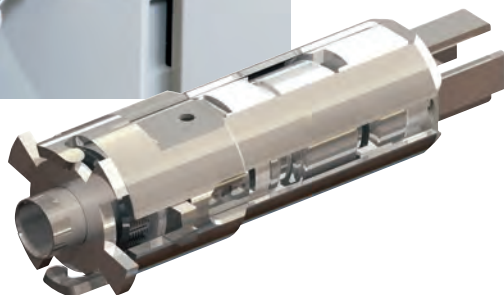


Thermo Scientific TSQ 8000 Triple Quadrupole GC-MS/MS

Easy operation, brilliant results

The Thermo Scientific TSQ 8000 Gas Chromatograph/Triple Quadrupole Mass Spectrometer offers the easiest way to achieve the lower detection limits and reduced sample prep allowed by selected reaction monitoring (SRM). The TSQ™ 8000 is the first triple quadrupole GC-MS/MS system to offer an extractable ion source under vacuum and software that fully automates SRM development. 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 Triple Quadrupole Mass Spectrometer

Mode (MS)

- Full scan, SIM, timed-SIM, combined full scan/SIM, combined full scan/timed-SIM

Modes (MS/MS)

- MRM, timed-MRM, combined MRM/full scan, combined timed MRM/full scan, product ion scan, precursor ion scan, neutral loss scan

Ion Source Type

- Thermo Scientific ExtractaBrite Electron Ionization (EI) source standard, and optional Positive Ion Chemical Ionization (PCI) and Negative Ion Chemical Ionization (NCI)
- 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 two minutes without venting

Software Features

- Automated SRM Development (AutoSRM)
- Automated acquisition window adjustment based on retention time
- Compound based acquisition method setup
- Customizable automated tuning

Quadrupole Assembly

- Heated, off-axis ion guide for noise reduction and solid, homogeneous non-coated quadrupole rods

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 dynode, discrete dynode electron multiplier and electrometer, linear range of $>10^7$ (0–68 μ A)

Collision Energy Range

- 0–60 eV

Mass Range

- 1.2–1100 u

Scanning Capabilities

- Up to 11,111 u/sec
- Ability to acquire more than 65 scans/sec in full scan when scanning over a range of 125 u
- 1 ms minimum SRM dwell times
- $>11,000$ SRM transitions possible in one run

Pumping Systems

- High capacity (>300 L/s He) turbomolecular pump with 3.9 m³/h (60 Hz) mechanical pump
- Optional oil-free alternative to mechanical pump
- Foreline convectron gauge standard, optional manifold ion gauge

Electron Energy

- Adjustable from 0 eV to 150 eV

Emission Current

- From 0 μ A to 350 μ A, with improved regulation at low current

Transfer Line Temperature

- Up to 400 °C

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

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

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Gas Chromatograph

(TRACE™ 1300 GC or TRACE 1310 GC)

Please refer to GC and autosampler specification sheets for additional details

Instant Connect (IC) Injector Modules

- Ability to swap or replace entire injector assembly in less than 2 minutes
- Split/Splitless injector with optional large volume kit for injections up to 30 μ L
- Multi mode Programmed Temperature Vaporization injector including on-column capabilities and large volume injection up to 250 μ L
- Integrated backflush optional for both S/SL and PTV
- 1000 kPa digitally controlled carrier gas with gas saver and septum purge

Autosampler

- AI/AS 1310, TriPlus™ RSH, and more

Oven Temperature

- Operating temperature Range: Ambient 3 °C to 450 °C
- Operating temperature range with LN₂ Cryo: -100 °C to 450 °C
- Operating temperature range with CO₂ Cryo: -50 °C to 450 °C

Oven Ramps/Plateaus Cool down

- Number of ramps/plateaus: 32/33
- Maximum heating rate: 125 °C/min
- Oven Cool-Down (22 °C ambient): 450 °C to 50 °C in <4 minutes

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 Sensor Option

- Optional hydrogen sensor suggested for use with hydrogen carrier gas on both TRACE 1300 and TRACE 1310 GC with the TSQ 8000 MS (p/n: 27605006)

Instant Connect Detector Modules

- Detectors Available: Flame Ionization Detector, Thermal Conductivity Detector, Electron Capture Detector, Nitrogen Phosphorus Detector
- Ability to add, swap or replace entire detector assembly in less than 2 minutes
- Fast Data Acquisition Rate: up to 300 Hz for FID, TCD, ECD, and NPD

Data System Software and Options

- Thermo Scientific Xcalibur Data system, common platform for all Thermo Scientific MS systems
- 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 the following: NIST libraries; Wiley libraries; Mass Spectral and GC Data of Drugs, Poisons, Pesticides, Pollutants and their Metabolites (Maurer-Pfleger-Weber library)

Direct Sample Probe System Option

- Switch to probe in under three minutes with GC interface undisturbed
- Available in two styles: rapid heating filament Direct-Exposure Probe (DEP, capable of flash vaporization or pyrolysis at up to 1000 °C) or slower volatilization Direct-Insertion Probe (DIP, capable of accommodating powders and solid samples in a quartz crucible)

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*

Electron Ionization SRM

- 1 μ L of 100 fg/ μ L octafluoronaphthalene (OFN) will produce the following minimum signal to noise for the transition from m/z 272 to m/z 222: **5000:1** using helium as carrier gas

Positive Ion Chemical Ionization SRM

- 1 μ L of 5 pg/ μ L benzophenone (BZP) will produce the following minimum signal to noise for the transition from m/z 183 to m/z 105: **2500:1** using helium as carrier gas

Reference Specifications†

Electron Ionization Full Scan

- 1 μ L of 1 pg/ μ L OFN will produce the following minimum signal to noise for m/z 272 when scanning from 50–300 u: **1000:1** using helium as carrier gas

Positive Ion Chemical Ionization SRM

- 1 μ L of 100 fg/ μ L BZP-D10 will produce the following minimum signal to noise for the transition from m/z 193 to m/z 110: **200:1** using helium as carrier gas

Negative Ion Chemical Ionization Full Scan

- 1 μ L of 1 pg/ μ L OFN will produce the following minimum signal to noise for m/z 272: **10000:1** using helium as carrier gas

Negative Ion Chemical Ionization SIM

- 1 μ L of 10 fg/ μ L OFN will produce the following minimum signal to noise for m/z 272: **300:1** using helium as carrier gas

Instrument Detection Limit

- 6 fg or less OFN derived at the 99% confidence level from area precision of eight sequential injections of 1 μ L, 10 fg/ μ L OFN, acquired in EI SRM

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



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