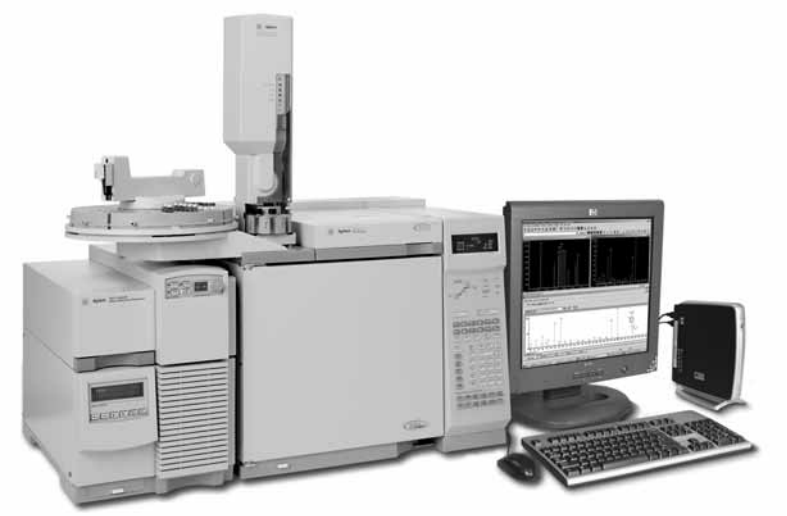
Agilent 5973 inert GC/MS System

Data Sheet



GC/MS

The Agilent 5973 inert Gas Chromatograph/Mass Spectrometer (GC/MS) is the latest in the 5973 series of mass selective detectors (MSDs). This model provides improved inertness for reactive compounds resulting in better peak shape. This improvement is due to a new material for the ion source. Since this is not a coating, the inertness does not change with cleaning. This source is available as an upgrade for older 5973 series instruments.

The 5973 inert system is retention time locking (RTL) ready. RTL is a unique Agilent feature that allows creation of permanent and universal methods. Using RTL methods, the retention times (RTs) do not change, even with column maintenance. The same RTs will be obtained on the GC/MS as they will on GCs with conventional detectors. It allows exact matching of peaks across multiple instruments, whether in the same lab or in another country.

RTL databases for specific compound classes allow for rapid screening of a large number of compounds without injecting hundreds of standards.

The 5973 series instruments are known for their reliability, ruggedness, and long-life. The 5973 inert system offers even greater value with a 10-year use guarantee, whether it is purchased in the first or last year of production. This guarantee provides greater assurance for low-cost of ownership.

The Agilent 5973 inert GC/MS features:

- Proven ruggedness and reliability
- Improved, more inert EI source for better performance on active compounds
- Higher sensitivity
- Higher maximum source temperature
- Greater mass stability - better than 0.10 amu over 48 hours
- Performance electronics for 10,000 amu/s scan speed (8,000 amu/s write-to-disk)
- Enhanced software
- RTL-ready
- Compatible with microfluidics flow controller
- Compatible with flip-top inlet sealing system
- Short GC interface (<20 cm)
- Independently heated zones: transfer line, source, quad
- Proprietary hyperbolic gold-coated quadrupole
- Heatable quadrupole to 200 °C
- Easy access to full ion optics
- High energy dynode and electron multiplier (EM) detector
- Two MS control per PC
- Four simultaneous signal acquisitions (up to 2 MS)
- Intelligent sequencing for samples
- Upgrade source for 5973 series GC/MSDs
- Compatibility with many third-party sampling devices
- Optional 21CFR11 compliance software
- Ten-year use guarantee

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Mass Spectrometer

Mode (standard)	EI
Modes (optional)	PCI, NCI, EI with CI source
Ion source type	Noncoated inert EI source
Ionization energy	5–241.5 eV
Ionization current	0–315 µA
Transfer line temperature	100 °C–350 °C
Ion source temperature	150 °C–300 °C
Quadupole temperature	150 °C–200 °C
Mass filter	Monolithic hyperbolic quadrupole
Mass filter protection	Entrance lens
Mass range	1.6–800 amu
Mass resolution	Unit mass adjustable by tune
Mass axis stability	Better than 0.10 amu/48 h
Detector	EM with replaceable horn
Dynamic range (electronic)	10e6
Scan rate (electronic)	10,000 amu/s
Write-to-disk	8,000 amu/s
SIM	30 ions × 50 groups
Pumping system	Turbomolecular pump
Total flow	2 mL/min (standard turbo) 4 mL/min (performance turbo)
Instrument control	Data system and local user interface
Maintenance access	Source, filaments, lenses, mass filter, and detector on removable plate
Maintenance scheduling	Early maintenance feedback

Gas Chromatograph

Automatic injector (optional)	Automatic alignment, fast injection
Liner replacement	Compatible with optional flip-top inlet sealing system
Injector	Split-splitless (standard), others available
Oven temperature	Ambient +4 °C– 450 °C
Oven ramps/plateaus	6/7
Carrier gases	Helium, hydrogen, nitrogen, argon
Electronic pneumatic control	Auto pressure regulation for split/splitless, septum purge
Carrier gas control modes	Constant pressure and flow modes; pressure and flow programmable
Pressure range	0–100 psi (standard), 0–150 psi (optional) with 0.01 psi resolution, pressure and temperature corrected
Retention-time locking	RTL ready
Flow control	Compatible with optional microfluidics controller

Data system

Simultaneous MS and GC	Four signals (up to 2 MS) detector data acquisitions
Ionization mode autotunes	EI, PCI, NCI
Application autotunes	BFB, DFTPP
Quantitation setup	Automated
Application reports	Environmental, drugs of abuse, aromatics in gasoline
File import/export	Sequence file/quant and custom report
Customization	Macro language, report writer
Security	Password and audit trail
Spectral libraries (optional)	NIST, Wiley, Pfleger-Mauer Drug, Stan pesticide
Spectral and RTL databases (optional)	Pesticides and endocrine disrupters, volatiles, PCBs, toxicology, FAMEs, flavors, organotin compounds
21CFR11 Compliance	Optional software available
Other capabilities (optional)	Deconvolution linked with RTL database
Support life	Ten-year use guarantee

Physical (EI system with standard turbo)

Dimensions	88 cm (w) × 56 cm (d) × 50 cm (h)
Weight	88 kg

Installation Checkout Specifications

All tests performed using an autosampler, split-splitless injector, and a 30 m × 0.25 mm × 0.25 µm HP-5MS column. All scan determinations use continuous linear scanning across the entire mass range. Noise selection, peak integration, and RMS s/n calculation performed by automated macro. Specifications are not comparable to those using different conditions. The system will exceed the following specifications at installation:

EI scan sensitivity	60:1 s/n for 1-pg OFN scanning from 50–300 amu at nominal *m/z* 272 ion
PCI scan sensitivity	75:1 s/n for 100-pg BZP scanning from 80–230 amu at nominal *m/z* 183 ion
NCI scan sensitivity	500:1 s/n for 1-pg OFN scanning from 50–300 amu at nominal *m/z* 272 ion

Other Sensitivity Specifications

EI SIM sensitivity	10:1 s/n for 20-fg OFN at nominal *m/z* 272 ion
PCI SIM sensitivity	10:1 s/n for 1-pg BZP at nominal *m/z* 183 ion
NCI SIM sensitivity	10:1 s/n for 1-fg OFN at nominal *m/z* 272 ion

Trace Repeatability

Results are for three replicate splitless injections of 1-pg OFN using MS detection and automated integration and processing. Specifications using a different compound, concentration, detectors, or conditions, are not comparable.

Trace RT repeatability	<0.0012 min
Trace area repeatability	<2.0% RSD

Safety, Regulatory Compliance and Operational Conditions

The instrument is designed and manufactured under a quality system registered to ISO 9001. The instrument complies with international regulatory, safety, and electromagnetic compatibility requirements. The specifications are more conservative than actual test conditions. In addition, further testing was done under Agilent standards to assure operation after delivery and long-term usage.

See http://www.chem.agilent.com/cag/aboutapg/aboutQuality.html for further information and typical product testing videos.

Safety	Canadian Standards Association (CSA): C22.2 No. 1010.1
	CSA/Nationally Recognized Test Laboratory (NRTL): UL 61010A-1
	International Electrotechnical Commission (IEC): 61010-1
	EuroNorm (EN): 61010-1
Electromagnetic compatibility	CISPR11/EN: Group 1, Class A IEC/EN 61326 Australian/NZ 'C-tick' Canadian ICES-001
Sound emission	EN 27779:1991 - sound pressure Lp <70 db
Power	120VAC +5%/–10%, 50/60 Hz ±5%
	200–240VAC +5%/–10%, 50/60 Hz ±5%
Operating environment	15–35 °C, 40%–80% relative humidity - noncondensing (operational)
	-20–70 °C, 0%–95% relative humidity - noncondensing (storage)

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