Agilent 1260 Infinity Diode Array Detector

Features, Technical Details, Specifications and Ordering Details

10 x higher sensitivity for HPLC and RRLC

The Agilent 1260 Infinity Diode Array Detector (DAD) features a completely new optical design based on the Agilent Max-Light cartridge cell with optofluidic waveguides. With typical detector noise levels of <± 0.6 µAU/cm the revolutionary 6 cm flow cell gives up to 10 times higher sensitivity than the Agilent 1200 Series DAD and VWD detectors. Any compromising refractive index and thermal effects are almost completely eliminated, resulting in significantly less baseline drift for more reliable and precise peak integration. Multiple wavelength and full spectral detection with up to 80 Hz data rates allows precise identification, quantification and purity analysis at trace levels for ultra-fast LC separations.

Features

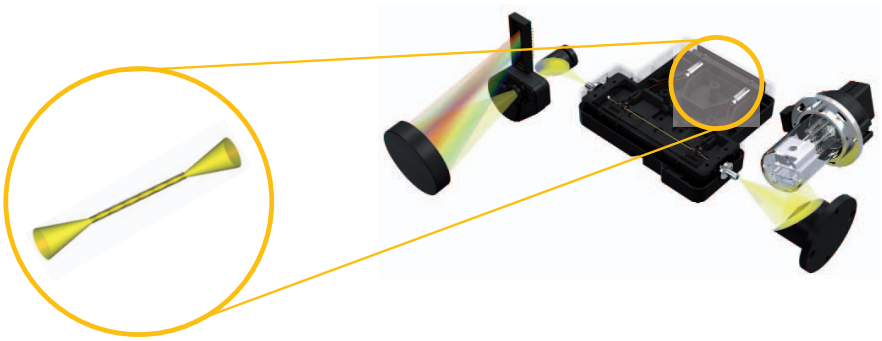
- Ultra sensitivity through revolutionary Agilent Max-Light cartridge cell with 60 mm optical path length (typically noise: <± 0.6 µAU/cm).
- Universal Agilent Max-Light cartridge standard cell with 10 mm optical path length provides high sensitivity (noise: <± 3 µAU) and lowest peak dispersion for 2.1, 3 and 4.6 mm ID columns.
- Wide linear range (typically up to 2.5 AU) - for reliable, simultaneous quantification of primary compounds, by-products and impurities.
- More reliable and robust peak integration process due through less baseline drift.
- Full spectral detection up to 80 Hz for compound identification by spectral libraries or verification of the separation quality with peak purity analysis for conventional and ultrafast LC. Simultaneous detection of up to 8 signals for increased sensitivity and selectivity.
- Radio frequency identification (RFID) tags for all flow cells and UV lamp provide new levels of data traceability by recording parameters such as cell dimensions, lamp usage, serial number etc.
- Electronic temperature control (ETC) provides maximum baseline stability and practical sensitivity under fluctuating ambient temperature and humidity conditions.
- Reference wavelength for elimination of background interference
- Early maintenance feedback (EMF) for continuous tracking of instrument usage in terms of lamp burn time with user-settable limits and feedback messages
- Extensive diagnostics, error detection and display with Instant Pilot controller and Agilent Lab Advisor software.

Agilent Technologies

Technical Details – Agilent 1260 Infinity Diode Array Detector

Optofluidic waveguides technology

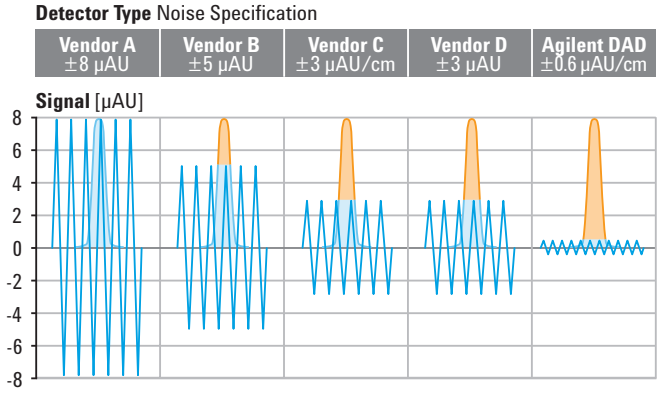
The new optical design of the 1260 Infinity DAD is based on the Agilent Max-Light cartridge cell with optofluidic waveguides. This new cell technology increases dramatically the light transmission by utilizing the principle of total internal reflection in a non-coated fused silica fiber, without sacrificing resolution caused by cell dispersions effects.



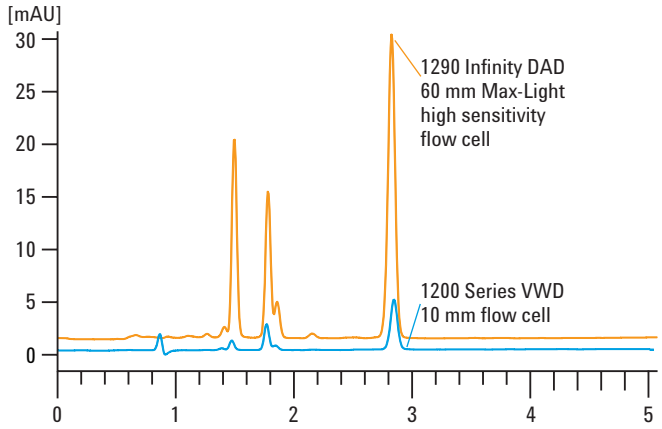
Optofluidic waveguides – Agilent Max-Light cartridge cells utilize total internal reflection in non-coated fused silica fiber. The cartridge design facilitate easy exchange of flow cells.

Ultra UV sensitivity

The 1260 Infinity DAD with the revolutionary Max-Light cartridge cell with 60 mm path length is by far the most sensitive UV-detector in world - lets you discover what you have not seen before. With typical detector noise levels of less than ±0.6 ÌAU/cm this revolutionary flow cell gives you up to 10 times higher sensitivity than the 1200 Series DAD or VWD.



Comparison of DAD noise specifications from different vendors

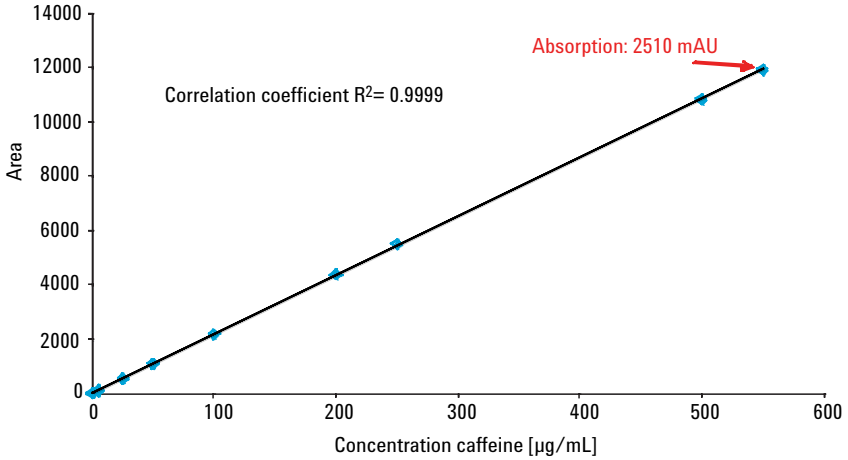


	1290 Infinity DAD 60 mm cell	1200 Series DAD 10 mm cell	1100 Series VWD 10 mm cell
Height [mAU]	28.88	4.938	4.800
Noise [µAU]	9.806	19.08	18.94
Signal/noise	2944	259	253

Comparison of signal to noise ratios for anthracene with different UV-detectors. The 1260 Infinity DAD delivers 11 times higher sensitivity than the 1200 Series DAD and VWD..

Wide linear range

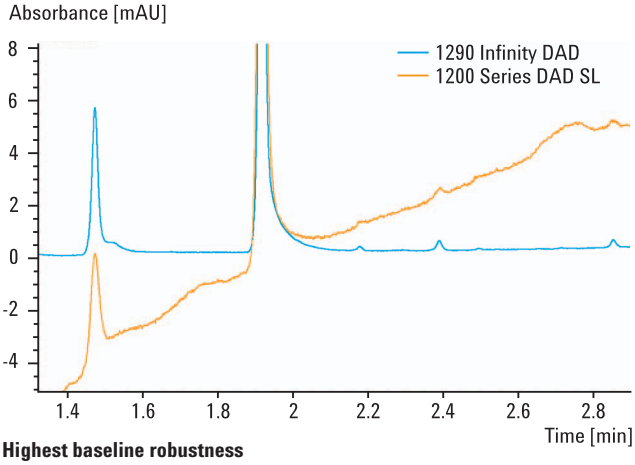
With a typical linear range of up to 2.5 AU the 1260 Infinity DAD allows the reliable, simultaneous quantification of primary compounds, by-products and impurities.



Detector linearity of up to 2.5 AU demonstrated by linearity plot of different caffeine concentrations.

Highest baseline robustness

The optofluidic waveguides in the Max-Light cartridge cells eliminates almost any compromising refractive index and thermal effects, resulting in significantly less baseline drift for more reliable and precise peak integration



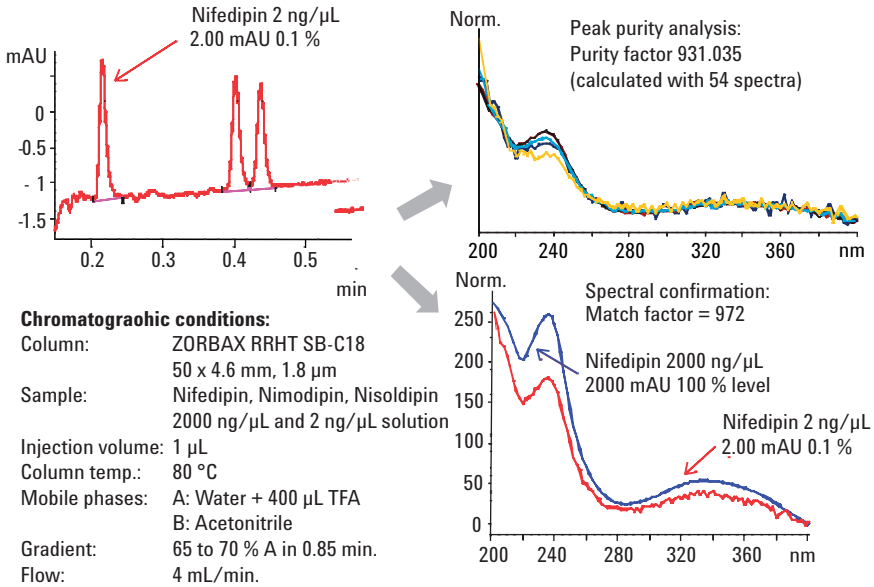
Highest baseline robustness

Column:	ZORBAX RRHT SB-C18, 2.1 x 50 mm, 1.8 µm	Elution:	5-95 %B over 3 min
		Flow:	0.5 mL/min
Mobile phase:	A: Water	Temperature:	80 °C
	B: Acetonitrile	Detection:	254/4 (360/80) nm, 40 Hz

Highest baseline robustness through significantly reduced refractive index effects.

Spectral confirmation and purity analysis

The spectral analysis of 54 spectra within the first peak confirms the purity at trace levels (<0.1 %) and under ultra-fast conditions. A library search identifies the peak as nifedipin with a match factor of 972. This positive spectral confirmation significantly enhances confidence in qualitative results



Chromatograohic conditions:

Column:	ZORBAX RRHT SB-C18 50 x 4.6 mm, 1.8 µm
Sample:	Nifedipin, Nimodipin, Nisoldipin 2000 ng/µL and 2 ng/µL solution
Injection volume:	1 µL
Column temp.:	80 °C
Mobile phases:	A: Water + 400 µL TFA B: Acetonitrile
Gradient:	65 to 70 % A in 0.85 min.
Flow:	4 mL/min.
DAD:	80 Hz, 245/4 nm, Ref. 450/80, slit 8 nm, all spectra

Specifications – Agilent 1260 Infinity Diode Array Detector

Specifications: Agilent 1260 Infinity Diode-Array Detector (G4212B)	
Detector type	1024-element diode array
Light source	Deuterium
Number of signals	8
Maximum sampling rate	80 Hz (both spectra and signals)
Short-term noise	$< \pm 3 \times 10^{-6}$ AU at 230/4 nm, slit width 4 nm, TC 2 sec, ASTM with 10 mm Max-Light cartridge cell Typically $<\pm$ 0.6 x 10^{-6} AU/cm at 230/4 nm, slit width 4 nm, TC 2 sec, ASTM with 60 mm Max-Light cartridge cell
Drift	$< 0.5 \times 10^{-3}$ AU/hr at 230 nm
Linearity	> 2.0 AU (5 %) at 265 nm Typically 2.5 AU (5 %)
Wavelength range	190-640 nm
Wavelength accuracy	± 1 nm, self-calibration with deuterium lines
Slit width	4 nm (fixed)
Diode width	~ 0.5 nm
Wavelength bunching	Programmable, 1 - 400 nm, in steps of 1 nm
Flow cells	• Max-Light Cartridge Cell (Standard) 10 mm, σ_v = 1.0 µL, 60 bar (870 psi) pressure maximum with RFID tags • Max-Light Cartridge Cell (High Sensitivity) 60 mm, σ_v = 4 µL, 60 bar (870 psi) pressure maximum with RFID tags
Spectral tools	Data analysis software for spectra evaluation, including spectral libraries and peak purity functions.
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.
GLP features	RFID for electronics records of flow cell and UV lamp conditions (path length, volume, product number, serial number, test passed, usage). 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 deuterium lines.
Safety and maintenance	Extensive diagnostics, error detection and display (through Instant Pilot and Agilent Lab Advisor), leak detection, safe leak handling, leak output signal for shutdown of pumping system. Low voltages in major maintenance areas.
Others	Electronic temperature control (ETC) for complete optical unit.

Specifications: Agilent 1260 Infinity Diode Array Detector VL (G1315D)	
Detector type	1024-element diode array
Light source	Deuterium and tungsten
Number of signals	8
Maximum sampling rate	20 Hz
Short-term noise	$< \pm 0.7 \times 10^{-5}$ AU at 254/4 nm and at 750 nm, TC 2 sec.
Drift	$< 0.9 \times 10^{-3}$ AU/hr at 254 nm
Linearity	> 2.0 AU (5 %) at 265 nm
Wavelength range	190-950 nm

Wavelength accuracy	± 1 nm, self-calibration with deuterium lines verification with holmium oxide filter.
Slit width	Programmable: 1, 2, 4, 8, 16 nm
Diode width	< 1nm
Wavelength bunching	Programmable, 1 - 400 nm, in steps of 1 nm
Flow cells	**Standard** 13-µL volume, 10 mm-cell path length, 120 bar (1740 psi) pressure maximum **Semi-micro** 5-µL volume, 6-mm cell path length, 120 bar (1740 psi) pressure maximum **Micro** 2-µL, volume, 3-mm cell path length, 120 bar (1740 psi) pressure maximum **Semi-nano** 500-nanoliter volume, 10-mm cell path length, 50 bar (725 psi) pressure maximum **Nano** 80-nanoliter volume, 6-mm cell path length, 50 bar (725 psi) pressure maximum **High Pressure (for SFC)** 1.7-µL volume, 6-mm cell path length, 400 bar (5802 psi) pressure maximum **Preparative 3 mm** 3-mm cell path length, 120 bar (1740 psi) pressure maximum **Preparative 3 mm** 0.3-mm cell path lenght, 20 bar (291 psi) pressure maximum, quartz **Preparative 0.06 mm** 0.06-mm cell path length, 20 bar (291 psi) pressure maximum, quartz
Time programmable	Wavelength, polarity, peak width, lamp bandwidth, autobalance, wavelength range, threshold, spectra storage mode.
Spectral tools	Data analysis software for spectra evaluation, including spectral libraries and peak purity functions.
Analog output	Recorder/integrator: 100 mV or 1 V, 2 outputs
Communications	LAN, Controller-area network (CAN), RS-232C, APG Remote: ready start, stop and shut-down signals,
GLP features	RFID for electronics records of flow cell and UV lamp conditions (path length, volume, product number, serial number, test passed, usage). 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.
Safety and maintenance	Extensive diagnostics, error detection and display through Agilent Instant Pilot and Agilent Lab Advisor software. Leak detection, safe leak handling, and leak output signal for shutdown of pumping system. Low voltages in major maintenance areas.
Others	Electronic temperature control (ETC) for the complete optical unit.

Specifications: Agilent 1260 Infinity Diode Array Detector VL Plus (G1315C)	
Detector type	1024-element diode array
Light source	Deuterium and tungsten
Number of signals	8
Maximum sampling rate	80 Hz
Short-term noise	< ± 0.7 x 10^{-5} AU at 254/4 nm and at 750 nm, TC 2 sec.
Drift	< 0.9 x 10^{-3} AU/hr at 254 nm
Linearity	> 2.0 AU (5 %) at 265 nm
Wavelength range	190-950 nm
Wavelength accuracy	± 1 nm, self-calibration with deuterium lines verification with holmium oxide filter.
Slit width	Programmable: 1, 2, 4, 8, 16 nm
Diode width	< 1 nm
Wavelength bunching	Programmable, a - 400 nm, in steps of 1 nm

Flow cells	**Standard** 13-µL volume, 10 mm-cell path length, 120 bar (1740 psi) pressure maximum **Semi-micro** 5-µL volume, 6-mm cell path length, 120 bar (1740 psi) pressure maximum **Micro** 2-µL, volume, 3-mm cell path length, 120 bar (1740 psi) pressure maximum **Semi-nano** 500-nanoliter volume, 10-mm cell path length, 50 bar (725 psi) pressure maximum **Nano** 80-nanoliter volume, 6-mm cell path length, 50 bar (725 psi) pressure maximum **High Pressure (for SFC)** 1.7-µL volume, 6-mm cell path length, 400 bar (5802 psi) pressure maximum **Preparative 3 mm** 3-mm cell path length, 120 bar (1740 psi) pressure maximum **Preparative 3 mm** 0.3-mm cell path lenght, 20 bar (291 psi) pressure maximum, quartz **Preparative 0.06 mm** 0.06-mm cell path length, 20 bar (291 psi) pressure maximum, quartz
Time programmable	Wavelength, polarity, peak width, lamp bandwidth, autobalance, wavelength range, threshold, spectra storage mode.
Spectral tools	Data analysis software for spectra evaluation, including spectral libraries and peak purity functions.
Analog output	Recorder/integrator: 100 mV or 1 V, 2 outputs
Communications	LAN, Controller-area network (CAN), RS-232C, APG Remote: ready start, stop and shut-down signals,
GLP features	Data recovery card to prevent data losses. RFID for electronics records of flow cell and UV lamp conditions (path length, volume, product number, serial number, test passed, usage). 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.
Safety and maintenance	Extensive diagnostics, error detection and display through Agilent Instant Pilot and Agilent Lab Advisor software. Leak detection, safe leak handling, and leak output signal for shutdown of pumping system. Low voltages in major maintenance areas.
Others	Electronic temperature control (ETC) for the complete optical unit.

Orderig Details – Agilent 1260 Infinity Diode Array Detector

Description	Product Number
1260 Infinity Diode Array Detector Includes Max-Light Standard Cartridge Cell with 10 mm path length .	G4212B
Change to Max-Light High Sensitivity Cartridge Cell with, 60 mm path length.	#030
Add G4212-60007 Max-Light High-Sensitivity flow cell with 60 mm path length.	#031
Add G4212-60011 Max-Light Cartridge Test cell	#040
Max-Light Standard Cartridge Cell 10 mm path length	G4212-60008
Max-Light High Sensitivity Cartridge Cell 60 mm path length	G4212-60007
Max-Light Cartridge Test Cell	G4212-60011

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