Varian 310-MS LC/MS

The Varian 310-MS LC/MS provides maximum performance for pharmaceutical, toxicological, environmental, and other applications requiring quantitation in a heavy matrix. The API inlet is sensitive and robust and the unique MS analyzer consistently delivers superior signal-to-noise.

The 310-MS is flexible, affordable, and easy to use making it an ideal system for LC/MS.

Specifications

- Analyzer mass range: 10 to 2000 Da
- Scan rates: 500 to 6000 Da/sec
- Resolution: unit mass over the entire range
- Linear dynamic range: up to 10^5, compound-dependent based upon analytical methods
- Mass axis stability: ±0.1 Da over 24 hours
- Manifold temperature: independent control; 30 °C to 50 °C
- Ion detector: positive or negative ions, constant 5 kV post acceleration voltage
- Triple quadrupole modes: Q1MS and/or Q3MS for Selected Ion Monitoring (SIM) or Full Scan, Precursor Scan, Product Scan, Neutral Loss Scan, Selected Reaction Monitoring (SRM)
- Turbomolecular pump: dual stage, 310/400 L/sec, air cooled
- High efficiency electron multiplier: 240 ms positive to negative switching time
- Adjustable dwell times: <5 ms

Atmosphere Pressure Ionization (API) Interface

- SelecTemp™ allows temperature programming of the drying gas throughout the analysis
- SelecFlow™ allows electronic flow control of the drying gas throughout the analysis
- Drying gas temperature: 400 °C maximum at 8 L/min
- Drying gas flow rate: up to 10 L/min
- Spray chamber temperature: up to 60 °C
- Spray needle: off-axis from the capillary axis
- Quadrupole ion guide: 6° off-axis for the capillary axis
- Capillary voltage: up to 300 V

Electrospray Interface (ESI)

- LC flow range: 1 to 1000 µL/min
- Needle voltage: up to 6 kV
- Nebulizing gas flow: up to 2 L/min
- Spray plate voltage: up to 800 V
- Spray needle: wide range of adjustments for x-y positioning; independent adjustment of the inner liquid capillary needle to the outlet of the nebulizing gas

Mass filters (Q1 and Q3)

- Quadrupole with pre- and post-filters (guides)
- Lensless design between the quadrupoles

Collision cell (Q2)

- 180° curved cell with pre- and post-filter region:
  - In single and triple quadrupole modes, the curvature of Q2 minimizes noise by positioning the multiplier off-axis from the source.
  - In MS/MS modes, the long, 185 mm path ensures high dissociation efficiency.

Vacuum System

- Foreline pump: one Varian HS 652 universal voltage pump
- Pump includes:
  - oil mist eliminator
  - oil return kit

Utilities and Environment

- Power requirements for the MS: 100-240 Vac, 50/60 Hz ±3 Hz, 1.0 kW
- Power requirements for the foreline pump: 100-240 Vac, 50/60 Hz, 2.8 kW
- Venting for the API spray chamber: up to 12 L/min
- Venting for the foreline pumps: up to 2 L/min
- Nitrogen (+ESI) nebulizing and drying gas: up to 12 L/min, regulated at 80 psi
- Air (-ESI) nebulizing gas: up to 2 L/min, regulated at 80 psi
- Humidity: 20% to 80% relative humidity (without condensation)
- Temperature: 16 °C to 30 °C

User Upgradeable Options

The APCI option is a separate needle/chamber that uses the same hinge/clip mounting system as the ESI chamber. Changing from ESI to APCI takes only a few minutes to disconnect and connect the appropriate electrical, gas and LC lines and does not require venting the instrument.

APCI Specifications

- LC flow range: 100 to 2000 µL/min
- Corona current: -50 to +20 µA
- Nebulizing gas flow: up to 2 L/min
- Auxiliary gas flow: 4 L/min typical
- Auxiliary gas temperature: 550 °C maximum; optimum is compound, mobile phase and flow dependant
- Spray plate voltage: up to 800 V
- Capillary voltage: up to 300 V
- Drying gas temperature: 400 °C maximum at 8 L/min
- Drying gas flow rate: up to 10 L/min
- Spray chamber temperature: up to 60 °C
- Spray needle: off-axis from the capillary axis
- Quadrupole ion guide: 6° off-axis for the capillary axis

Chromatography Options

The MS workstation fully controls a wide range of chromatography products including:

- AutoSamplers: ProStar™ 400, 410, 420, 430, and HTS PAL
- Solvent Delivery Modules: 212-LC; ProStar 210, 220, 230, and 240; PrepStar™ 218, SD-1, and SD-2
- Column Valve Module: ProStar 500
- Detectors: ProStar 325, 340 UV-Visible Absorbance, 335 Photodiode Array, 363 Fluorescence and PL-ELS 2100 ELSD
- Fraction Collectors: ProStar 701 and 704

310-MS LC/MS Dimensions

- 50 cm (w) x 38 cm (h) x 71 cm (d) / 9.5 in. x 15 in. x 28 in., 108 kg/237 lb

Performance Specifications

Mode	Test Standard	S/N*
+ESI SIM	5 pg Reserpine	≥10:1
+ESI MS/MS	5 pg Reserpine	≥20:1

*Based on RMS noise, 0.7 PWHM resolution

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