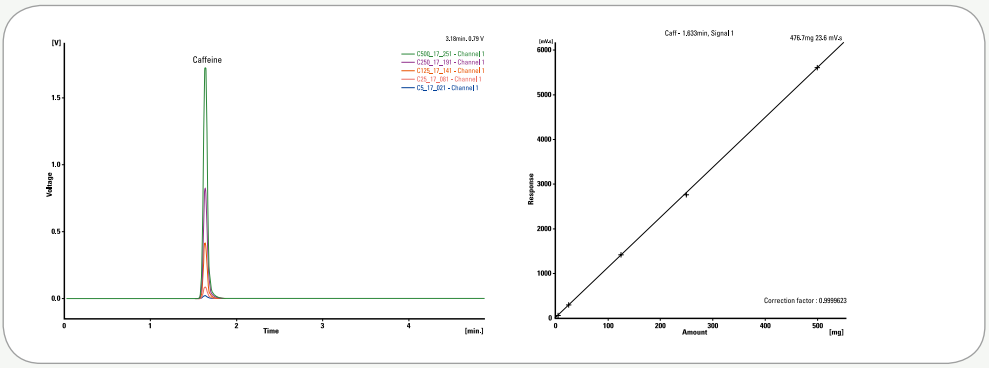
Remarkable Stability

Analysts can waste their time waiting for excessive baseline noise and drift to stabilize.

The YL9100 HPLC delivers a very stable baseline to maximize analysis up-time.



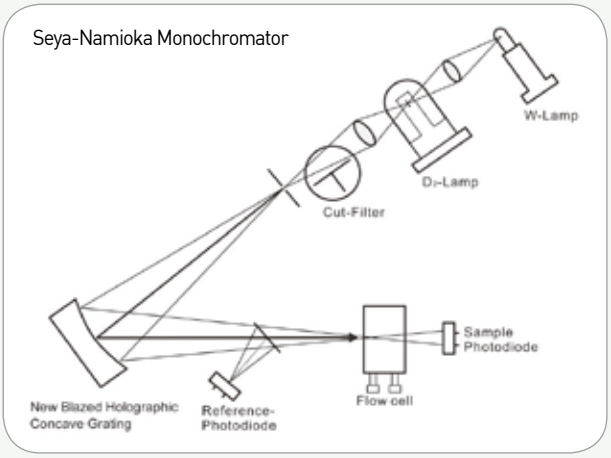
With automatic compressibility compensation minimising back-flow in the pump, the YL9100 HPLC provides accurate and precise flow rates.



Superior Sensitivity

One of many innovative features of the YL9100 HPLC is shielded optic design, which protects the optical components from dangerous contaminants such as fine dust or harmful gases, providing high detection sensitivity.

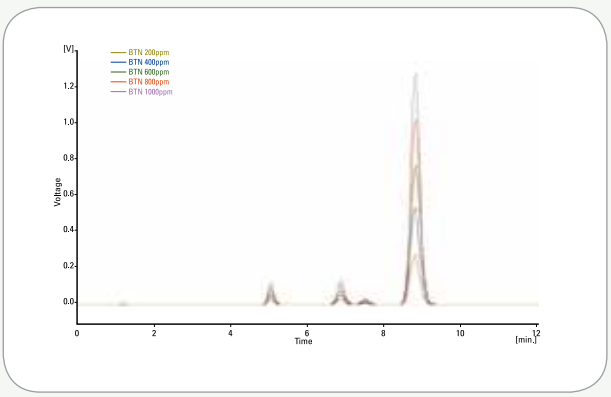
In addition, the Seya-Namioka Monochromator and a new Blazed Holographic Concave Grating enhance light intensity, ensuring high sensitivity over the entire wavelength range.



Outstanding Reliability

Reliability is an essential feature of the modern HPLC and the YL9100 absolutely meets this demand.

- YL9101 vacuum degasser perfectly removes dissolved gases and air bubbles, with the added convenience of an integrated tray to safely house solvent bottles.
- Automatic rinsing extends the life of the pump seals.
- YL9131 Column Compartment with peltier cooling providing a wide range of temperature from 4°C up to 90°C. Effective temperature control ensures retention time reproducibility and reliable data.

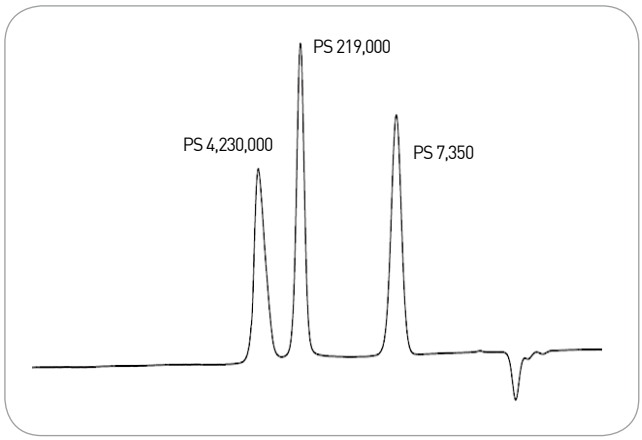


GPC (Gel Permeation Chromatograph)

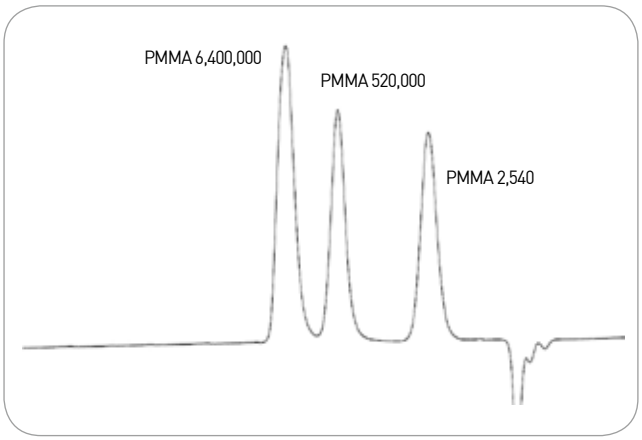
YL GPC system is to provide easy and convenient solution to analyze various natural compounds or synthetic compounds. The standard that is the most similar to the molecular structure of sample has to be chosen, and then dissolve the sample in soluble solvent such as THF, DMF or Alkaline solutions.

Depending on the solution in which the standard and sample were dissolved, choose the GPC columns and analyze the relative molecular weight and the distribution of molecular weight. YL increase the analysis efficiency with providing the mostly common standards and proper columns by the sample.

Fat-soluble standards (Polystyrene, Polymethylmethacrylate)



[Fig. 1] PS analysis by molecular weight (THF)



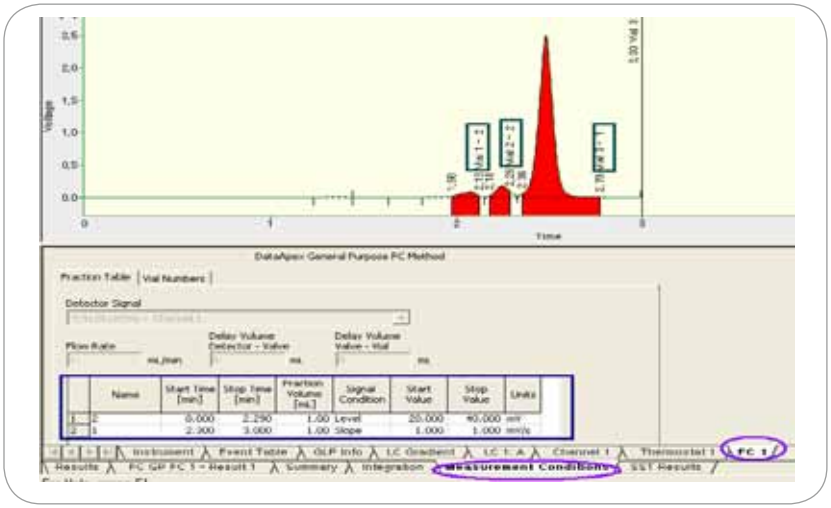
[Fig. 2] PMMA analysis by molecular weight (THF)

Semi-Preparative HPLC

YL Semi-Preparative HPLC System is to be used for the isolation and purification of a valuable product in the pharmacology, materials research and analysis of natural compounds, etc, with the superior efficiency.

With a chromatography data system, it's easy to control the preparative volume through a fraction collector depending on compounds, ranges, etc from μL to mL scales upon the system configuration.

It's easy to collect the separated components by compounds, time, etc and monitor them through software. Users can control the amount of separated compounds depending on the analysis condition to get more accurate fraction collection.



[Fig. 3] Sample Preparative Analysis by a Fraction Collector

Specifications

Solvent Delivery Pump

YL9110 Quaternary Pump

- Operating principle : Parallel dual-plunger pump, Low-pressure gradient
- Number of Solvent : up to 4 solvents
- Gradient formation : 4-channel mixing valve
- Composition Precision : < 0.1 %
- Composition Accuracy : < 0.5 %

YL9112 Isocratic Pump

- No mixing valve
- Operating principle : Parallel dual-plunger pump
- Easily upgraded to YL9110 Quaternary pump

YL9111 Binary Pump

- Operating principle : Double Parallel dual-plunger pump, High-pressure gradient
- Number of Solvents : 2

Pump Specification in Common

- Compressibility compensation : Automatic
- Flow range: - Analytical : 0.001-10 mL/min
  - Semi-prep : 0.01-50 mL/min
- Flow rate accuracy : ≦±1 % at 1 mL/min
- Flow rate precision : 0.1 % RSD at 1 mL/min
- Maximum pressure

- Analytical : 6000 psi
› Operating range : 0-6000 psi up to 5 mL/min
› Operating range : 0-3000 psi at 5-10 mL/min

- Semi-prep : 3500 psi
› Operating range : 0-3500 psi up to 35 mL/min
› Operating range : 0-2500 psi at 35-50 mL/min

- Semi-automatic prime/purge
- Safety & maintenance : Leak detection, Diagnostics, Error detection

TP Control Module for YL9100 Series Pump (Stand-alone type)

This pump key controller is for the use of process or the use of single unit itself. It can control all functions of pump and indicate each factor clearly.

• Function

- Method Programming
- Solvent Mixing Rate
- Prime / Purge
- Flow Calibration
- Maintenance Control
- Pressure Zero

• Features

- 4.2 inch wide, vivid and sensitive LCD touch screen
- Logical instrument monitoring
- Method programming and keeping
- For the use of process / For the use of single unit

Detector

YL9120 UV/Vis Detector

- Wavelength Range : 190-900 nm
- Data collection rate : up to 50Hz
- Light Source : Deuterium lamp & tungsten lamp
- Noise level : <±0.5 X 10^{-5} AU , 254 nm, dry cell
- Drift : <1 X 10^{-4} AU/hr
- Bandwidth : 5.5 nm
- Wavelength Accuracy : ±1 nm
- Wavelength Precision : ±0.1 nm
- Linearity : >99.5 % for 2.5 AU (acetone, 254 nm)
- Path Length : 10 mm (Analytical cell) / 3 mm (Semi-prep cell)
- Cell Volume : 10 µL (Analytical cell) / 5 µL (Semi-prep cell)

YL9160 PDA Detector

- Slit Bandwidth : 1.7 nm
- No. of PDA Channel : 1024
- Pixel Resolution : 0.9 nm
- Wavelength : 190~950 nm
- **Analytical Cell**
  - Path-length : 10 mm
  - Pressure : < 1500 psi
  - Volume : 13 µL
- **Semi-prep cell**
  - Path-length : 3 mm
  - Pressure : < 1500 psi
  - Volume : 5 µL
- Noise Level : < ± 2 x 10^{-5} AU (Empty Cell, 1 sec Rise Time, 254 nm)
- Drift : < 2 x 10^{-4} AU/hr (Baseline Correction), 0.001AU/hr (Room Temp)
- Wavelength Accuracy : < 1 nm (HY-1 Holmium Oxide Filter)
- GLP Compliance: - Photometric Accuracy, Linearity, Noise Level, Drift
  - System Check

YL9170 Refractive Index Detector

- RI Range : 1.00 ~ 1.75 RIU
- Noise : ≦ 5 x 10^{-9} RIU (Analytical) / ≦ 10 x 10^{-8} RIU (Semi-prep)
- Flow Cell Volume : 9 µL (Analytical) / 7 µL (Semi-prep)
- Cell pressure : 6 kg/cm^2 (84 psi)
- RS232 Control

YL9180 ELSD

- More Sensitive
- General Laboratory

YL9181 ELSD (Evaporative Light Scattering Detector)

- Highly Sensitive
- Advanced Research
- Cooling Down to 10°C for Chamber

- Patented Thermo-Split : Vapor Phase Control for optimum sensitivity
- Very low detector volume resulting in the smallest peak within 3 sec.
- A single multi-flow, nebulizer for use with micro-bore to semi-preparative flow rates.

Other Detectors

Electrochemical Detector(ECD)

ECD is a detector for HPLC applied to variable analyses such as biogenic amines, phenols, vitamins, DNA adducts, inorganicions and amino acids.

Fluorescence Detector(FLD)

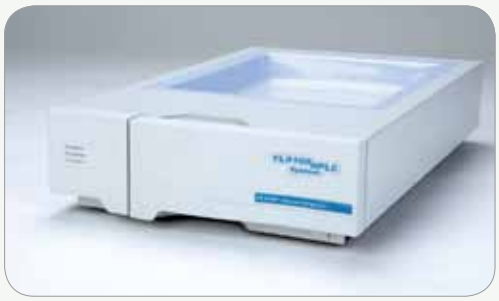
FLD is a highly sensitive, scanning fluorescence detector for liquid chromatography. It provides exceptional optical performance and operational flexibility for routine and trace analysis.



Vacuum Degasser

YL9101 Vacuum Degasser

- Number of channel : 4 Channels
- Maximum flow rate : 10 mL/min per channel
  > 0 ~ 2.0 mL/min per channel for 70 % Gas Removed from Methanol
- Internal volume per channel : 925 µL per channel
- Materials in contact with solvent
  : TeflonAF and PEEK



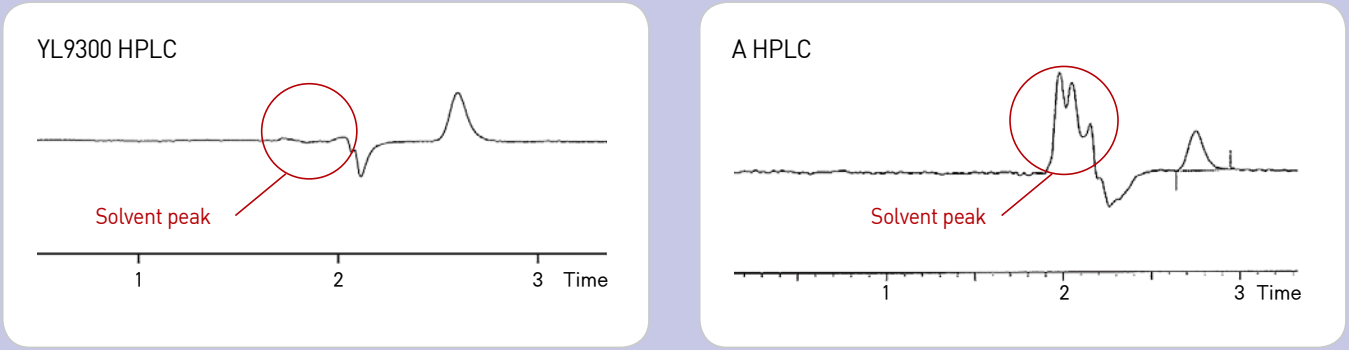
Column Compartment

YL9131 Column Compartment

- Temperature range : 4 °C (Cooling) - 90 °C
- Temperature stability : ±0.05 °C
- Temperature accuracy : ±0.5 °C
- Temperature programs : 40 Steps
- Column capacity : - Analytical : Max. 3 ea of 30 cm column(Max. OD 18 mm)
  - Semi-prep : Max. 2 ea of 30 cm column
- Heat-up time : 16 minutes from 4 °C to 90 °C
- Cool-down time : 13 minutes from 90 °C to 4 °C
- Column switching : max. two automatic 6-port valve (optional)

YL9300 HPLC (High Performance Liquid Chromatograph)

YL9300 HPLC is an integrated HPLC system in a compact design including a vacuum degasser (mixer), quaternary pump and UV/Vis detector at a competitive price. The focus corrected optical design efficiently reduces mobile phase RI effect and provides enhanced baseline stability with a substantially minimized noise level especially in short wavelength range, which brings decreased solvent related peaks.



[Comparison of a solvent peak influence]

Compact Design

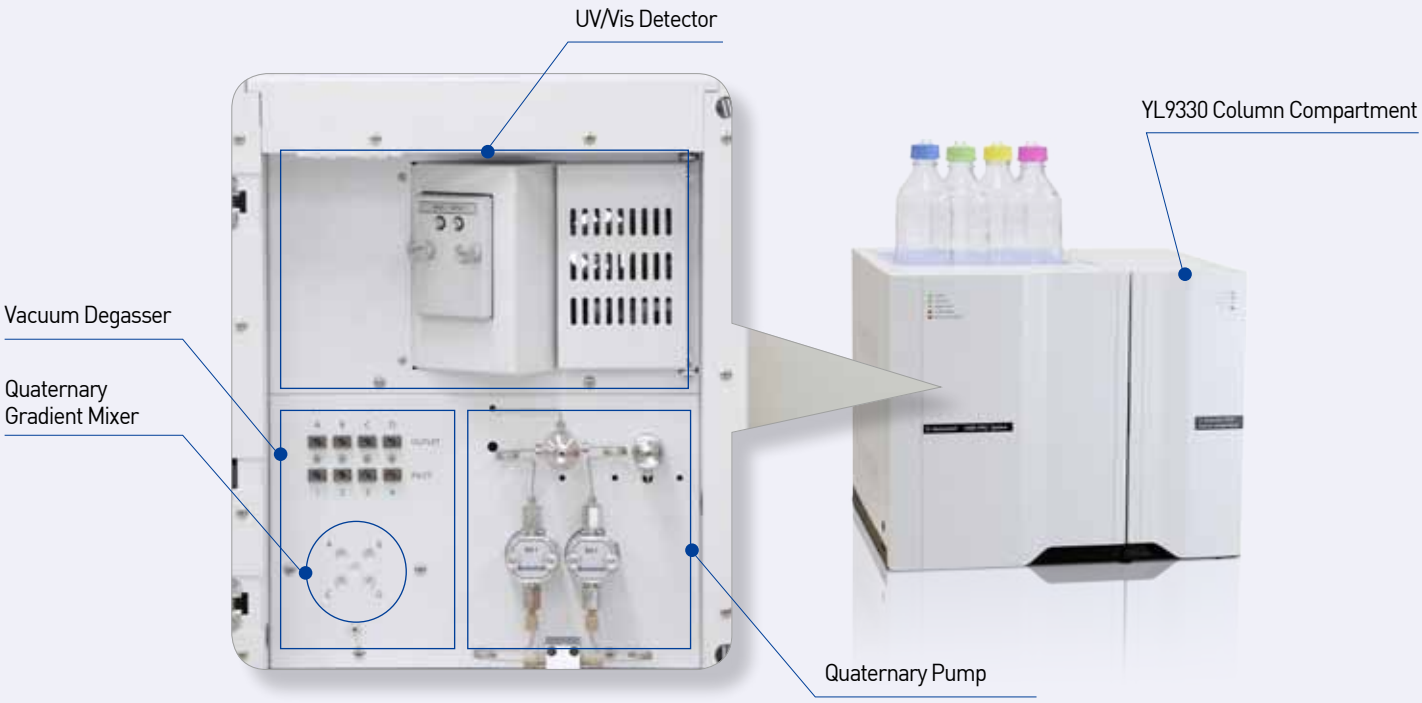
- Integrated LPG(Low Pressure Gradient) HPLC system
- Simple maintenance: Pump & Vacuum Degasser modules in a sliding drawer

Perfect Performance

- Increased mobile phase composition efficiency
- Decreased solvent peak influence
- Narrow spectral bandwidth
- Substantially stabilized baseline with minimized noise level

Impact to Competitors

- Competitive or even lower price than others
- High speed data process by network (LAN) communication
- Low maintenance cost



Vacuum Degasser

- Number of channel: 4 CHs
- Maximum flow rate: 10 ml/min per channel
- Internal volume per channel: 925 ul per channel
- Solvent contact materials: Teflon AF, PEEK and Glass-filled PTFE

Quaternary Pump

- Flow range: 0.001-5 ml/min (Standard)
  0.001-10 ml/min (Option)
- Flow rate accuracy: ≦ ±1% at 1 ml/min
- Flow rate precision: < 0.1% RSD at 1 ml/min
- Number of eluent lines: 4
- Pressure pulsation: ≦ ±0.5 % at 1 ml/min

UV/VIS Detector

- Wavelength range: 190~600 nm (Standard) /190~900 nm (Option)
- Spectral bandwidth: 5 nm
- Wavelength accuracy: ±1 nm
- Wavelength precision: ±0.1 nm
- Linearity: > 99.5% at 2.5 AU (Acetone, 254 nm)
- Noise level: < ±0.35 X 10^{-5} AU, 254 nm, dry cell
- Drift: < 1 X 10^{-4} AU/hour

System Information

- Data communications: LAN
- Dimension: 375 X 470 X 545 mm (W X H X D)
- Weight: 27 Kg
- Safety & maintenance: Leak detection, Diagnostics, Error detection
- Power consumption: 150 W

YL9330 Column Compartment

- Temperature range : 4°C (Cooling) - 90 °C
- Temperature stability : ±0.05°C
- Temperature accuracy : ±0.5°C, with 2-point temp. calibration
- Temperature programs : 40 Steps
- Column capacity : three columns up to 300mm length
  (max OD: up to 18mm)
  Column switching (Option): automatically 6-port SS(PEEK)
  valve up to 2 ea
- Communications: LAN
- Safety & maintenance : Leak detection, Diagnostics,
  Error detection
- Dimensions : 185 x 476 x 480mm (W x H x D)
- Line Voltage : 100-240VAC, ±10%, automatic voltage selection
- Line frequency : 50/60Hz, ±5%
- Power consumption : 150W

Powerful and Intuitive Control

• Features

The sophisticated YL-Clarity and Autochro-3000 data system are easy to use and offer extensive data management plus full control of the entire YL9100 HPLC products and YL6500GC. The software is designed for 21 CFR Part 11 Compliance and through full compatibility with MS Windows OS seamlessly handles data processing and instrument control using an ultra-reliable LAN interface.

21 CFR Part 11 compliance

User accounts

YL-Clarity sets up access rights and passwords (including their parameters e.g., minimum length, validity, etc.). Each user can define the appearance of their own station.

Audit trail

It records selected events and operations into a special file and selected operations directly into a chromatogram.

Electronic signature

Each chromatogram can be signed electronically. Signature selection is based on the username or the signature certificate.

Data Acquisition

Overlay

YL-Clarity simultaneously displays a virtually unlimited number of chromatograms and their mathematical modification; for example, mutual deductions or derivations of any order.

Measuring

Simultaneous data acquisition from up to four independent chromatographs, each chromatograph can acquire data from up to 12 detectors.

Reliable and Convenient Data Management

Integration

There are extensive possibilities to optimize integration. The integration parameters can be changed by entering global parameters or interactively, through direct graphic modification of the baseline.

Calibration

Internal and external standard calculation methods, calibration of groups of peaks and reference peaks method for better identification.

Post run

YL-Clarity automatically displays, prints, exports and starts other programs after the completion of a measurement.

User calculations

Users can define custom calculations in the Result and Summary tables. Using the integrated editor you can create your own columns from original columns and individual mathematical functions.

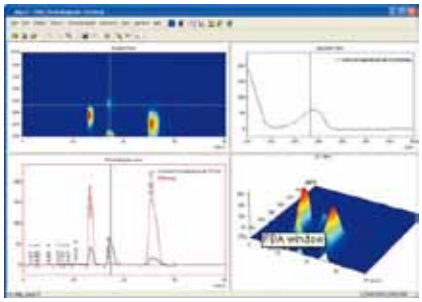
Optional Module (YL-Clarity)

SST (System Suitability Test)

The program compares up to 12 selected parameters calculated according to one of three pre-selected methods (USP, EP, and JP). These calculated values are either compared to the users set limit values for each chromatogram separately or together for the selected series.

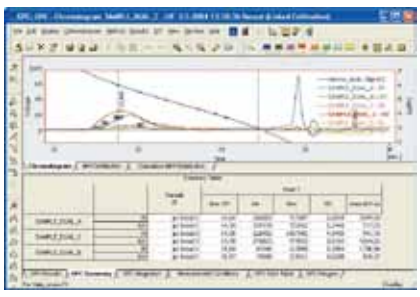
PDA Extension

This is to process data that has been acquired from selected photo diode array detectors. The spectral data, together with chromatograms, adds a third dimension to analytical data analysis.



GPC Extension

This provides interactive and automated GPC analysis, including recalibration and GPC reporting, as well as simplifies the retrieval of GPC data.



Autosampler

YL9150 Autosampler (Alias)

The YL9150 is a high-throughput autosampler with state of the art injection technology, fast injection and wash cycles, and an optional Peltier chiller/heater for samples. Full or partial loop injection along with Pressure-Assisted-Sample-Aspiration (PASA™) is possible.

The highly efficient needle and internal capillary wash virtually eliminates sample carry-over. Cycle time, including wash, is less than one minute.

96 standard 2 mL vials (32 mm x 12 mm) or well plates (96 or 384 capacity, deep or shallow) can be used.

- Sample capacity :
  - Analytical : 2 Micro Well Plates according to SBS standards
  - Semi-prep : 24 vials of 10 mL (LSV)
- Loop volume : 1 - 9999 µL programmable
- Reproducibility : RSD ≦ 0.3 % for full loop injections
  RSD ≦ 0.5 % for partial loopfill injections
  RSD ≦ 1.0 % for µL pickup injections
- Carry-over : < 0.05 %
- RS232 Control
- Cooling/Heating option : 4 °C ~ 40 °C

YL9151 Autosampler (OPTIMAS)

The YL9151 provides the optimum balance of economics and performance, optimizing your injection automaiton, with a carousel holder for sample vial flexibility.

With its three injection modes including zero sample loss injection, YL9151 rivals top-class autosampler performance, while challenging middle-class autosampler prices.

- Capacity : 84 standards 2 mL vials
- Control : Keypad / Software control by RS-232

Manual Injector

Rheodyne 7725i / 9725i

- Industry standard manual injector
- Analytical : 7725i(SUS) and 9725i(PEEK)
- Semi-prep : 3725i

Column Swiching Valve

MX Series II™ (Stand-alone)

MX Series II™ automated high-pressure fluidic valves provides productivity enhancing solutions for today's demanding analytical methods. Combine MX Series II modular valves with your current instrument to support complex fluid switching and sample injection needs.

TitanHP™

TitanHP™ consists of an integrated driver/actuator and a removable liquid-end (Rapid Replacement Pod™) to provide a single, flexible space-saving design. Eliminating the need for development of an internal board and firmware means shorter product development cycles and reduced time-to-market.

DuraLife® wear surfaces extends valve lifetime, which means reduced field service and more customer analysis time between replacements of the wetted surfaces.

SP930D Solvent Delivery Pump

SP930D Solvent Delivery Pump is to be provided for the use of process where requires to supply accurate and precise solvent flow rate as a stand-alone unit. It can also be added to other HPLCs easily and controlled by an intuitive key pad.

- Operating flow range: Analytical 0.001-16.0 mL/min
- Flow precision: < ±0.1 % RSD at 1 mL/min
- Flow accuracy: < ±1 %
- Operating pressure: 0-6,000 psi

YL9200 Series Single Pump

YL9200 series single head pump provides greatly stable flow rate at high pressure up to 6,000 psi to where there is a need of pump for the basic use at economical price. It is provided in 4 models to meet the requirement of various applications.

System information

- Communications : RS232C, Mark in/out, Remote start/stop
- Power : AC100 ~240VAC ±10%
- Display : LCD, 12-key

Models	YL9200N Narrowbore	YL9200B Biocompatible PEEK	YL9200A Analytical	YL9200S Semiprep
Operating Principle	Single head / Rapid refilling			
Control Mode	Constant flow			
Pump Head Volume	25 ul		64 ul	144 ul
Flow Rate	0.001~4.0ml/min		0.001~10.0ml/min	0.001~25.0ml/min
Flow Accuracy	2 %(at 1.0ml/min)			
Flow Precision	0.2 % (RSD)			
Maximum pressure	3500 psi		6000 psi	2500 psi
Compressibility compensation	Automatic (Option)			
Solvent Contact Materials	SUS316, Zirconium, Sapphire, UHMWPE	PEEK, Zirconium, Sapphire, UHMWPE	SUS316, Zirconium, Sapphire, UHMWPE	SUS316, Sapphire, UHMWPE

Optimized HPLC
Post-Column Derivatization System

Pickering Laboratories, Inc., California, USA, a leading company of post-column derivatization chemistries and technology, has made a contract to supply the post-column derivatization system based on our YL9100 HPLC system. The PINNACLE PCX combined with YL9100 HPLC system offers the complete package of chemicals, columns, methods and post-column systems and reflects the ease of use, reliability and ruggedness you have come to expect.

- Powerful Software Control
- Electronic Syringe Pump & Valve
- Flexible Reactor
- Column Heater Fast & Stable
- Usability Design
- Special Columns & Chemistries

Chromatograms

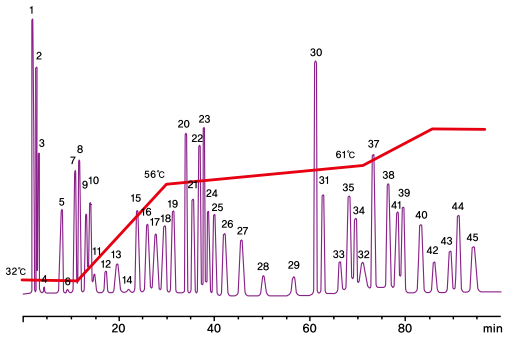


Figure 1. High-efficiency Lithium for Physiological samples using temperature gradient

1. Phosphoserine
2. Taurine
3. Phosphoethanolamine
4. Urea
5. Aspartic acid
6. Hydroxyproline
7. Threonine
8. Serine
9. Aspargine
10. Glutamic acid
11. Glutamine
12. Sarcosine
13. a-Aminoadipic acid
14. Proline
15. Glycine
16. Alanine
17. Citrulline
18. α-Amino-n-butyric acid
19. Valine
20. Cystine
21. Methionine
22. Allo-isoleucine
23. Cystathionine
24. Isoleucine
25. Leucine
26. Tyrosine
27. Phenylalanine
28. β-Alanine
29. β-Amino-i-butyric acid
30. Homocystine
31. ɣ-Aminobutyric acid
32. Tryptophan
33. Ethanolamine
34. Hydroxylysines
35. Ammonia
36. Creatinine
37. Ornithine
38. Lysine
39. Histidine
40. 3-Methylhistidine
41. 1-Methylhistidine
42. Anserine
43. Carnosine
44. Homocarnosine
45. Arginie

Specifications

Reagent Pump

- Pulse free syringe pump
- Single piece ceramic barrel
- Programmable flow rate
- Flow range : 50 - 1500 µL/min
- Automatic piston wash
- Automatic reagent flush cycle

Reactor

- Heated reactor for temperature from 5 °C above ambient to 130 °C
- Easy replacement coil cartridges
- Range of reactor dwell volumes; 0.1 mL to 3 mL

Column Heater

- Programmable temperature gradient
- Easy Column access

Safeguards

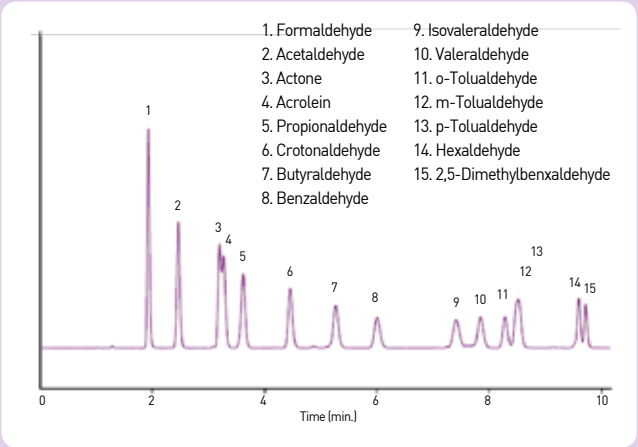
- In line check valve : prevent reagent back flow
- Replaceable column & reagent filters
- Post column system over pressure
- Back-pressure regulator: Applies 7 bar (100 psi) to the detector flow cell outlet (waste) to prevent detector noise and precipitation due to out-gassing or boiling

Versatile Dedicated Analyzers

We provide customized systems with analysis methods and application that completely meet analysis purpose and requirement for convenience in your lab.

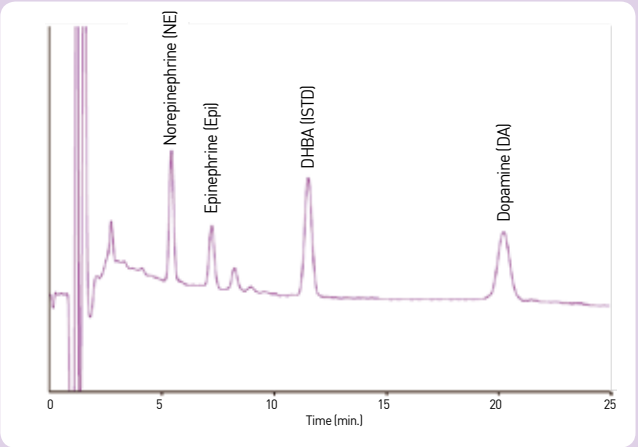
■ Formaldehyde Analyzer

It delivers the optimum solution for derivatization analysis of formaldehyde with the appropriate system configuration according to Indoor Air Quality Management which is getting interested in recent years.



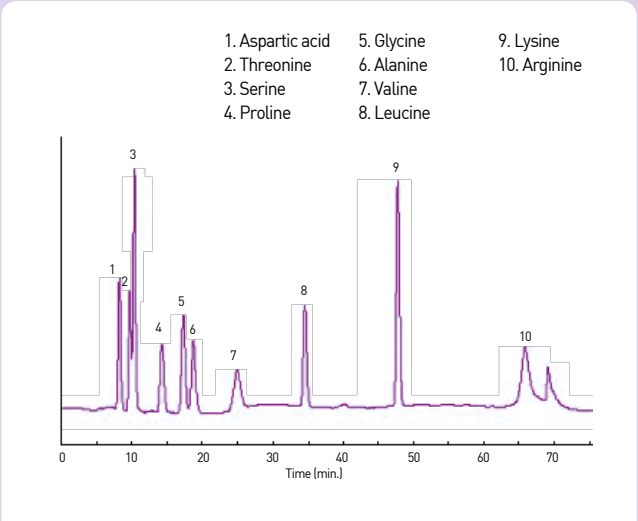
■ Catecholamine Analyzer

It provides all the solutions such as a sample preparation, a short time to stabilize the ECD (Electrochemical detector), setting for optimum condition, keeping the sensitivity and replacement and cleaning of cell.



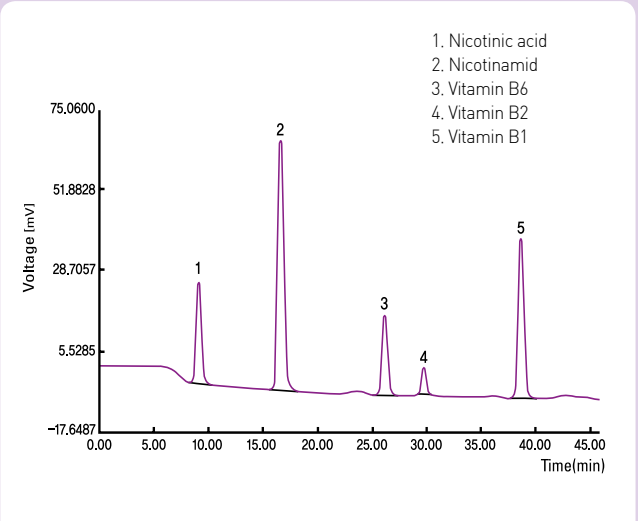
■ Amino Acid Analyzer

YL Amino Acid Analyzer is to analyze the first or second amino acids with a variety of solutions in an easy way. With a superior sensitivity, this enables to detect derivatized natural amino acids in animal tissues, broths, fruits and beverage juices and hydrolyzed amino acids in protein, collagen, peptides, and processed foods.



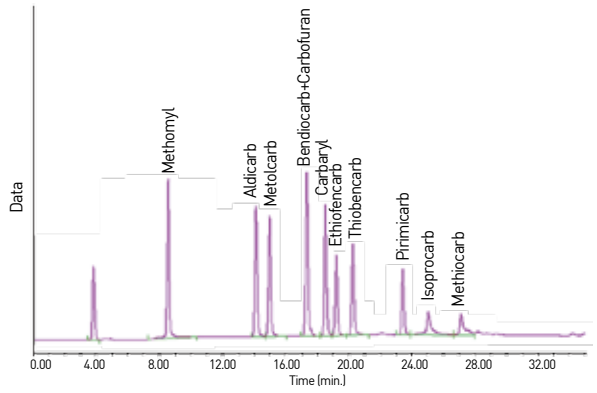
■ Vitamin Analyzer

Vitamins are unstable compounds, which are easily oxidized and destroyed during sample preparation procedures. This specified vitamin analyzer is optimized for the analysis of both water-soluble and fat-soluble vitamins by supplying entire solutions.



Carbamate Analyzer

The analysis of pesticide using Post-Column derivatization gives analysis and quantitative analysis by automatic sample preparation at the same time.

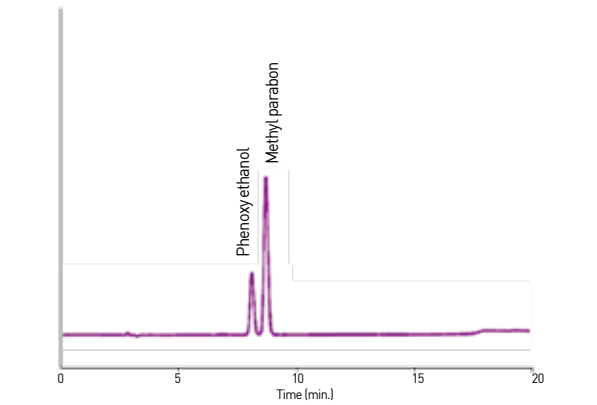


Methylparaben Analyzer

YL Methylparaben Analyzer efficiently analyzes Methylparaben and Phenoxyethanol which are very commonly used as preservatives for cosmetics, drugs and other skincare products but they may cause toxicity at higher concentration to human body.

For they have an absorbance at UV/Vis wavelength range, these are usually analyzed by HPLC after extracted by organic solvents such as Methanol or DMF.

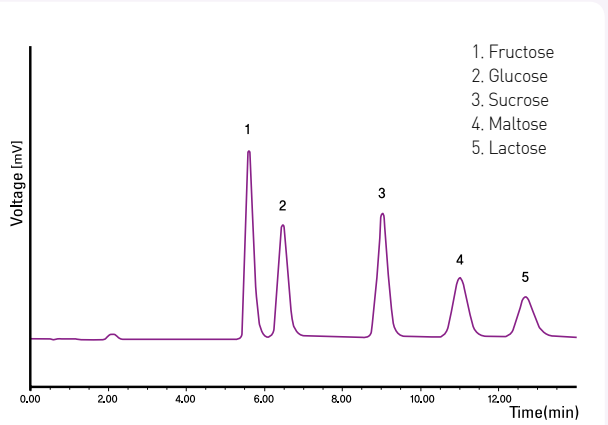
Our dedicated analyzer for Methylparaben/Phenoxyethanol supplies a photo diode array detector to provide accurate results separating all other impurities in the sample.



Sugar Analyzer

Sugar, as a major component of food, is very soluble in water and it has various types of stereoisomers. Commonly there are many testing limitations such as low peak-resolution due to various stereoisomers, poor column durability due to water-soluble solvent and limited usage of detectors. Especially, the RI detector has low sensitivity and no gradient mode.

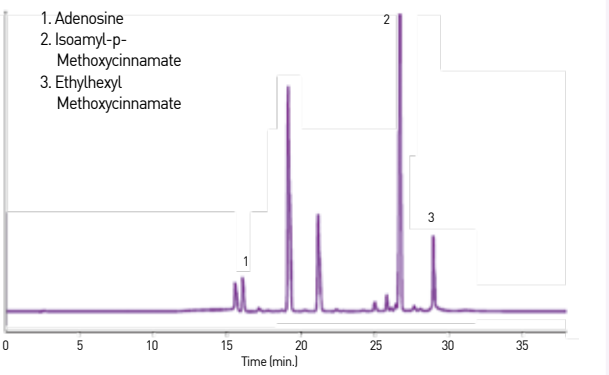
YL Sugar Analyzer provides an accurate column analysis result and a method of making solvents with the use of ELSD (Evaporative Light Scattering Detector) to remove these problems and can be usefully applied to analyze these compounds and determine their quantitative analysis.



QC Analyzer

In quality control laboratories, most of QC programs are to ensure that the analysis results are accurate, reliable and reproducible to reach the required specification while take substantial time.

YL QC analyzer using an autosampler reduces the analysis time and strengthens the convenience of use by an intuitive chromatography data system to increase the analysis efficiency.



YL9100 / YL9300

High Performance Liquid Chromatograph

YL INSTRUMENT CO., LTD.

Young Lin Bldg., 899-6, Hogye-dong, Anyang, 431-836, Korea
TEL : +82-31-428-8700 / FAX : +82-31-428-8779 E-mail : export@younglin.com

www.ylinstrument.com

JAS-ANZ

ISO9001 Certified

These Products are manufactured by Young Lin ISO 9001-certified facility that is periodically audited by the registering body to ensure compliance