



HPLC-GPC-3000i



EPCC / PRODUCTS / APPLICATION / SOFTWARE / ACCESSORIES / CONSUMABLES / SERVICES

Analytical Technologies Limited

An ISO 9001 Certified Company

www.analyticalgroup.net



Engineered using the core competencies of our experience, HPLC-3000i provides superior data quality, excellent robustness and long-term performance.

Key Technologies:

- Connections University
- Methods Validation Software and System
- Performance Certified Training and Education

>> Excellent Performances:

The LOD as low as 4x10 ⁻⁹ g/mL		67
Mobile phase:	Methyl alcohol	0.0 -
Flow rate:	1mL/min	RE 03-
Detection wavelength:	254nm	02-01-
RT:	1.0s	00
Sample:	Naphthalene (1×10 ⁻⁷ g/mL)	0 2

Repea	atability	
1-uracil, 2-acetophneone, 3-toluene, 4-ethyl benzene, 5-fluorene		
Peak area of fluorene:	RSD=0.048%	
Retention time of fluorene:	RSD=0.017%	



Baseline Noise



High Resolution		
Analysis method:	HPLC-Pre-Column derivation method	
Derivative agent:	Phenyl isothiocyanate (PITC)	
Column:	Elite AAP C18 column	
Sample:	17 amino acids	

02





Gradient



► In-line degasser

Degassing capacity :	>90%
Volume:	960 µL

P3000i High Pressure Constant Flow GPC Pump:



Delivery Pump	P3000i Isocratic pump (P/N:102010000661)	P3000i Binary pump (P/N:102010000662)	P3000i Quarternary pump (P/N:102010002581)	
Delivery Method	Double piston plunger, series/ parellel.			
Flow Rate Range	0.0001mL/min -10.000mL/min (increment 0.001mL/min)			
Flow Rate Accuracy	±0.5% (@1mL/min, water)	±0.5% (@1mL/min, water)		
Flow Rate Precision	≤0.025% RSD (@1mL/min, water)(ASTM)			
Max. Pressure	9,000 psi (Standard) 12	9,000 psi (Standard) 12,000 psi (Optional) 18,000 psi (Optional)		
Pressure Pulsation	≤0.1 % (@1 mL/min, wate	r, backpressure 60Mpa		
Credient Acources	Nene	-	-0.5%	
Gradient Accuracy	None	≤0.2% SD	≤0.2% SD	
Composition precision	≤0.15%	≤0.15%		
Composition accuracy	±0.5%			
Retention time	RSD 0.1%			
Pump Seal Wash	Automatic, integral, active, recirculating			
Pumping system	Software controlled			
Compressibility compensation	automatic and continuous			
Gradient mixing	Active			
Power Requiments:	100-120V, 60Hz; 200-240 V,50 Hz			
Solvent setting range	4 solvents setting range: 0	-100% with 0.1% step		
pH Range	1 to 12			
Delay volume	≤200µL			
Plunger rinsing	Automatic and programmable			
Safety features	Leak sensor error detection & safe leak handling			
Wet prime	Automatic			
Operation	11 gradient curves	11 gradient curves		
Function	Automatic purge			
Wetted materials	stainless steel 316, Teflor	n, quartz glass, Corrosion	esistant	



► P3000i UV/VIS Detector:



UV-VIS Detector	P3000i UV-VIS Detector (P/N: 102010000674)
Measurement range	0.0001-4.0AU
Wavelength	190-800 nm
Light Source	Deuterium lamp, Tungsten lamp
Spectral Width	≤ 6nm
Wavelength Accuracy	±1 nm
Wavelength Precision	<±0.1 nm
Baseline noise, Single wavelength	≤5.0x10 ⁻⁶ AU
Baseline noise, Dual wavelength	0.25 x 10 ⁴ AU
Drift	≤1x10 ⁻⁴ AU/Hz
Linear Range	≤5% at 2.5AU (ASTM)
Max. Sampling Rate	120 Hz
Flowcell Pressure	1200 PSI
Flowcell light Path	10 mm
Flowcell Volume	14 μL
Flowcell design	suitable flow cell
Detection limit	5x10 [°] g/mL
Lamp Hour	D2 lamp > 2000hr Lifetime
Repeatability	0.1 nm.
Wetted material	SS, PEEK, Fused silica
Cell Temperature	Up to 40 °C



P3000i Refractive Index Detector:



Refractive Index Detector	P3000i Refractive Index Detector (P/N: 101020002866)
Flow cell type	3 chamber-type
Measuring method	Deflection type
Dynamic range	±2.5 x10 ⁻⁴ RIU
Baseline noise	<10-7 RIU
Drift	1x 10 ⁻⁷ RIU/h (pure Water, Response : 1.5 sec)
Response	0.1,0.25,0.5,1,1.5,2,3,6 sec
Minimum quantifiable mass	100 ng of 100 kDa molecular weight polystyrene in THF 100ng of BSA in PBS
Flow Rate	0.1~10.0mL/min
Auto Zero	Full Auto Zero
Auto Zero Range	All Range
Wavelength range	640 nm
Integrator output	DC O TO 1 V (Sensitivity) 4m V/ µRIU,16m V/ µRIU)
Cell Volume	≤12µL
Cell pressure	70 psi
Max .back Pressure	50kpa
IN to Cell	ca .80µL
Internal Volume	cell to Out :ca 600 µL ALL (Cell to Out :ca 690 µL
Recorder output	0 to 10m V/FS
Temperature operating range	5° below ambient to 77°C
External Output	(1) READY (temperature control) (2) LEAK (3) ERROR (ROM, RAM, PARAMETER,HOME POSITION,OVER-HEAT,OPTIBALANCE,INTENSITY)
Temperature Accuracy	± 0.5°C OFF, 30 to 500°C (1°C Step)
Temperature Control	77 °C Temp. fuse (Double Temperature Control)
Communication port	USB
Operational support functions	None
Wetted materials	Stainless steet 316, Teflon, Quartz glass
Valves	purge & recycle
Power Source, Power consumption	AC 100 to 240V +10%, 50/60 Hz, 150VA max.
Dimensions, Weight	W260xD400xH150(mm),ca.12Kg
Temperature Stability	± 0.2°C
RI units	1.00 to 1.75
Light source	LED with a warranty of minimum 10 years



P3000i Light scattering detector:



Light Scattering detector	P3000i Light Scattering detector (P/N: 101020003558)
Measurement principle	RALS 90° angle, LALS 7° angle
Dynamic range	2500 mV
Light source	50 mW, 640 nm laser
Cell volume	18 μL
Minimum quantifiable mass	100 ng of 100 kDa molecular weight polystyrene in THF 100ng of BSA in PBS*
Molecular weight range	200 g/mol to more than 10 ⁷ g/mol
Baseline noise	<0.1 mV
Baseline drift	<0.2 mV/hr
Power	AC 10V / 220V, 50Hz / 60Hz

P3000i Viscometer:



Viscometer	P3000i Viscometer (P/N:113010003800)
Measurement principle	4-capillary Wheatstone bridge with self-balancing mechanism and user-exchangeable capillaries
Detector volume	17 μL/capillary
"Delay reservoir" volume	8 mL per column
Differential pressure dynamic range	±2500 Pa
Differential pressure baseline noise	<0.3 Pa
Minimum quantifiable mass	1µg of 100kDa molecular weight polystyrene in THF
Inlet pressure dynamic range	100 kPa
Inlet pressure baseline noise	0.001 kPa
Baseline drift	<0.2 kPa/hr
Power	AC 10V / 220V, 50Hz / 60Hz



P3000i Diode Array Detector:



Diode Array Detector	P3000i Diode Array Detector (P/N: 102010002799)
Diode Array	1024 diodes
Diode width	≤1.2 nm
Wavelength	190 - 800 nm
Operating mode	Simultaneous acquisition of multiple wavelengths
Light Source	Deuterium lamp & Tungsten lamp
Spectral Resolution	0.6 nm/pixel
Spectral width & Slit width	Programmable 2 to 8 nm
Wavelength Accuracy	± 1 nm
Wavelength Repeatability	± 0.1 nm
Wavelength Precision	± 0.1 nm
Noise	<10x10 ⁻⁶ AU (ASTM)
Drift	<1x10 ⁻³ AU/Hr
Linear Range	≤5% at 2 AU
Max. Sampling Rate	12 channels, 100 Hz Full spectrum, 100Hz
Data Acquisition	100 Hz
Flowcell Pressure	1750 PSI
Flowcell Light Path	≤10 mm
Flowcell Volume	≤10µL with minimum RI effect
Detection Limit	2x10 [*] g/mL (naphthalene)
Wavelength Calibration	Mercury peaks and bult-in homium oxide fiter
Temperature Operating Range	5°C below ambient temp to 50°C (temperature control facility)
Lamp Hour	D2 lamp > 2000hr Lifetime
Rise Time	0.0s - 9.9s
Power	AC 10V / 220V, 50Hz / 60Hz
Consumption	110W
Dimensions	420mm x 280mm x 175mm
Detection	Double Wavelength
GLP function	Date of lamp replacement, number of ignitions, Ignition time, energy and automatic wavelength check etc.
Flow cell design	Taperslit for reduced RI effect.
Resolution	1.2 nm per photodiode
Digital and Optical mode	3D
Provision	Provision of low noise performance within the operable wavelength range



P3000i Autosampler:



Autosampler	P3000i (P/N: 102010001239)
Injection modes	Full-loop Partial loop-fill μL-pick-up
Cross Contamination	<0.02%
Injection volume	Programmable from 0.1 μl-300 μl (0.1 μl increments)
Injections Volume Accuracy	0.1%
Injection precision	Full-loop injection < 0.2% RSD
Injection	1-99 injections per vials
Sample viscosity	0.1 - 5 cP
Needle wash Inside and outside needle wash with drying.wash can be programmed between injections and between vials/wells.	1 solvent 5 additional wash solvents
Injection cycle time	< 18 seconds
Valve switching time	18 msec
Wetted parts	SS316, PTFE, TEFZEL, VESPEL, glass, For Bio-kit option: PEEK and Coalet-steel (needle) ins _t ead of SS316
Carry-over	≤0.0025% RSD with standard wash Typically <0.01% with extra wash Vials: 2x 50 (2 mL)
Sample capacity	2x50 2ml vials(Standard) (optional: 96 well plate)
Safety features	Leak sensor, Automatic rack and Vial recognition
Reproducibility	better than 0.5%
Minimum sample required	10µl residual
Needle rinsing	Automatic needle rinsing before and after every injection
Injection linearity	>0.999
Injection overhead volume	0 μL in μL pickup mode
Injection needle wash	integral, active and programmable
Pressure limit	6000psi (15000psi sampling valve is optional)
Dimensions	300 x 510 x 360 mm (WxDxH) [™] cool 300 x 575 x 360 mm for ALIAS
Standard features	Auto dilution and auto addition
Weight	19 kg,21 kg for ALIAS™ cool
pH Range	1 to 12.5
other	Compatible with back pressure of pump
Syringe volume	250µL standard
Max load on top cover	65 kg
Power requirements	95 - 240 Volt AC ± 10%; 50-60 Hz,200 VA
Sound pressure level	LeAq < 70 dB
Working temperature	4° - 80°C (0.1°C increments)
Temperature Accuracy	±0.5°C
Storage temperature	-25°C to -60°C
Humidity	20 - 80% RH





>> P3000i Column Oven:

Column Oven	P3000i Column Oven (P/N: 102010000709)
Temperature Range	4°C below ambient to 100° C (in 0.1°C increments)
Temperature Accuracy	±0.1°C
Temperature Stability	+0.1°C of set temperature
Temperature Precision	±0.1°C
Column Length	300mm, upto four columns,50mm guard column
Display	4 digits
Power Consumption	100-120V, 60Hz; 200-240 V,50 Hz
Solvent Condition	pre heating
Column tracking	information management tracks and archives column usage history
Switching valve	Two nine port, eight position
Method	Peltier heating and cooling
Temperature regulation	up to 90° C

Software module for GPC/SEC (Gel Permeation/Size Exclusion Chromatography)

Gel Permeation Chromatography (GPC) / Size Exclusion Chromatography

(SEC) is the technique used for obtaining a rapid and reliable characterization of polymer molecular weight and molecular weight distribution.

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

The GPC Extension allows flow rate and multi-detectordelay corrections and includes Narrow Broad and Broadon Narrow calibrations.



GPC Extension is an optional part of ATL Software, it cannot be used as a standalone program.



ATL GPC Extension

Software module for Gel Permeation / Size Exclusion Chromatography (GPC/SEC)

The GPC Extension is an optional, fully integrated part of ATL software. It can be ordered as a part of new software or as an extension to existing software.

The ATL Chromatography Software is designed to acquire and evaluate data from up to four multidetector chromatographs at a time (four independent baselines). The



ATL Chromatography Station can acquire data from any HPLC system with standard analog output. GPC mode is selectable for any Instrument within a station. GPC Extension is compatible also with ATL Offline Software.

>> Specification

Data Acquisition:

Simultaneous data acquisition from up to four chromatographs, detector delay correction for multi-detector measurement.

• Data Processing:

The same chromatograms can be evaluated in both standard and GPC modes, multiple peaks and multiple signals are processed in one chromatogram.

• GPC Integration:

Separate integration tables for GPC and standard evaluation are used. There for modifying chromatograms. The chromatogram integration can be changed by entering global parameters or interactively, through the direct graphical modification of the baseline.

GPC Calibrations:

Narrow, Broad, Broad on Narrow standard calibration methods combined with Flow Rate correction and Universal calibration. Manual calibration or automated recalibration from sequence. Multiple Broad standards can be used.

• GPC Calculations:

Polynomial (n= 1-5) curve fits (independent for signals), Mp, Mn, Mw , Mv , Mz, Mz+1 molecular weight averages and polydispersity.

• Overlay:

Simultaneously displays a virtually unlimited number of chromatograms.Overlay of dW/d logM vs log M and cumulative height graphs.



• Export:

Slice Table results, graphs, result and summary tables.

User Calculations:

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

• GPC Results Table:

Displays molecular weight averages together with peak details for active signal. Multiple peaks can be evaluated from one chromatogram.

• GPC Summary Result Tables:

Displays and prints selected results from all simultaneously displayed chromatograms.

• Post Run:

Automatically displays, prints, exports and starts other programs after the completion of a measurement.

• Batch:

Automatically batch processes, displays, exports or prints any number of chromatograms.

• Reports:

User selectable report sections and WYSIWYG formatting of Graphs and Tables.

Future Upgradation:

System will upgradable to with online viscometer and light scattering detector (MALS) and any 3rd party detectors in the near future without any hardware and software changes.



Regulatory compliances



Corporate Social Responsibility

Analytical Foundation is a nonprofit organization (NGO) found for the purpose of:



1.Research & Innovation Scientist's awards/QC Professional Award : Quality life is possible by innovation only and the innovation is possible by research only, hence ANALYTICAL FOUNDATION is committed to identify such personallities for their contributions across various field of Science and Technology and awarding them yearly. To participate for award, send us your details of research / testing / publication at Info@analyticalfoundation.org

2. Improving quality of life by offering YOGA Training courses, Work shops/Seminars etc.

3. ANALYTICAL FOUNDATION aims to DETOXIFY human minds, souls and body by means of yoga, Meditation, Ayurveda, Health Care, Awards, Media, Events, Camps etc.

Reach us @





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