



# Agilent 1290 Infinity LC System

## Specifications



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The Agilent 1290 Infinity LC system is designed to provide highest speed, resolution and sensitivity. A new power range allows you to deploy any particle type, any column dimensions, or any mobile and stationary phases. Innovative technology components offer the next level of performance for both UHPLC and HPLC applications. The Agilent 1290 Infinity LC is the first system that provides the foundation for method transfer to or from any Agilent or non-Agilent UHPLC or HPLC system.

In short, the Agilent 1290 Infinity LC system gives you infinite capabilities to solve all your analytical challenges in LC and LC/MS.

This document provides detailed physical specification and performance specification for the following Agilent 1290 Infinity LC modules:

- Agilent 1290 Infinity Binary Pump
- Agilent 1290 Infinity Autosampler
- Agilent 1290 Infinity Thermostatted Column Compartment
- Agilent 1290 Infinity Diode Array Detector

# Agilent 1290 Infinity Binary Pump G4220A

## Physical specifications

Type	Specifications	Comments
Weight	21.8 kg (48 lbs)	
Dimensions (height x width x depth)	240 x 345 x 435 mm (9.3 x 13.5 x 17 inches)	
Line voltage	100 – 240 VAC, ± 10 %	Wide-ranging capability
Line frequency	50 or 60 Hz, ± 5%	
Power consumption (apparent power) Maximum	350 VA	
Power consumption (active power)	270 W	Maximum
Ambient operating temperature	4–55 °C (39–131 °F)	
Ambient non-operating temperature	-40–70 °C (-40–158 °F)	
Humidity	< 95 %, at 25–40 °C (77–104 °F)	Non-condensing
Operating altitude	Up to 2000 m (6562 ft)	
Non-operating altitude	Up to 4600 m (15091 ft)	For storing the module

## Performance specifications

Type	Specifications	Comments
Hydraulic system	Two dual pistons in series pumps with proprietary servo-controlled variable stroke design and smooth motion control.	High pressure mixing concept
Settable flow range	0.001 – 5 mL/min, in 0.001 mL/min increments	Executed in 300pL/step increments
Flow precision	0.07 % RSD or 0.005 min SD, whatever is greater (0.2-5.0 mL/min)	Based on retention time at constant room temperature.
Flow accuracy	±1% or 10 µL/min, whatever is greater.	Measured with water
Maximum operating pressure	1200 bar up to 2 ml/min 800 bar up to 5 ml/min	
Pressure pulsation	<1 % amplitude, or <5 bar whatever is greater	At 1 mL/min water
Compressibility compensation	Automatic, pre-defined, based on mobile phase selection.	LabAdvisor will support calibrating own specific solvent mixtures
pH-range	1.0 – 12.5	Solvents with pH <2.3 should not contain acid which attack stainless steel.
Gradient formation	High pressure binary mixing	
Delay volume	JetWeaver V35: <40 µL JetWeaver V100: <75 µL	The use of the JetWeaver is recommended. For certain applications even lower delay volumes are possible without JetWeaver. Then the delay volume is determined by the volume of the connecting capillary.
Composition range	Settable range: 0.0 – 100.0 %	Recommended range: 1 – 99 % or 5 µL/min per channel, whatever is greater.
Composition precision	<0.15 % RSD, or 0.01 min SD whatever is greater (from 0.2– 5 mL/min)	Based on retention time at constant room temperature
Composition accuracy	±0.35 % absolute from 5-95 %, from 0.2-5.0 mL/min	Water/Water+caffeine tracer
Solvent selection valve	Yes	Standard part of the pump

Type	Specifications	Comments
<b>Integrated Degassing Unit:</b>		
Number of channels	2	
Internal volume per channel	1.5 mL	
Materials in contact with solvent	Teflon AF, FEP, PPS	
Control	Agilent ChemStation for LC EZChrom Elite OpenLAB Masshunter	B.04.02 or above 3.3.2 SP1 or above 3.3.2 SP3 B.02.01 SP1 or above
Local control	Agilent Instant Pilot (G4208A)	B.02.08 or above
Communications	Controller-area network (CAN), RS232C, APG remote: ready, start, stop and shutdown signals, LAN	
Safety and maintenance	Extensive diagnostics, error detection and display through Agilent Lab Advisor, leak detec- tion, safe leak handling, leak output signal for shutdown of the pumping system. Low voltage in major maintenance areas.	
GLP features	Early maintenance feedback (EMF) for continuous tracking of instrument usage in terms of seal wear and volume of pumped mobile phase with pre-defined and user settable limits and feedback messages. Electronic records of maintenance and errors.	
Housing	All materials recyclable.	



# Agilent 1290 Infinity Autosampler G4226A

## Physical specifications

Type	Specifications	Comments
Weight	15.5 kg (34.2 lbs)	
Dimensions (height x width x depth)	200 x 345 x 440 mm (8 x 13.5 x 17 inches)	
Line voltage	100 – 240 VAC, ± 10 %	Wide-ranging capability
Line frequency	50 or 60 Hz, ± 5 %	
Power consumption (apparent power)	300 VA	Maximum
Power consumption (active power)	200 W	Maximum
Ambient operating temperature	4–55 °C (39–131 °F)	
Ambient non-operating temperature	-40–70 °C (-40–158 °F)	
Humidity	< 95 %, at 25–40 °C (77–104 °F)	Non-condensing
Operating altitude	Up to 2000 m (6562 ft)	
Non-operating altitude	Up to 4600 m (15091 ft)	For storing the modules

## Performance specifications

Type	Specifications	Comments
Injection range	0.1 – 20 µL 0.1 – 40 µL in 0.1 µL increments	With standard loop With extended loop
Precision	Typically < 0.25 % RSD from 5 – 20 µL, Typically < 0.5 % RSD from 2 – 5 µL volume, Typically < 0.7 % RSD from 1 – 2 µL volume	Measured with injections of benzyl alcohol.
Accuracy	± 1 % (10 µL, n-10)	
Pressure range	Up to 1200 bar	
Cooling/Thermostating	Compatible with G1330B Autosampler Thermostat, 4-40°C	
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, plus 10 additional 2 mL vials, 54 Eppendorf tubes (0.5/1.5/2.0 mL) in 2 x 27 Eppendorf tube plate	
Injection cycle time	Typically < 19 s without needle wash and typically < 25 s with 3 s needle wash; conditions: default draw (100 µL/min) and eject speed (400 µL/min). Injection volume < 5 µL (water)	
Carry Over, flow through design	Typically < 0.004 %	Using the following conditions: Column: Agilent ZORBAX SB-C18, 2.1 x 50 mm 1.8 (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: 25 °C Wavelength: 257 nm Sample : 1200 ng/µL Chlorhexidine for UV, 240 ng/µL Chlorhexidine for MS (dissolved with mobile phase A), 1 µL injected and measured both on Agilent 6410 QQQ and G4212A DAD Wash solution: H <sub>2</sub> O with 0.1% TFA (5 sec)
µm		

Type	Specifications	Comments
Hydraulic volume	80 µL	0.2 mm inner diameter loop capillary (standard loop)
Control and data evaluation	Agilent ChemStation for LC EZChrom Elite OpenLAB MassHunter	B.04.02 or above 3.3.2 SP1 or above 3.3.2 SP 3 B.02.01 SP1 or above
Local control	Agilent Instant Pilot (G4208A)	B.02.08 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 diagnostics, error detection and display through control module and Agilent Lab Advisor, 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 with user-settable limits and feedback messages. Electronic records of maintenance and errors.	
Housing	All materials recyclable.	



# Agilent 1290 Infinity Thermostatted Column Compartment G1316C

## Physical specifications

Type	Specifications	Comments
Weight	11.2 kg (24.7 lbs)	
Dimensions (height x width x depth)	140 x 345 x 435 mm (5.5 x 13.5 x 17 inches)	
Line voltage	100 – 240 VAC, ± 10 %	Wide-ranging capability
Line frequency	50 or 60 Hz, ± 5 %	
Power consumption	320 VA / 150W / 512 BTU	Maximum
Ambient operating temperature	0–55 °C (32–131 °F)	
Ambient non-operating temperature	-40–70 °C (-40–158 °F)	
Humidity	< 95 %, at 25–40 °C (77–104 °F)	Non-condensing
Operating Altitude	Up to 2000 m (6562 ft)	
Non-operating altitude	Up to 4600 m (15091 ft)	For storing the module
Safety standards: IEC, CSA, UL	Installation Category II, Pollution Degree 2	For indoor use only. Research Use Only. Not for use in Diagnostic Procedures.

## Performance specifications

Type	Specifications	Comments
Temperature range	10 °C below ambient to 80 °C (5 mL/min) 10 °C below ambient to 100 °C (2.5 mL/min)	
Temperature stability	± 0.05 °C	
Temperature accuracy	± 0.8 °C ± 0.5 °C	With calibration
Column capacity	<ul style="list-style-type: none"> <li>• 2 columns of 300 mm length with individual solvent heating</li> <li>• 3 columns of 300 mm length in series</li> <li>• 4 columns of 100 mm length with opt. Low dispersion heat exchanger</li> <li>• 6 columns (max. 300 mm) with triple-TCC clustering and column selection valves</li> <li>• 8 columns (max. 100 mm) with dual-TCC clustering and column selection valves</li> </ul>	Up to three 1290 Infinity TCCs can be clustered in a system. These will appear with a single joint user interface in the control software.*
Warm-up/cool-down time	5 min from ambient to 40 °C 10 min from 40 – 20 °C	
Temperature zones	<ul style="list-style-type: none"> <li>• 2 (single TCC)</li> <li>• 4 (dual-TCC cluster)</li> <li>• 6 (triple-TCC cluster)</li> </ul> Individual standby temperatures definable for cluster configurations.	
Dead volume	<ul style="list-style-type: none"> <li>• 1.6 µL low dispersion heat exchanger</li> <li>• 3 µL left heat exchanger</li> <li>• 6 µL right heat exchanger</li> </ul>	The use of low dispersion heat exchangers is recommended. 3 µL and 6 µL heat exchanges are available for backwards compatibility.
Available valves	<ul style="list-style-type: none"> <li>• 8 position / 9 port, 8x column selection valve, min. 2 1290 Infinity TCCs required, (G4230A 400 bar, (G4230B 1200 bar)</li> <li>• 2 position / 6 port (G4231B), 1200 bar</li> <li>• 2 position /10 port (G4232B), 1200 bar</li> </ul>	The optional valve drive (G1316C #058) needs to be present. Valve kits have to be ordered as separate products.

Type	Specifications	Comments
Control and Data evaluation:	Agilent ChemStation for LC EZChrom Elite OpenLAB Masshunter	B.04.02 or above* 3.3.2 SP1 or above* 3.3.2 SP3* B.02.01 SP1 or above*
Local Control:	Agilent Instant Pilot (G4208A)	B.02.08 or above*
Communications	Controller-area network (CAN), RS-232C, APG Remote: ready, start, stop and shut-down signals, LAN via other modules	
Safety and maintenance	Extensive diagnostics, error detection and display through control module and Agilent Lab Advisor, 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, see "Column-Identification System" on page 13 of the G1316C user manual (PN G1316-90030). Valves carrying RFID-tags with serial number, pressure rating, number of switches and valve type. Door-open sensor.	
Housing	All materials recyclable.	

Note : All specifications are valid for distilled water at ambient temperature (25 °C), set point at 40 °C and a flow range from 0.2–5 mL/min.

\* For support of multi-TCC clustering check for the availability of a cluster-driver for your chromatographic data system.



# Agilent 1290 Infinity Diode Array Detector G4212A

## Physical specifications

Type	Specifications	Comments
Weight	11.5 kg (26 lbs)	
Dimensions (height x width x depth)	140 x 345 x 435 mm (5.5 x 13.5 x 17 inches)	
Line voltage	100 – 240 VAC, ± 10 %	Wide-ranging capability
Line frequency	50 or 60 Hz, ± 5 %	
Power consumption	160 VA / 130 W / 444 BTU	Maximum
Ambient operating temperature	5-40 °C (41–104 °F)	
Ambient non-operating temperature	-40–70 °C (-40–158 °F)	
Humidity	Operating < 80 %	Non-condensing
Operating altitude	Up to 2000 m (6562 ft)	
Non-operating altitude	Up to 4600 m (15091 ft)	For storing the module

## Performance specifications

Type	Specifications	Comments
Detection type	1024-element photodiode array	
Light source	UV-lamp	Equipped with RFID tag that holds lamp typical information.
Wavelength range	190 – 640 nm	
Short term noise (ASTM) Single and Multi-Wavelength	< ± 3 x 10 <sup>-6</sup> AU at 230/4 nm, slit width 4 nm, TC 2 s ASTM	See details** below
Drift	< 0.5 x 10 <sup>-3</sup> AU/hr at 230 nm	See details** below
Linear absorbance range	> 2.0 AU (5 %) at 265 nm Typically 2.5 AU (5 %)	See details** below
Wavelength accuracy	± 1 nm	After recalibration with deuterium lines
Wavelength bunching	2 – 400 nm	Programmable in steps of 1 nm
Number of signals	8	
Slit width	1, 2, 4, 8 nm	Programmable slit
Diode width	~ 0.5 nm	
Signal data rate	up to 160 Hz	
Spectra Data rate	up to 160 Hz	
Flow cells	Max-Light Cartridge Cell (10 mm, V(±) 1.0 µL), 60 bar (870 psi) pressure maximum Max-Light Cartridge Cell (60 mm, V(σ) 4.0 µL), 60 bar (870 psi) Max-Light Cartridge Test Cell	Cartridge type, equipped with RFID tags that holds cell information.
Control and data evaluation	Agilent ChemStation for LC EZChrom Elite OpenLAB Masshunter	B.04.02 or above 3.3.2 or above 3.3.2 SP3 B.02.01 SP1 or above
Local Control	Agilent Instant Pilot (G4208A)	B.02.08 or above
Analog output:	Recorder/integrator: 100 mV or 1 V, output range 0.001 – 2 AU, one output	
Communications	Controller-area network (CAN), RS-232C, APG Remote: ready, start, stop and shut-down signals, LAN	

Type	Specifications	Comments
Safety and maintenance	Extensive diagnostics, error detection and display (through control module and Agilent Lab Advisor), 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 built-in holmium oxide filter.	
Housing	All materials recyclable.	

**\*\*Details:** Specification conditions and calculation (noise, drift) according to ASTM: "Standard Practice for Variable Wavelength Photometric Detectors Used in Liquid Chromatography".

Conditions:  
 Cell: Max-Light Cartridge Cell (10 mm, V(±) 1.0 µL) or Max-Light Cartridge Test Cell,  
 Settings: Wavelength 230 nm (or other if advised) with Bandwidth 4 nm and Slit Width 4 nm with Reference Wavelength 360 nm / 100 nm; Flow: 0.5 mL/min LC-grade water.  
 Time constant 2 sec

Linearity:  
 Linearity is measured with caffeine at 265 nm with slit width 4 nm and RT 2 s.

**Note:** The specifications are based on the standard RFID tag lamp (5190-0917) and may be not achieved when other lamp types or aged lamps are used. ASTM drift tests require a temperature change below 2 °C/hour (3.6 F/hour) over one hour period. Our published drift specification is based on these conditions. Larger ambient temperature changes will result in larger drift. Better drift performance depends on better control of the temperature fluctuations. To realize the highest performance, minimize the frequency and the amplitude of the temperature changes to below 1 °C/hour (1.8 F/hour). Turbulences around one minute or less can be ignored. Performance tests should be done with a completely warmed up optical unit (> two hours). ASTM measurements require that the detector should be turned on at least 24 h before start of testing.



## Notes

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**[www.agilent.com/chem/1290](http://www.agilent.com/chem/1290)**

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