

# Varian 320-MS GC/MS

The Varian 320-MS GC/MS is a sensitive and flexible quadrupole GC/MS or GC/MS/MS system. The 320-MS provides a small, powerful, flexible system that is fully upgradeable to an LC/MS system, making it the best choice for any application involving demanding matrices and sensitive quantitation.

## Analyzer

### MS Specifications

- Scan modes: Q1MS, Q3MS, Precursor (Parent), Product (Daughter), Neutral Loss, Selected Ion Monitoring (SIM), Selected Reaction Monitoring (SRM), Full Scan
- Ionization modes: Electron Ionization (EI) or positive/negative Chemical Ionization (CI)
- Source: EI/CI source with vacuum interlock for quick change of ion volumes; entrance hexapole isolates source contaminants from mass filter
- Source temperature: independent control, 20 °C to 325 °C
- Filament: single, 50 to 500  $\mu$ A
- Electron energy: 20 eV, 70 eV or 150 eV
- Mass filters: quadrupole with pre- and post-filters; lensless design maximizes transmission efficiency
- Collision cell: 180° curved path with pre- and post-filter region; long path ensures high dissociation efficiency
- Mass range: Up to 2000 Da
- Scan rate: Up to 6000 Da/sec
- Resolution: 0.7 Da at 1250 Da/sec or 0.6 Da at 500 Da/sec
- EI dynamic range:  $>10^5$  (compound dependent)
- Mass axis stability:  $\pm 0.1$  Da over 24 hours
- Transfer line temperature: independent control; 50 °C to 325 °C
- Manifold temperature: independent control; 30 °C to 50 °C
- Ion detector: positive or negative ions, constant 5 kV post acceleration voltage
- Carrier gas flow: up to 8 mL
- Turbomolecular pump: dual stage, 300/380 L/sec, air cooled

- Power requirements: 100–240 Vac, 50/60 Hz  $\pm 3$  Hz, 1200 VA
- Humidity: 20% to 80% relative humidity (without condensation)
- Temperature: 15 °C to 30 °C
- High efficiency electron multiplier: 240 ms Positive to Negative switching time
- Adjustable dwell times: 2–14,000 ms software defined per transition

### Optional MS Features

- Spectral databases: NIST, Wiley, and Pflieger/Maurer/Weber (PMW) libraries
- MS/MS: upgrade single quadrupole systems to triple quadrupole at any time
- LC interface: field upgradeable at any time
- Direct Sampling Probes (DIP and DEP): introduce solids or liquids without chromatographic separation.

### 450-GC Specifications

#### Column Oven

- Dimensions: 28 cm (w) x 28 cm (h) x 19 cm (d) / 11 in. x 11 in. x 7.5 in.
- Temperature range: ambient +4 °C to 450 °C; -99 °C to 450 °C with LN<sub>2</sub>; -65 °C to 450 °C with LCO<sub>2</sub>
- Temperature-programmed ramps: 25 temperature ramps per method
- Maximum temperature ramp rate: 120 °C/min for all voltages
- Rapid column oven cool-down rate: 400 °C to 50 °C in 4.5 min
- Time-programmable detectors with metering, on/off gas controls; up to 3 data channels.

#### GC Power Requirements

- 120 Vac  $\pm 10\%$ , 60 Hz  $\pm 2\%$ , 20 A, 2.4 kW
- 230 Vac  $\pm 10\%$ , 50 Hz  $\pm 2\%$ , 20 A, 2.3 kW
- 101 Vac  $\pm 10\%$ , 50 or 60 Hz  $\pm 2\%$ , 25 A, 2.5 kW



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# Varian 320-MS GC/MS

## Environmental Requirements

- Humidity: 20% to 80% relative humidity (without condensation)
- Temperature: 16 °C to 30 °C operating

## Injectors

### CP-1177 Split/Splitless Injector

- Temperature range: 50 °C to 450 °C isothermal

### 1079 PTV Injector

- Temperature range: -99 °C to 450 °C with LN<sub>2</sub>; -65 °C to 450 °C with LCO<sub>2</sub>
- Maximum temperature ramp rate: 200 °C min
- Temperature ramps: 4

## Injector EFC

- Pressure range: 0 to 100 psi
- Total flow: 500 mL/min at 10 psi

## Optional GC Features

- Injectors: up to three (one required); CP-1177 Split/Splitless or 1079 PTV (Programmable Temperature Vaporizing)
- Detectors: up to three; full range of Varian detectors including the FID, ECD, PFPD, TSD, and TCD; maximum of two PFPDs
- QuickSwitch Valve: instantly switch between injector/columns, and detectors
- ChromatoProbe™: probe device for solids, large volumes of liquids, or slurries; requires 1079 PTV injector
- Valves: custom valves for wide range of applications

## Foreline Pump

- Varian DS-42 Dual stage, rotary vane
- Voltage: 101, 120, 230 V depending on GC

## 320-MS GC/MS Dimensions

- 50 cm (w) x 38 cm (h) x 71 cm (d) / 19.5 in. x 15 in. x 28 in.; 108 kg/237 lb

## Performance Specifications\*

Mode	Amount	Test Standard	S/N <sup>†</sup>
EI Full Scan	1 pg	Octafluoronaphthalene	≥20:1
EI SIM	50 fg	Octafluoronaphthalene	≥10:1
EI MS/MS	100 fg	Octafluoronaphthalene	≥10:1
NCI SIM	5 fg	Octafluoronaphthalene	≥10:1
PCI Full Scan <sup>‡</sup>	20 pg	Benzophenone	≥10:1
PCI MS/MS <sup>‡</sup>	100 fg	Benzophenone	≥10:1

\*With the CP-1177 Injector or the 1079 PTV injector in hot splitless mode.

<sup>†</sup>Based on RMS noise.

<sup>‡</sup>PCI is with methane reagent gas.

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