

Performance Specifications

Performance Specifications (G1311B)

Table 4 Performance Specification Agilent 1260 Infinity Quaternary Pump (G1311B)

Type	Specification
Hydraulic system	Dual piston in series pump with proprietary servo-controlled variable stroke drive, floating pistons
Setable flow range	0.001 – 10 mL/min, in 0.001 mL/min increments
Flow range	0.2 – 10.0 mL/min
Flow precision	< 0.07 % RSD, or < 0.02 min SD whatever is greater, based on retention time at constant room temperature
Flow accuracy	± 1 % or 10 µL/min whatever is greater, pumping degassed H ₂ O at 10 MPa
Pressure	Operating range 0 – 60 MPa (0 – 600 bar, 0 – 8700 psi) up to 5 mL/min Operating range 0 – 20 MPa (0 – 200 bar, 0 – 2950 psi) up to 10 mL/min
Pressure pulsation	< 2 % amplitude (typically < 1.3 %), or < 3 bar at 1 mL/min isopropanol, at all pressures > 10 bar (147 psi)
Compressibility compensation	User-selectable, based on mobile phase compressibility
Recommended pH range	1.0 – 12.5, solvents with pH < 2.3 should not contain acids which attack stainless steel
Gradient formation	Low pressure quaternary mixing/gradient capability using proprietary high-speed proportioning valve
Delay volume	600 – 800 µL, dependent on back pressure
Composition range	0 – 95 % or 5 – 100 %, user selectable
Composition precision	< 0.2 % RSD, or < 0.04 min SD whatever is greater, at 0.2 and 1 mL/min
Control and data evaluation	Agilent control software

Table 4 Performance Specification Agilent 1260 Infinity Quaternary Pump (G1311B)

Analog output	For pressure monitoring, 1.33 mV/bar, one output
Communications	Controller-area network (CAN), RS-232C, APG Remote: ready, start, stop and shut-down signals, LAN optional

Performance Specifications (G1316A)

Table 5 Performance Specifications Thermostatted Column Compartment

Type	Specification	Comments
Temperature range	10 degrees below ambient to 80 °C up to 80 °C: flow rates up to 5 mL/min	
Temperature stability	± 0.15 °C	
Temperature accuracy	± 0.8 °C ± 0.5 °C	With calibration
Column capacity	Three 30 cm	
Warm-up/cool-down time	5 minutes from ambient to 40 °C 10 minutes from 40 – 20 °C	
Dead volume	3 µL left heat exchanger 6 µL right heat exchanger	
Communications	Controller-area network (CAN), RS-232C, APG Remote: ready, start, stop and shut-down signals, LAN via other 1260 Infinity module	
Safety and maintenance	Extensive diagnostics, error detection and display (through Instant Pilot and Agilent data system), leak detection, safe leak handling, leak output signal for shutdown of pumping system. Low voltages in major maintenance areas.	
GLP features	Column-identification module for GLP documentation of column type.	
Housing	All materials recyclable	

Performance Specifications (G1329B)

Table 6 Performance Specifications Agilent 1260 Infinity Standard Autosampler (G1329B)

Type	Specification
Pressure	Operating range 0 - 60 MPa (0 - 600 bar, 0 - 8850 psi)
GLP features	Early maintenance feedback (EMF), electronic records of maintenance and errors
Communications	Controller-area network (CAN), GPIB (IEEE-448), RS232C, APG-remote standard, optional four external contact closures and BCD vial number output
Safety features	Leak detection and safe leak handling, low voltages in maintenance areas, error detection and display
Injection range	0.1 - 100 μ L in 0.1 μ L increments (recommended 1 μ L increments) Up to 1500 μ L with multiple draw (hardware modification required)
Replicate injections	1 – 99 from one vial
Precision	Typically < 0.25 % RSD of peak areas from 5 - 100 μ L, Typically < 1 % RSD of peak areas from 1 - 5 μ L,
Minimum sample volume	1 μ L from 5 μ L sample in 100 μ L microvial, or 1 μ L from 10 μ L sample in 300 μ L microvial
Carryover	Typically < 0.1 %, < 0.05 % with external needle cleaning
Sample viscosity range	0.2 – 50 cp
Sample capacity	100 \times 2 mL vials in 1 tray 40 \times 2 mL vials in 1/2 tray 15 \times 6 mL vials in 1/2 tray (Agilent vials only)
Injection cycle time	50 s for draw speed 200 μ L/min, ejection speed 200 μ L/min, injection volume 5 μ L

Performance Specifications (G4212B)

Table 7 Performance Specifications G4212B

Type	Specification	Comments
Detection type	1024-element photodiode array	
Light source	Deuterium lamp	Equipped with RFID tag that holds lamp typical information.
Wavelength range	190 – 640 nm	
Short term noise (ASTM) Single and Multi-Wavelength	$< \pm 3 \times 10^{-6}$ AU at 230 nm/4 nm	see "Specification Conditions" below
Drift	$< 0.5 \times 10^{-3}$ AU/hr at 230 nm	see "Specification Conditions" below
Linear absorbance range	> 2.0 AU (5 %) at 265 nm	see "Specification Conditions" below
Wavelength accuracy	± 1 nm	After recalibration with deuterium lines
Wavelength bunching	2 – 400 nm	Programmable in steps of 1 nm
Slit width	G4212B: 4 nm	Fixed slit
Diode width	~ 0.5 nm	
Signal data rate	80 Hz (G4212B)	
Spectra Data rate	80 Hz (G4212B)	
Flow cells	Max-Light Cartridge Cell (10 mm, V(σ) 1.0 μ l), 60 bar (870 psi) pressure maximum Max-Light Cartridge Cell (60 mm), V(σ) 4.0 μ L), 60 bar (870 psi) pressure maximum Max-Light Cartridge Test Cell	pH range 1.0 —12.5 (solvent dependent) Cartridge type, equipped with RFID tags that holds cell typical information.
Control and data evaluation	Data System 1 Agilent ChemStation for LC 2 EZChrom Elite 3 MassHunter	For G4212B: 1 B.04.02 DSP3 or above 2 3.3.2 SP2 or above 3 B.04.00 and B.03.01 SP2 or above
Local Control	Agilent Instant Pilot (G4208A)	B.02.11 or above
Test and diagnostic software	Agilent LabAdvisor	B.01.03 SP4 or above
Analog outputs	Recorder/integrator: 100 mV or 1 V, output range 0.001 – 2 AU, one output	

2 Specifications

Performance Specifications

Table 7 Performance Specifications G4212B

Type	Specification	Comments
Communications	Controller-area network (CAN), RS-232C, APG Remote: ready, start, stop and shut-down signals, LAN	
Safety and maintenance	Extensive diagnostics, error detection and display (through control module and ChemStation), leak detection, safe leak handling, leak output signal for shutdown of pumping system. Low voltages in major maintenance areas.	
GLP features	Early maintenance feedback (EMF) for continuous tracking of instrument usage in terms of lamp burn time with user-settable limits and feedback messages. Electronic records of maintenance and errors. Verification of wavelength accuracy with the emission lines of the deuterium lamp.	
Housing	All materials recyclable.	

Performance Specifications (G1314F)

Table 8 Performance Specifications G1314F

Type	Specification	Comments
Detection type	Double-beam photometer	
Light source	Deuterium lamp	
Wavelength range	190 – 600 nm	The UV-lamp is equipped with RFID tag that holds lamp typical information.
Short term noise	$\pm 0.25 \cdot 10^{-5}$ AU at 230 nm (G1314F)	Under specified conditions. See “Specification Conditions (VWD)” on page 48 below the table.
Drift	$< 1 \cdot 10^{-4}$ AU/h at 230 nm	Under specified conditions. See “Specification Conditions (VWD)” on page 48 below the table.

Performance Specifications

Table 2 Performance specifications Agilent 1290 Infinity Thermostat

Type	Specification
Temperature range	Settable from 4 °C to 40 °C in 1 ° increments
Temperature accuracy at ambient temperatures < 25 °C and humidity < 50 %	3 °C to 8 °C at a setpoint of 4 °C*
Temperature accuracy at ambient temperatures <30 °C and humidity <60 %	3 °C to 9 °C at a setpoint of 4 °C*

* Measurement conditions:

G1329B:

with 100-Vial Tray in vial location 2,10,92 and 100 vials filled with water

G1367A/G1367B/G1367C/G1377A/G1367E/G5667A/G2258A/G4226A:

For vials: Using the Thermostatable Tray (G1329-60011) or 100 Micro-Vial (G4226-60021), both loaded with 100 vials. Temperature is measured in vial locations 1,10,23,25,45,75,91 and 100 (filled with 1 mL of water)

For well plates: Standard Tray (G2258-60011) for two Well Plates loaded with two Agilent 96 Well Plate (5042-1386)

Specifications

Table 2 Performance Specifications (G1367E)

Type	Specification	Comment
Injection range	0.1 – 100 µL in 0.1 µL increments. Up to 40 µL with reduced injection volume kit (hardware modification required). Up to 1500 µL with multiple draw (hardware modification required).	
Precision	<0.25 % from 5 – 40 µL <0.5 % from 2 – 5 µL <0.7 % from 1 – 2 µL <1.5 % from 0.5 – 1 µL	
Injection Accuracy	1 % (10 µL, n=10)	
Pressure range	Up to 600 bar (8700 psi)	
Sample viscosity range	0.2 – 5 cp	
Sample capacity	Capacity 2 x well plates (MTP) + 10 x 2 ml vials, 108 x 2 ml vials in 2 x 54 vial plate plus 10 additional 2 ml vials, 30 x 6 ml vials in 2 x 15 vial plate, 100 Micro vial tray, plus 10 additional 2 ml vials, 54 Eppendorf tubes (0.5/1.5/2 ml) in 2 x 27 Eppendorf tube plate.	Also compatible with the Agilent 1200 Series sample capacity extension for further expansion of the sample capacity.
Injection cycle time	Typically <21 s using default conditions and injection volume of 5 µL	
Carry Over	Typically <0.004 %	For measurement conditions see ^{1, 2, 3}
Control and data evaluation	Agilent ChemStation for LC EZChrom Elite MassHunter TOF/QTOF and QQQ	B.04.02 SP1 DSP3 or above 3.3.2 SP2 or above B.04.00 or above B.03.01 SP2 or above

Table 2 Performance Specifications (G1367E)

Type	Specification	Comment
Local Control	Agilent Instant Pilot (G4208A)	B.02.11 or above
Communications	Controller-area network (CAN), RS-232C, APG Remote: ready, start, stop and shut-down signals, optional four external contact closures and BCD vial number out.	
Safety and maintenance	Extensive support for troubleshooting and maintenance is provided by the Instant Pilot, Agilent Lab Advisor, and the Chromatography Data System. Safety-related features are leak detection, safe leak handling, leak output signal for shutdown of pumping system, and low voltages in major maintenance areas.	
GLP features	Early maintenance feedback (EMF) for continuous tracking of instrument usage with user-settable limits and feedback messages. Electronic records of maintenance and errors.	
Housing	All materials recyclable.	
Metering device	Metering pump in high pressure flow path	

- ¹ Chromatographic conditions: Column: Agilent ZORBAX SB-C18, 2.1 x 50 mm 1.8 μ m (p/n 827700-902); mobile phase: A: 0.1 % TFA in water, B: 0.1 % TFA in acetonitrile; isocratic : %B=35 %; flow rate: 0.5 mL/min; temperature: 30 °C
- ² UV-detection: Sample : 1200 ng/ μ L chlorhexidine (dissolved in mobile phase A), 1 μ L injected and measured on G4212A DAD (10 mm cell); Wavelength: 257 nm +/- 4 nm; ref. 360 nm +/- 16 nm; slit 4 nm, 10 Hz
- ³ MS-detection: Sample : 50 ng/ μ L chlorhexidine (dissolved in mobile phase A), 1 μ L injected and measured on Agilent 6460 QQQ (in specified conditions); MRM 1: 505.5 \rightarrow 170 (CE: 36 V); MRM 3: 505.5 \rightarrow 201.2 (CE: 20 V); fragmentor: 150 V, delta EMV(+): 200 V