Agilent 5977B Series GC/MSD System

Data Sheet

The Agilent 5977B Series Gas Chromatograph/Mass Selective Detector (GC/MSD) builds on a tradition of leadership in GC and MS technology, with the world's best performance and productivity features including:

- Revolutionary High Efficiency Source (HES) offers the industry's lowest Instrument Detection Limit (IDL) and best S/N
- Up to 10x increase in MS signal brings the future into today's single quadrupole laboratory
- Leverage increased MS sensitivity to reduce sample size and lower operating costs for transportation, storage, preparation, and waste disposal
- Industry-leading robustness and reliability ensure years of successful lab productivity
- The power and flexibility of both MassHunter Quantitative and Qualitative Analysis and Classic MSD ChemStation
- Enhanced communication between the GC and MSD for more efficient and safer operation
- Eco-friendly features save time and money

Mass Selective Detector (MSD)	
EI source	Four supported sources: Stainless Steel, Inert, Extractor, or High-Efficiency Source (HES)
CI source	PCI, NCI, and EI acquisition
Ion source temperature	150–350 °C
Quadrupole temperature	106–200 °C
Mass filter	Heated monolithic hyperbolic quadrupole
Mass range	1.6–1,050 u
Scan speed	5977B Inert Plus (Extractor Source) and 5977B HES up to 20,000 5977B (SS Source) up to 12,500 u/sec
Mass accuracy	1-µL injection of a 100 pg/µL OFN[1] standard scanning from 50-300 u will give its monoisotope at m/z 271.987 ± 0.005[2]
Spectral accuracy	1-µL injection of a 100 pg/µL OFN standard scanning from 50–300 u will give 99.0% spectral accuracy[2]
Mass axis stability	Better than 0.10 u/48 hours
Detector	Triple-Axis Detector with high energy dynode and long life electron multiplier

[1] Octafluoronaphthalene (OFN)

[2] Only applicable with optional Accurate Mass software package. Scan mode only. Not verified during installation.

Instrument Detection Limit (IDL)

- The industry's most rigorous performance metric
- Based on eight replicate injections and their statistical analysis of precision (%RSD)
- Measured at an analytical amount near the detection limit
- Accurate assessment of the true detection limit and LLOQ
- IDL is tested and proved at installation

Installation checkout specifications		
Agilent instrument	Instrument detection limit*	Source
5977B HES MSD	1.5 fg	HES
5977B EI/CI MSD	10 fg (EI)	Extractor for EI, CI source for CI
5977B Inert Plus EI MSD	10 fg	Extractor
5977B EI MSD	24 fg	Stainless steel
5977B w/7820 GC	40 fg	Stainless steel

* IDL statistically derived at 99 % confidence level from the area precision of eight sequential splitless injections of OFN

- HES IDL measured using 10 fg injection, 1-µL injection
- Other IDLs measured using 100 fg, 1-µL injection
- 30 m column used for IDL checkout
- Helium carrier gas with Auto Liquid Sampler

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Installation checkout specifications

Agilent instrument configuration	Source	EI scan S/N[3]*	Sample concentration (1-µL injection)	PCI scan S/N[4]	NCI scan S/N[5]	High Vacuum System
5977B HES MSD	HES	**300:1**	**0.1 pg/µL OFN**			Turbo molecular pump
5977B EI/CI MSD	Extractor for EI, CI source for CI	1,500:1	1 pg/µL OFN	1,200:1	2,000:1	Turbo molecular pump
5977B Inert Plus EI MSD	Extractor	1,500:1	1 pg/µL OFN			Turbo molecular pump
5977B EI MSD	Stainless steel	550:1	1 pg/µL OFN			Turbo molecular pump or diffusion
5977B w/7820 GC	Stainless steel	250:1	1 pg/µL OFN			Turbo molecular pump or diffusion

* Helium carrier gas, manual injection, using 30 m × 0.25 mm ID, 0.25 µm film column

Gas chromatography

Gas chromatograph	Agilent 7890B, 7820
Sample introduction	Agilent 7693, 7650, CTC PAL3, 7697, thermal desorption, headspace, purge & trap, and other third party devices
Oven temperature	Ambient +5 – 450 °C
Retention-time locking	RTL-ready

Data system

Software	GC/MSD MassHunter Acquisition with both MassHunter and Classic ChemStation Data Analysis
Target deconvolution	Integrated Deconvolution and Spectral Matching for identification and quantitation of low level targets in complex matrix
Simultaneous signal acquisition	Simultaneous support of two MSDs and four GC detectors
SIM/Scan	Automated SIM setup and synchronous SIM/scan operation; CI optimization in both PCI & NCI modes for common reagent gases
Application autotunes	One-click autotune for BFB, DFTPP (Inert and SS source)

Optional libraries and software tools

Spectral libraries	NIST, Wiley/NIST, Maurer-Pfleger-Weber Drug
Retention time locked databases	Pesticides and endocrine disrupter databases, volatiles, PCBs, toxicology, hazardous chemicals, indoor air toxics, Japan Positive List, forensic toxicology, environment semivolatiles, and several user contributed libraries
Accurate mass	Cerno MassWorks, a post-acquisition software tool to achieve higher mass accuracy on an Agilent GC/MSD for greater confidence in empirical formula and unknown compound ID
Multivariate analysis	Mass Profiler Professional

Physical requirements with the Agilent 7890B GC

Dimensions (GC/MS)	88 cm (w), 56 cm (d), 50 cm (h) Additional space should be added for the auto injector, sample tray, data system, and printer.
Weight (GC/MS)	81 to 96 kg (depending on configuration)

[3] Standard scanning from 50 to 300 u at nominal 272.0 u ion.

[4] 1-µL injection of 100 pg/µL Benzophenone (BZP) standard, 80 to 230 u scan at nominal 183 u ion, using methane reagent gas.

[5] 2-µL injection of 100 fg/µL OFN standard scanning from 50 to 300 u at nominal 272 u ion, using methane reagent gas.

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