

HPLC Solvent Delivery Modules

*Premier Instruments for High
Performance Liquid Chromatography*



Flexible, Accurate and Reliable Solvent Delivery Modules for HPLC

Challenging applications require flexibility and high performance

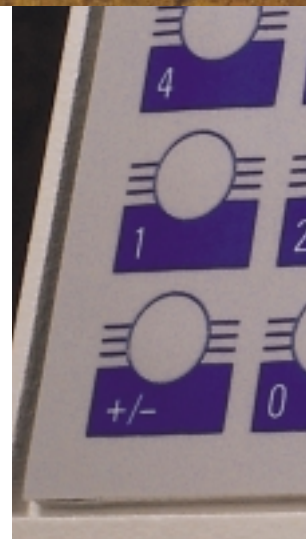
Rapidly changing requirements for analytical assays mean that today's isocratic application may change into a complex gradient separation tomorrow. The GBC 1100 Series solvent delivery systems allow you the flexibility to upgrade with the changing world...from simple isocratic to binary and quaternary gradient without discarding your existing equipment.

Method storage saves time and increases productivity

Stored methods, recalled with simple, easy to master function keys, save time and money with fast set-up and efficient routine analysis. Automatic start-up and shut-down methods ensure that your system is ready when you are, maximizing sample throughput and minimizing equilibration time. This also saves solvent, reducing operational costs compared with other systems. With an integrated purge valve and one of the lowest dead-volumes available, solvent changes are fast and easy.

Robust design for reliability

Leak sensors, bubble detectors, pressure limits, compressibility compensation and solvent level monitors, combined with only two check valves, provide assurance that your samples are running correctly, notifying you of occurrences which may jeopardize your results. Accessible external fluid path components and piston-seal wash facility make routine maintenance simple and easy. A built-in pump cycle counter keeps track of seal and check-valve wear so that preventative maintenance may be scheduled.



**GBC LC1120 and LC1150
Solvent Delivery Modules
are designed specifically for
the analyst, overcoming
many of the difficulties
encountered with other
pump designs.**

**Free-floating dual in-series
pistons, with variable
volume delivery, guarantee
reproducible flows with low
piston-seal wear. This
means accurate quantitative
determinations every time.**



GBC LC1120 and LC1150 Solvent Delivery Modules offer the most modern, innovative and technologically advanced designs available for any HPLC pumping system. With complete diagnostics and upgrade capabilities, analytical integrity is assured, now and in the future.



Performance, Reliability and Upgradability

Flow—the most important parameter

The essential task of an HPLC pump is to provide stable flow. Without it, other features are meaningless. High Performance Liquid Chromatography relies on precise accurate flow for valid analytical results. Without stable flow, response from Refractive Index and Electrochemical detectors is questionable. Quantitation from all other detectors also suffers, particularly for sensitive analysis.

Most pumps utilize fixed-volume piston strokes to deliver the solvent. The majority of these pumps have 100 μL volumes per stroke at all possible flow rates. This results in dramatic pressure fluctuations and flow rate changes as the pistons cross over.

GBC pumps utilize a variable stroke mechanism, matching the flow rate with stroke volume for minimal pressure fluctuations. The piston displacement varies between 16 and 100 μL .

Advanced engineering and extensive diagnostics mean dependable operation

Your samples are the most valuable items in your laboratory. You cannot afford to waste them. With the GBC LC1120 or LC1150, all aspects of your analysis are continually monitored during operation. You are instantly notified of any deviation from set operational limits, or, during unattended operation, the details of the error are noted in the electronic log book to alert you when you return.

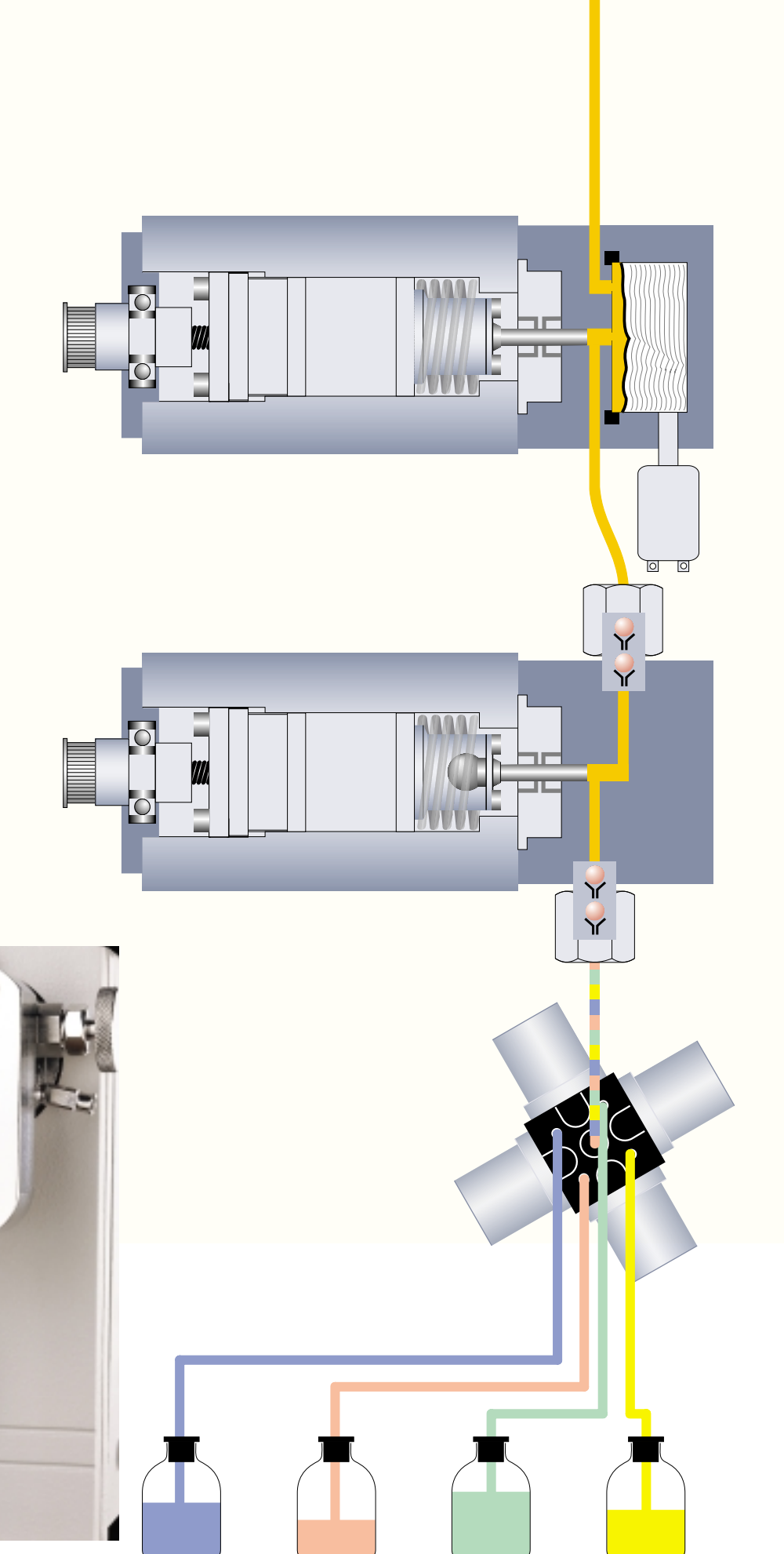
One pump for isocratic or quaternary capability

The LC1120 isocratic pump can be upgraded simply to binary or quaternary capability. The quaternary LC1150 additionally provides the flexibility to store up to ten methods in memory, recall and execute them at the touch of a key, monitor the current method, or create a new method during an analytical run.

Many fixed-stroke pumps have difficulty performing precise low pressure gradients due to fixed delivery frequency and composition timing. The GBC LC1150 overcomes these problems with its variable displacement, unique flow path and efficient mixing scheme.

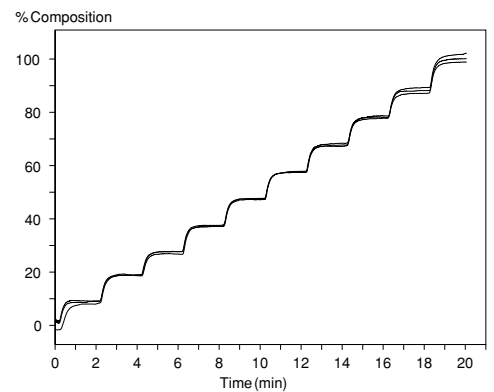
GBC's LC1120 and LC1150 HPLC Solvent Delivery systems provide the most versatile, precise and accurate pumping systems available. The result of years of innovation, and design enhancements on established engineering techniques, they are the premier components for High Performance Liquid Chromatography.





Precision gradients through engineering and research

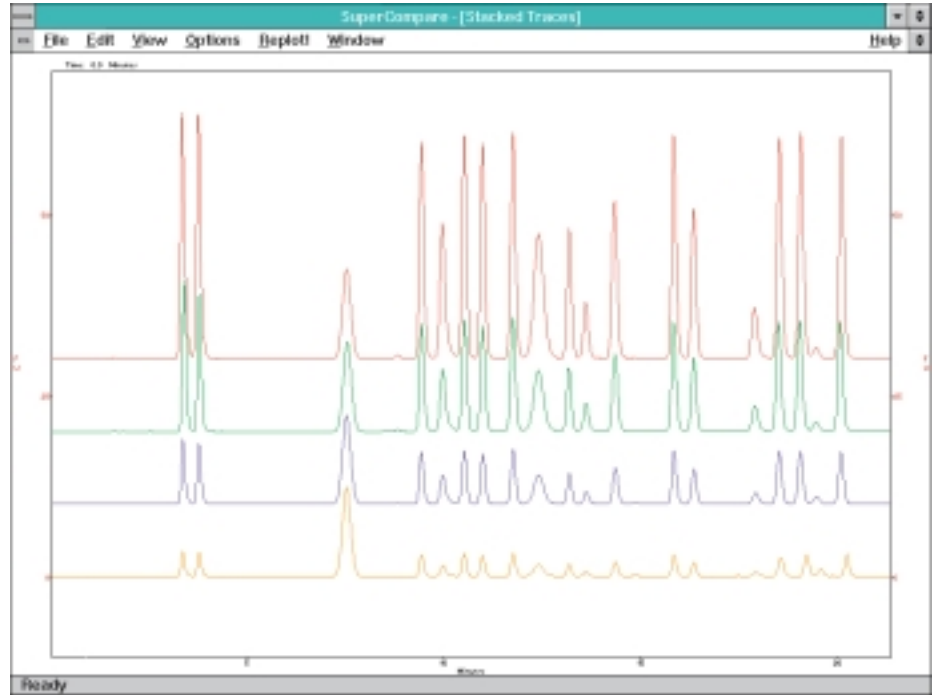
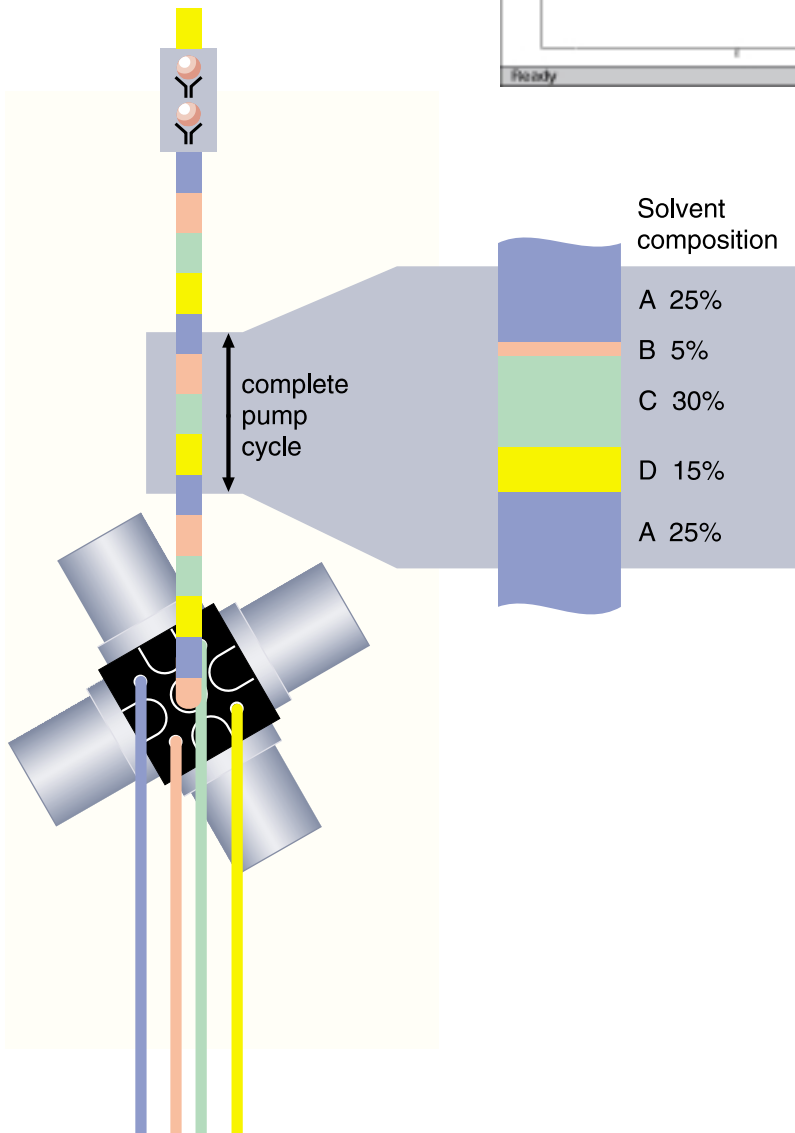
The solvent proportioning valve is internally matched to each pump. This ensures the best compositional accuracy and precision, regardless of solvent selection. With a 700 μL dwell volume, our gradients are the sharpest available, and step gradients are as close as possible to ideal. The flow path is designed for maximum turbulence, allowing complete mixing in a very small volume, eliminating the need for an external mixer. Combining these features with a unique method of solvent proportioning, GBC has produced the finest quaternary gradient solvent delivery module available.



Stepwise gradient profile, 0% to 100% in 10% steps. Overlay: 5, 10 and 20 MPa. Flow Rate: 2.5 mL/min

Compositional accuracy

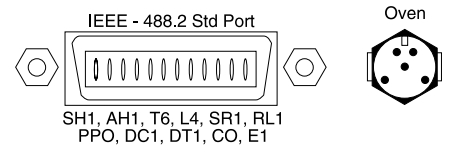
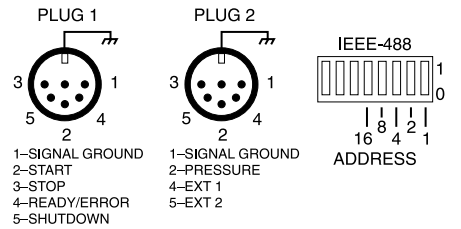
The incorporation of the variable piston stroke mechanism enables a complete gradient to be delivered to the column in each pump cycle. For added accuracy, an automated algorithm splits the largest solvent component, sandwiching the smallest in the centre of the stroke.



Connectivity and control

Interactive connection of the pump to the rest of the system prevents costly errors that may ruin valuable analyses.

With two external events per method, the pump can be used to automatically trigger other chromatography modules, enabling unattended operation.



A full range of control functions is accessible from the back panel, enabling standalone operation or system software control.

Specifications

LC1120/LC1150 Solvent Delivery Systems

Hydraulic System

Dual in-series floating pistons driven by variable stroke mechanism with piston displacement from 16–100 μ L.

Flow Rate Range

0–9.99 mL/min, in 0.01 mL/min increments.

Flow Rate Precision

0.1%, independent of system pressure.

Solvent Selection (LC1150)

Up to four solvents may be selected and mixed.

Composition Range (LC1150)

0–100% in 0.1% increments.

Composition Accuracy (LC1150)

0.5%, independent of system pressure.

Composition Precision (LC1150)

0.1% RSD, binary gradient water/acetonitrile.

Delay Volume (Dwell Volume)

600–900 μ L, dependent on system pressure.

Compressibility Compensation

User-programmable compensation for changes in flow rate at varying system pressures and solvent compositions.

Pressure Pulsations

Typically 1.0% of system pressure at all pressures up to 10 MPa.

Pressure Range

Operating pressure range from 0–40 MPa (6000 psi) to 5 mL/min; from 0–20 MPa (3000 psi) for flow rates >5 mL/min. Real time display in MPa or psi.

Method Storage (LC1150)

10 methods, each with up to twenty steps (160 steps max.) stored in battery-backed RAM. Method editing is possible during a run.

Display

2 line x 16 character illuminated LCD with real-time display of operating parameters and status.

Integrated keyboard.

Numeric, cursor and function keys.

Parameter editing possible during a run.

Analogue Output

25 mV/MPa for pressure monitoring.

Remote Control

Output: Ready/error. Input: Remote shutdown, Start, Stop.

Remote Communications

Standard IEEE-488.2 communications.

Diagnostics and Safety Aids

Detected errors stored in the error log and displayed via the front-panel LEDs, with audible alarm and/or interactive error message. Diagnostics include start-up testing, solvent leak and level detection, system pressure monitor, min/max pressure, bubble detection, pump cycles, equilibration monitor, pressure trace. Safety aids include programmable flow ramp rate and pump purge monitor to protect columns.

Operating Environment

4 to 40°C, <85% relative humidity (non-condensing).

Power Requirements

100–120/220–240 V, 50–60 Hz.

Dimensions

263 x 183 x 450 mm (WxHxD).

Weight

Nett 16.4 kg, Shipping 20 kg.

LC1460 On-Line Degasser

Type

Vacuum filtration, four channels

Degassing Efficiency

<2ppm at 3 mL/min (water at 25°C)

Internal Volume

<7 mL (per channel)

Wetted Flow

PEEK, PTFE

Maximum Flow

10 mL/min

Outputs

Two signals on error condition for shut-down of connected devices

Maintenance

Self cleaning vacuum system

Dimensions

72 x 135 x 310 mm (WxHxD)

Column Oven (Optional)

Temperature Range and Stability

(Ambient +5)°C to (Ambient +50)°C \pm 0.1°C.

Temperature Control

Proportional readout, °C or °F.

Column Capacity

2 columns, each 250 mm x 4.6 mm.

Oven Dimensions

46 x 56 x 300 mm (WxHxD)

The GBC LC1120/LC1150 Solvent Delivery Systems will improve the productivity and profitability of your laboratory because...

- ❑ Quaternary solvent delivery system provides maximum flexibility in method development and routine usage.
- ❑ Tiny 700 mL dwell volume provides for sharp gradients and eliminates the need for a separate mixer.
- ❑ Dual piston design with two check valves ensures increased reliability, and superior flow characteristics with minimum pressure fluctuations.
- ❑ Variable stroke hydraulic system maximizes flow stability.
- ❑ Free-floating pistons with seal wash minimize seal and piston wear for maximum up-time.
- ❑ Comprehensive diagnostics help to schedule preventative maintenance and maximize up-time.
- ❑ Logical key pad functions are easy to use for rapid start-up and operation.
- ❑ Auto start-up and shut-down methods maximize the time available for analysis by performing equilibration runs before the day begins or after the day ends.
- ❑ Solvent level monitoring prevents the unnecessary waste of samples.
- ❑ Upgrade path for isocratic LC1120 provides low-cost entrance with expandable options without the necessity of retraining for new components and software.
- ❑ External event triggers for other chromatography modules



Designed and manufactured by
GBC Scientific Equipment Pty Ltd
A.B.N. 30 005 472 686

GBC reserves the right to change
specifications without prior notice.

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GBC Scientific Equipment is a
manufacturer of world class
instrumentation—
HPLC, AAS, ICP-OES, ICP-TOF-MS, UV-VIS,
and Rheometry

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HPLC system including pumps, detectors, autosampler and data station.

GBC supplies a wide range of HPLC equipment and applications information for almost every aspect of High Performance Liquid Chromatography, including:

HPLC solvent delivery modules
(isocratic, binary and quaternary)

UV-Vis detectors (variable wavelength,
dual wavelength, scanning and rapid
scanning)

Fluorescence detector

Conductivity detector

Refractive Index detector

Electrochemical detector

PhotoDiode Array detector

Auto injectors (pre-injection
derivatization, small volume,
variable volume capability)

Data acquisition and management
(Windows® or MS-DOS®)

Columns and accessories



LC1150 pump kit, including degasser and solvent organiser

LC1150 Pump Kit

The GBC LC1150 Pump kit combines the high performance LC1150 Quaternary Gradient HPLC Pump, LC1460 On-Line Degasser and LC1445 System Organiser in a single kit. This kit is a complete and cost-effective solution to solvent delivery requirements in both gradient and solvent blending isocratic applications. It comes complete with solvent bottles, tubes and fittings for immediate operation.

Ordering Information

- 100-112000 LC1120 Advanced Spindle-Driven HPLC Pump
- 100-115000 LC1150 Quaternary Gradient HPLC Pump
- 100-115502 LC1150 Pump Kit consisting of:
 - 1 x 100-115000 LC1150 Quaternary Gradient HPLC Pump
 - 1 x 100-146001 LC1460 On-Line Degasser
 - 1 x 99-0288-00 LC1445 System Organiser
 - 4 x 97-2057-00 Solvent Bottle and Cap (with tube fittings).

Options

- 100-015500 LC1120/LC1150 Column Oven Option Kit
- 99-0330-00 TC2000 Peltier HPLC Column Oven
- 100-146001 LC1460 On-line Degasser
- 100-144000 LC1440 System Organiser with built-in Helium Sparging
- 100-003000 LC1120 to LC1150 Upgrade Kit.

