

# High Performance Liquid Chromatography

## HPLC2695-PDA-UV-Fluorescence



Brand: Waters/Jasco

Model: HPLC2695#1

- Waters alliance 2695 Separation module
- Waters 996 Photodiode Array Detector
- Waters 2487 Dual  $\lambda$  Absorbance Detector

HPLC2695#2

- Waters alliance 2695 Separation module
- Waters 2487 Dual  $\lambda$  Absorbance Detector
- Jasco FP-2020 Plus Intelligent Fluorescence Detector

Custodian: Sookruthai Wongsubin

Location: K637 Room, 6<sup>th</sup> Floor, Chaloeprakiet Building, Phyathai Campus

## HPLC 2695 Separation Module

### Solvent Delivery

Description	Specification
- Number of solvents	1 to 4 solvents
- Solvent conditioning	Vacuum degas, two operating modes, four chambers, <500 $\mu$ l Internal volume/chamber
- Programmable flow rate range	0.000 to 10.000 mL/min (0.050 to 5.000 mL/min typical) in 0.001 mL/min increments
- Compressibility compensation	Automatic and continuous
- System delay volume	<650 $\mu$ l independent of backpressure at 1 mL/min
- Plunger seal wash	Integral, active, programmable
- Gradient profiles	11 gradient curves (Including linear, step[2], concave [4], and convex [4])
- Dry prime/Wet prime	Automatic front panel control, System PREP function for automatic solvent(s) purge
- Pressure ripple	$\leq$ 2.5% (1 mL/min, degassed methanol, at 1700 psi backpressure)
- System pressure	-50 to 5000 psi (345 bar) (0.010 to 3.000 mL/min) programmable upper and lower limits
- Sample Temperature	4 to 40 $^{\circ}$ C
- Composition range	0.0 – 100.0 in 0.1% increments
- Composition accuracy	$\pm$ 0.5% absolute, independent of backpressure (proportioning valve pair test, [degassed methanol:methanol/propylparaben 2.0 mL/min. 254 nm])
- Composition precision	0.15% RSD or 0.02 min SD, whichever is greater, based on retention time (degassed methanol water 60:40 dial-a-mix, 1.00 mL/min, six replicates, phenone mix, 254 nm)
- Flow precision	0.075% RSD or 0.02 min SD, six replicates, based on retention time or volumetric measures (0.200 to 5.000 mL/min), isocratic premix
- Flow accuracy	$\pm$ 1% or 10 $\mu$ l/min, whichever is greater, 0.200 to 5.000 mL/min, (degassed methanol, at 600 psi backpressure)
- Flow ramping	Time (0.01 to 30.00 min in 0.01 min increments) to reach maximum flow rate
- Advanced operations	start run, auto additions, auto standards

## Sample Management

Description	Specification
- Number of sample vials	120 vials, configured in five carousels of 24 vials
- Number of sample injections	1 to 99 injections per sample vial
- Sample delivery precision	Typically < 0.59 RSD, 5 to 80 $\mu\text{L}$ (degassed methanol water 60:40 dIal-a-mix. 1 mL/min, six reallocates. phenone mix. 254 nm)
- Sample carryover	$\leq 0.01\%$ for caffeine. under specified conditions
- Injection needle wash	Integral, active, programmable
- Injection accuracy	$\pm 1 \mu\text{L}$ ( $\pm 2\%$ ) (50uL. N-6X sample: 100% degassed water, analytical solvent: 100% degassed methanol)
- Injection volume range	0.1-100 $\mu\text{L}$ standard; 0.1 to 2000.0 $\mu\text{L}$ , with optional sample loop
- Injector linearity	>0.999 coefficient of deviation (1 to 100 $\mu\text{L}$ )
- Standard sample vial	2 mL
- Advanced operations standards	Priority samples, auto additions, auto standards
- Minimum sample required	10 $\mu\text{L}$ . using low volume inserts
- Sample Temperature control	4 to 40 $^{\circ}\text{C}$ , programmable in 1 $^{\circ}\text{C}$ increments
- Column heater	20 to 65 $^{\circ}\text{C}$ , in 1 $^{\circ}\text{C}$ increments (5 $^{\circ}\text{C}$ above ambient to 65 $^{\circ}\text{C}$ )

## Detector

### 996 Photodiode Array Detector (PDA)

Description	Specification
Wavelength range	190 – 800 nm
Wavelength accuracy	±1 nm
Linearity range	5% over – 0.1 to 2.0 AU
Spectra resolution	1.2 nm per photodiode
Baseline noise	5x10 <sup>-5</sup> AU peak-to-peak at 254 nm
Drift	1x10 <sup>-3</sup> AU/hour at 254 nm (after warm-up)
Operating temperature	4 to 40 °C
Flow cells	Pathlength (mm)
- Standard	10

### 2487 Dual $\lambda$ Absorbance Detector (UV-VIS)

Description	Specification
Wavelength range	190 – 700 nm
Wavelength accuracy	+ 1 nm
Wavelength repeatability	+ 0.10 nm
Bandwidth	5 nm
Linearity range	5% over - 0.1 to 2.0 AU
Noise, signal wavelength	< ± 0.35 x 10 <sup>-5</sup> AU, dry cell, 254 nm, 1.0 sec. time constant (TC)
Noise, dual wavelength	< ± 0.25 x 10 <sup>-5</sup> AU, dry cell, 254 nm/280 nm, 2.0 sec. time constant (TC)
Drift	1.0 x 10 <sup>-4</sup> AU/hour/°C at 254 nm (after 1 hour warm up)
Linearity	5% at 2.5 AU, propyl paraben, 257 nm
Sensitivity setting range	0.0001 to 4.0000 AUFS
20Filter setting range	0.1 to 5.0 seconds (under software control)
Light source	Deuterium arc lamp
Flow cell	Taper Slit Flow Cell design
Path length	10 mm (standard, analytical)
Cell volume	10 $\mu$ L (standard, analytical)
Pressure limit	1000 psi / 70 bar
Operating temperature	4 to 40 °C

## Jasco FP-2020 Plus Intelligent Fluorescence Detector

Description	Specification
Optical system:	
Monochromator (for EX and EM wavelengths)	Holographic concave diffraction grating
Light source	150W Xenon lamp (mounted horizontally)
Wavelength range	220~700nm(for EX and EM wavelength)
Spectrum:	
Spectrum bandwidth	Excitation side 18 nm
Emission side	18 and 40 nm (two-step switching)
Wavelength accuracy	±2nm
Wavelength repeatability	±0.3nm
Detectors:	
Excitation side	Photodiode
Emission side	Photomultiplier
Flowcell capacity:	16ul
Solvent wetted materials	Synthetic quartz, fluoropolymer, and stainless steel SUS-316
Control system:	
Sensitivity	S/N for the Raman peak of water: Standard flowcell (16ul) 350 or greater micro flowcell (5ul) 150 or greater Where EX=350nm and the response is standard
Measurement range	10 steps in total 1,2,4,8,16,32,64,128,256 and S
Gain	X1000, x100, x10, and x1
Response	Fast, standard, slow, and digital filter methods
Signal processing	Digital processing by A/D and D/A converters (having ambient temperature compensation circuits)
Output	Record output:10mV/FS(polarity change is possible) Integrator output:1V/FS Marker output and leak output:1circuit each
Input	Marker input, autozero input and Program reset run input:1circuit each
Program functions	Time programmability for EX wavelength, EM wavelength, Gain, attenuation, wavelength scan, etc.
Wavelength scan functions	Excitation spectrum and emission spectrum measurement (manual and time program) Spectrum storage (10 excitation spectra and 10 emission spectra) and spectrum output (difference spectrum)

Description	Specification
Diagnostic test function	Memory (ROM and RAM), DC power, EX energy decrease, cell leak, and lamp use time
Lamp of timer	99.9-hour maximum
Lamp use time calculation function	Internal timer for recording the total number of hours that the Xe lamp has been used
Calibration function	EX and EM wavelength calibration
Dimensions and weight	300(W)X470(D)X150(H) mm, approx.19 kg
Rated power	AC100~240V ±10V%, 50/60Hz, 425 VA
	+10~+35°C during operation
	-30~+60°C during storage