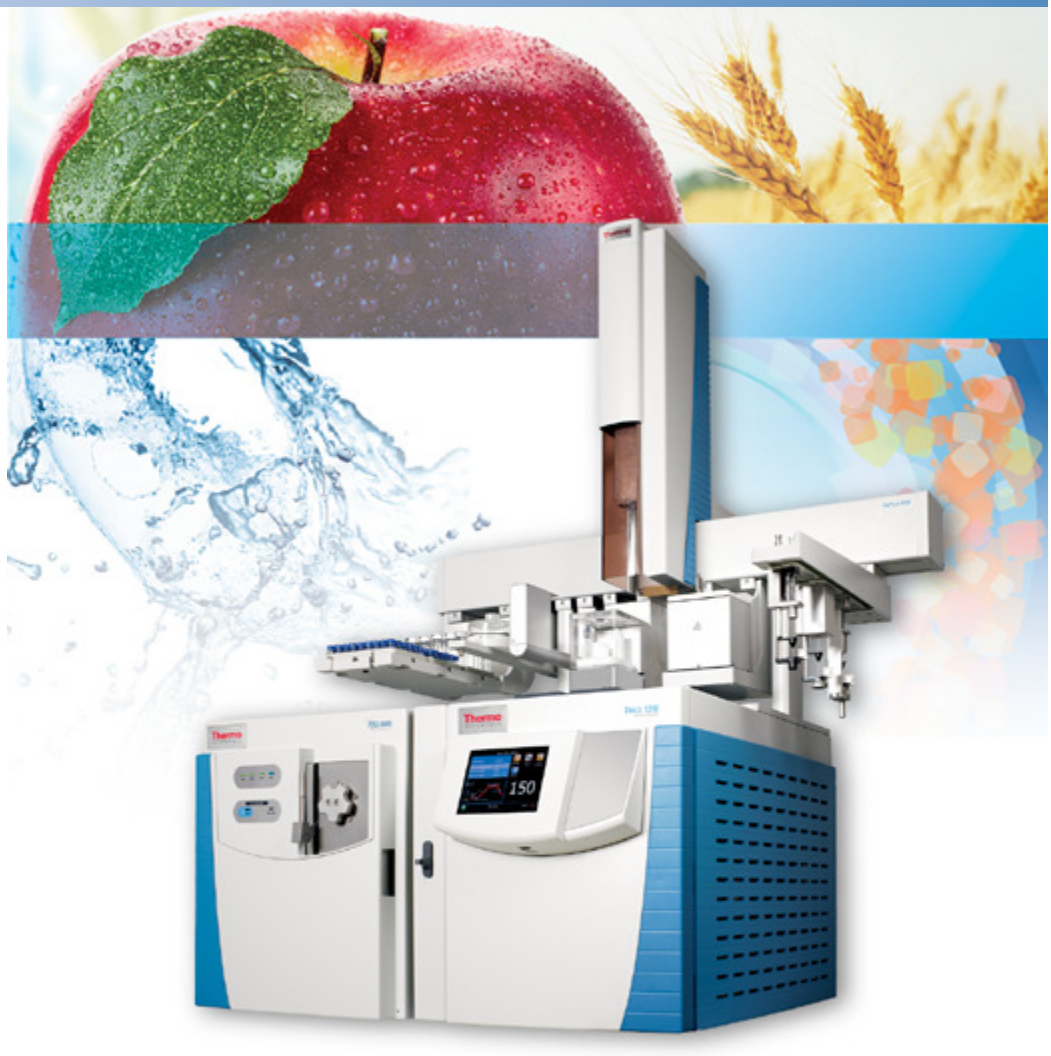
Thermo Scientific TSQ 8000 Evo Triple Quadrupole GC-MS/MS

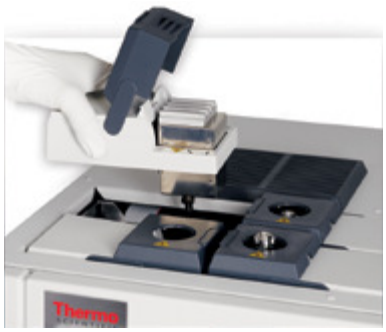
Easy operation, brilliant results

The Thermo Scientific™ TSQ™ 8000 Evo Triple Quadrupole GC-MS/MS is ideal for labs looking for the next step up in triple quadrupole GC-MS/MS productivity. It is the latest evolution of the highly successful TSQ 8000 GC-MS/MS system and the evolution of unstoppable productivity, MS/MS simplicity, and ultimate performance SRM.

The TSQ 8000 Evo triple quadrupole GC-MS/MS has been designed with the needs of high throughput analytical laboratories in mind. It is a unique system that offers a harmonious combination of hardware and software features that help laboratories adapt to their changing environment and deliver quality results on time, every time.

The mass spectrometer comes paired with the Thermo Scientific™ TRACE™ 1300 GC or TRACE 1310 GC, which offer the unique flexibility of instant connect injector and detector modularity. Add a Thermo Scientific™ AI/AS 1310 autosampler for automated liquid injection or the Thermo Scientific™ TriPlus™ RSH autosampler for additional automated sample handling capabilities to obtain the ultimate in analytical productivity.





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TSQ 8000 Evo Triple Quadrupole Mass Spectrometer

Mode (MS)
- Electron Impact Ionization (EI), with full scan (FS), SIM, and FS/SIM simultaneous within sample injection, timed acquisition (t-SIM), and FS/t-SIM

Modes (MS/MS)
- Multiple/Selected Reaction Monitoring (MRM/SRM), timed acquisition (t-SRM), combined SRM/FS, combined t-SRM/FS, product ion scan, precursor ion scan, neutral loss scan
- Ability to convert timed acquisition method (t-SIM/t-SRM) into general mode (segmented) method

Ion Source Type
- Thermo Scientific™ ExtractaBrite™ Electron Impact Ionization (EI) source (standard)
- Chemical Ionization (CI) with Positive Ion Chemical Ionization (PCI) and Negative Ion Chemical Ionization (NCI) source (optional)
- Combination EI/PCI/NCI source used without interchange (optional)
- Ion source includes ion volume, repeller, source lenses, RF lens and dual filaments in all ionization modes, programmable from 50 °C to 350 °C

Source Access
- Remove entire ion source or change to CI source in under 2 minutes without venting

Software Features
- Automated SRM Development (AutoSRM)
- SIM Bridge – a tool to import SIM and SRM acquisition tables in comma-separated-values (CSV) formats into AutoSRM and instrument method
- Automated acquisition window adjustment based on retention time
- Compound based acquisition method setup
- Customizable automated tuning

Mass Analyzer
- Heated, off-axis ion guide for noise reduction and solid, homogeneous, non-coated, maintenance-free quadrupole rods
- Fast quadrupole scanning, up to 20,000 u/s

Mass Resolution
- Automatic tuning down to 0.4 u and lower
- Selectable SRM resolution settings in method at autotune value, 1.5 u and 2.5 u

Detector
- Thermo Scientific™ DynaMax™ XR detection system, with off-axis 10 kV dynode, discrete dynode electron multiplier and electrometer, linear range of $>10^7$ (0–68 µA)

Collision Energy Range
- 0–60 eV

Mass Range
- 1.2–1100 u

Scanning Capabilities
- Up to 20,000 u/s
- Ability to acquire more than 97 scans/s in FS when scanning over a range of 125 u
- 0.5 ms minimum SRM dwell times
- Up to 800 SRM transitions/s

Pumping Systems
- High-capacity (>300 L/s), dual-stage turbomolecular pump
- Mechanical rotary vane 3.3 m^3/h oil pump
- Foreline convectron gauge
- Optional oil-free scroll pump
- Ion gauge (optional)

Electron Energy
- Adjustable from 0 eV to 150 eV

Emission Current
- Up to 350 µA

Transfer Line Temperature
- Up to 400 °C

Gas Chromatograph (TRACE 1300 GC or TRACE 1310 GC)

Please refer to GC and autosampler specification sheets for additional details

- TRACE 1300 GC: Intuitive, single-button start/stop for ease of use with minimal local instrument interaction
- TRACE 1310 GC: Complete icon-driven touch screen user interface for direct local instrument control

Autosamplers
- AI/AS 1310, TriPlus RSH, TriPlus 100 LS, TriPlus 300 HS, and more

Instant Connect Modules
- User-installable injector or detector assembly can be installed in less than 2 minutes
- 0.001–1000 kPa digitally controlled carrier gas with gas saver and septum purge
- Split/Splitless (S/SL) injector with optional large volume kit for injections up to 30 µL
- Multi-mode Programmed Temperature Vaporization (PTV) injector including on-column capabilities and large volume injection up to 250 µL
- Integrated backflush optional for both S/SL and PTV
- 1000 kPa digitally controlled carrier gas with gas saver and septum purge
- Detector Fast Data Acquisition Rate: up to 300 Hz

Oven Temperature
- Operating temperature Range: Ambient 3 °C to 450 °C
- Operating temperature range with LN_2 Cryo: -100 °C to 450 °C
- Operating temperature range with CO_2 Cryo: -50 °C to 450 °C

Oven Performance
- Operating range: Ambient +3 °C to 450 °C
- Number of ramps/plateaus: 32/33
- Cryogenic Option Minimum Temperature: -100 °C with LN_2; -50 °C with liquid CO_2
- Maximum heating rate: 125 °C/min
- Oven cool-down (22 °C ambient): 450 °C to 50 °C in <4 min

GC Analytical Performance
- Retention Time Repeatability: <0.0008 min
- Peak Area Repeatability: <0.5 % RSD
- Pressure Set Points Minimum Increments: 0.01 kPa-0.001 psi in all ranges

Hydrogen Kit Option
- Optional Hydrogen Kit (includes hydrogen sensor and ion volume) required for use with hydrogen carrier gas on the TRACE 1300/1310 GC with the TSQ 8000 Evo MS

Instant Connect Helium Saver Module
- Compatible when connected to a TRACE 1300 Series GC
- Save helium during the analytical run, and when instrument is idle
- Analytical conditions remain the same; methods remain intact
- Realize significant savings in helium supply throughout the lifetime of your GC or GC-MS instrument

Microfluidics Options for TRACE 1300/1310 GC
- NoVent for easier column replacement without venting the system
- Dual Detector kit for splitting column effluent to two detectors (including MS)
- Consists of low-volume, highly inert SilFlow™ technology with finger-tight connectors

Direct Sample Probe System Option
- Switch to probe in <3 min with GC undisturbed
- Available in two styles: rapid heating filament Direct-Exposure Probe (DEP, capable of flash vaporization or pyrolysis at up to 1600 °C) or slower volatilization Direct-Insertion Probe (DIP, capable of accommodating powders and solid samples in a quartz or aluminum crucible) up to 450 °C

Data System Software and Options

- Thermo Scientific™ TraceFinder™ Software, a common platform for routine GC, GC-MS, LC, and LC-MS quantification
- TraceFinder Software for Environmental and Food Safety, with Compound Data Base of over 1300 pesticide SRM transitions
- TraceFinder Software for Clinical Research
- TraceFinder Software for Forensic Toxicology
- Commercial mass spectral library options, including NIST and Wiley libraries; Mass Spectral and GC Data of Drugs, Poisons, Pesticides, Pollutants and their Metabolites (Maurer-Pfleger-Weber library)

Performance Specifications

GC triple stage mass spectrometers are most frequently applied to trace quantitative analysis in complex matrix. This means that the ability of the system to select against matrix (reduce chemical noise) is a critical performance factor to be taken into consideration. This can be demonstrated with a signal-to-noise ratio (S/N). In addition, a S/N ratio also provides a guarantee against instrument contamination on installation. Finally, low level precision and instrument detection limits (IDL) provide the complete picture.

Standard Installation Specifications*

(Helium as carrier gas)

Electron Ionization SRM

- 1 µL of 100 fg/µL octafluoronaphthalene (OFN) will produce the following minimum signal-to-noise for the transition from *m/z* 272 to *m/z* 222: 12,000:1

Positive Ion Chemical Ionization SRM

- 1 µL of 5 pg/µL benzophenone (BZP) will produce the following minimum signal-to-noise for the transition from *m/z* 183 to *m/z* 105: 2500:1

Reference Specifications†

Electron Ionization Full Scan

- 1 µL of 1 pg/µL OFN will produce the following minimum signal-to-noise for *m/z* 272 when scanning from 50–300 u: 1,500:1

Positive Ion Chemical Ionization SRM

- 1 µL of 100 fg/µL BZP-D10 will produce the following minimum signal-to-noise for the transition from m/z 193 to m/z 110: 200:1

Negative Ion Chemical Ionization Full Scan

- 1 µL of 1 pg/µL OFN will produce the following minimum signal-to-noise for *m/z* 272: 10,000:1

Negative Ion Chemical Ionization SIM

- 1 µL of 100 fg/µL OFN will produce the following minimum signal-to-noise for *m/z* 272: 4,000:1

System Dimensions/Weights

Total width of the connected GC-MS system is 80 cm (31 in). System can be operated with back of MS pushed directly against wall or other object. Additional space should be allotted for data system and printer.

	System Dimensions *(height × width × depth)*	Weight
Mass Spectrometer	44 × 40 × 89 cm (17.5 × 16 × 35 in)	61 kg (135 lbs)
TRACE 1300 GC	45 × 44 × 60 cm (18 × 17 × 24 in)	35 kg (77 lbs)
TRACE 1310 GC	45 × 44 × 67 cm (18 × 17 × 26 in)	35 kg (77 lbs)

* Helium standard specifications are performed using a 15 m × 0.25 mm i.d. × 0.25 µm System Qualification Column (SQC).

† Reference specifications are typical performance specifications and not confirmed at install.

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