

Thermo Scientific ISQ Series Single Quadrupole GC-MS Systems

Advanced GC-MS systems designed for continuous high-throughput operation

With 50 years of GC-MS innovation, the Thermo Scientific™ ISQ™ Series GC-MS systems continue to deliver quality design and leading technology in single quadrupole mass spectrometry. The series consists of the ISQ QD GC-MS and ISQ LT GC-MS models.

For budget-minded lab owners seeking a reliable replacement for stand-alone GC systems, the ISQ QD GC-MS models represent robust solutions with quality design, MS operational simplicity, and proven dependability.

For high-throughput, analytically demanding laboratories, requiring the utmost sensitivity and unstoppable productivity, the ISQ LT GC-MS offers future-proof investment into the leading technology, simply intelligent GC-MS platform. Unlike other systems, the ISQ LT GC-MS does not need to be vented to exchange the ion source and provides utmost sensitivity, low detection limits and unparalleled flexibility.



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ISQ Series GC-MS System Specifications

Mode (Standard)

- Electron Impact Ionization (EI), with full scan (FS), SIM, and FS/SIM simultaneous within sample injection

Modes (Optional)

- AutoSIM and timed acquisition (t-SIM) mode (standard on ISQ LT and ISQ QD 300 systems, optional on ISQ QD system)
- Chemical ionization, including PCI, NCI, Thermo Scientific PPINICI and EI/PCI/NCI combination (ISQ LT system only)

Ion Source Type

- Thermo Scientific™ ExtractaBrite™ off-axis ion source, with repeller, source lenses, RF lens and dual filaments in all ionization modes
- Programmable to 350 °C

Source Access

- Vacuum probe interlock to remove entire source or change ionization modes without venting (standard and available on ISQ LT model only)
- Combination EI/PCI/NCI source used without interchange

Mass Filter

- Dual-stage mass filter with off-axis ion guide pre-filter for noise reduction and solid, homogeneous non-coated, maintenance-free quadrupole rods
- Independently heated zones for: transfer line, ion source, and ion optics/mass analyzer
- Fast quadrupole scanning up to 20,000 u/s

Mass Stability

- Better than 0.1 u/48 hours/ $\Delta T \leq 2$ K

Detector

- Triple off-axis Thermo Scientific™ DynaMax XR detection system, with off-axis 10 kV dynode, discrete dynode electron multiplier and electrometer, linear from 0 to 68 μ A
- Electronic dynamic range > 10⁹

Mass Range

- 1.2–1100 u with unit mass resolution

Acquisition Rate

- Ability to acquire more than 240 scans/s in SIM
- Ability to acquire more than 97 scans/s in FS when scanning over a range of 125 u

Pumping Systems

- Standard capacity (66 L/s) turbomolecular pump (ISQ QD GC-MS system)
- Extended capacity (300 L/s) turbomolecular pump (ISQ LT GC-MS and ISQ QD 300 GC-MS systems)
- Mechanical rotary vane 3.3 m³/h oil pump
- Optional oil-free scroll pump

CI Reagent Gas Capabilities

- Software-switchable dual reagent gas with digital flow control
- Ammonia, methane, isobutane and CO₂ presets

Electron Energy

- Adjustable from 0 eV to 150 eV

Emission Current

- Up to 350 μ A

Transfer Line Temperature

- Up to 400 °C

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TRACE 1300 Series Gas Chromatograph System

Please refer to GC system and autosampler specification sheets for additional and up-to-date details

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

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
- Detector Fast Data Acquisition Rate: up to 300 Hz

Autosamplers

- Thermo Scientific™ AI/AS 1310, Thermo Scientific™ TriPlus™ RSH, Thermo Scientific™ TriPlus™ 100 LS, Thermo Scientific™ TriPlus™ 300 HS, and more

Oven Performance

- Operating Range: Ambient +3 °C to 450 °C
- Cryogenic Option Minimum Temperature: -100 °C with LN₂; -50 °C with liquid CO₂
- 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

Hydrogen Kit Option

- Optional Hydrogen Kit (includes hydrogen sensor and ion volume) and extended capacity turbomolecular pump required for use with and standard installation specifications performed with hydrogen carrier gas on the TRACE 1300/1310 GC systems with the ISQ Series MS system

Instant Connect Helium Saver Module

- Compatible with any ISQ Series MS model connected to a TRACE 1300 Series GC system
- 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

Direct Sample Probe System Option (ISQ LT System Only)

- 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

Microfluidics Options for TRACE 1300/1310 GC Systems

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

Data System Software and Options

- Thermo Scientific™ Xcalibur™ Data system
- Thermo Scientific™ Dionex™ Chromeleon™ 7.2 CDS for chromatographers using MS
- Thermo Scientific™ TraceFinder™ Software for routine GC-MS quantitation
- TraceFinder Software for Environmental and Food Safety
- TraceFinder Software for Clinical Research
- TraceFinder Software for Forensic Toxicology
- AutoSIM (standard on ISQ LT; optional on ISQ QD)
- Instrument control and data connection via Ethernet
- Computer supplied with instrument equipped with three Ethernet (8P8C RJ-45) ports
- 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)

Standard Installation Specifications* ISQ LT and ISQ QD 300 (ISQ QD) Systems

Mode/Concentration	He	H ₂
In EI mode, 1 μ L of 1 pg/ μ L octafluoronaphthalene (OFN) will produce the following minimum signal-to-noise for <i>m/z</i> 272 when scanning 50–300 u	2,000:1 (750:1)	100:1
In PCI mode, 1 μ L of 100 pg/ μ L benzophenone will produce the following minimum signal-to-noise for <i>m/z</i> 183 when scanning 80–230 u using methane reagent gas	300:1	300:1
In NCI mode, 2 μ L of 100 fg/ μ L of OFN will produce the following minimum signal-to-noise for <i>m/z</i> 272 when scanning 50–300 u using methane reagent gas	2,000:1	600:1

Typical Specifications

In EI SIM mode, with He carrier gas and either the AI/AS 1310, TriPlus 100 LS, or TriPlus RSH autosampler (required and configured for liquid injections), eight sequential 100 fg OFN splitless injections monitored for *m/z* 272 produce the following instrument detection limit (IDL), calculated from the chromatographic peak area with 99% confidence interval: **IDL \leq 5 fg (ISQ LT GC-MS and ISQ QD 300 GC-MS); IDL \leq 10 fg (ISQ QD GC-MS)**

System Dimensions/Weights

Total width of the connected GC/MS system is 80 cm (31 in). Allow 16 cm (6 in) of clearance behind the instrument (32 cm if using autosampler). Additional space should be allotted for data system and printer.

Mass Spectrometer

(height \times width \times depth)
44 \times 33 \times 63 cm (17.5 \times 13 \times 24.5 in)
Weight: 43 kg (94 lbs)

TRACE 1300/1310 GC Systems

45 \times 44 \times 60/67 cm (18 \times 17 \times 24/26 in)
Weight: 35 kg (77 lbs)

* He (H₂) standard specifications are performed using a 15 (30) m \times 0.25 mm ID \times 0.25 μ m System Qualification Column (SQC). The installation specifications are performed with either He or H₂ but not both.

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