

Thermo Scientific TRACE GC Ultra

Multi-channel gas chromatograph

The Thermo Scientific TRACE GC Ultra is a multi-channel gas chromatograph, developed for the GC market's evolving requirements.

Besides offering the most complete range of proprietary inlets, sensitive detection systems, smart accessories, and ancillary devices, the Ultra platform also features unique technologies that raise the standard of Speed, Sensitivity and Separation in gas chromatography.

Unique Techniques

Ultra Fast

20 times faster analyses

The Thermo Scientific UltraFast GC column module featuring heat-up rates up to 1200 °C/min can dramatically shorten analysis cycles without compromising analytical resolution, precision, or reliability. Column modules are available for virtually any stationary phase.

Large Volume Splitless

50 times more sensitive

Large Volume injection capability up to 50 µL, available on a standard TRACE GC Ultra™ SSL injector, greatly extends sensitivity of conventional GC methods in a simple and effective fashion. 250 µL capability offered through the On-column and PTV options completes the offering by meeting all requirements for trace analysis.

Comprehensive Two Dimensional Gas Chromatography (GCxGC)

30 times higher peak capacity

Comprehensive Two Dimensional Gas Chromatographic approach (GCxGC) extends the separation capability of your TRACE GC Ultra. Thanks to the proprietary Dual Jet CO₂ Cryogenic Modulator (*) fully integrated in the GC you can experience the most advanced separation technology for most complex sample characterization.

(*) Sold under license from Zoex Corp. for thermal modulation



Ultra in Flexibility

In addition to a comprehensive range of injectors, the availability of a universal base body allows swift detector interchangeability and configurations with up to three detectors operating simultaneously, thus providing added value on your investment.

Ultra in Solutions

Combined with the Valve Oven, the TRACE GC Ultra delivers unmatched turn-key solutions even for the most demanding applications requiring multidimensional column switching techniques. Multiple packed or capillary columns, sampling and switching systems, and pressure regulators can all be effectively installed in an additional heated and readily accessible housing.

Ultra in Reliability

The new re-designed digital pneumatic modules assure highest accuracy and precision in carrier gas control. Besides, the proprietary Algorithm for Column Characterization grants utmost stability in both retention time repeatability and reproducibility.

Ultra in Automation

A vast array of automatic sampling systems (for liquid, headspace and SPME*) makes this GC able to withstand even the highest workload requirements, operating unattended around-the-clock. Instrument control and acquisition, enabled by Thermo Scientific proprietary or third party data systems, are further exploited by the internal LAN interfacing capability.

* Sold under license from Supelco®

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Features and Technical Specifications

Column Oven	Programmability: 7 Ramps/8 Plateaus. Temperature range: few degrees above ambient to 450 °C. Maximum Temperature ramp: 120 °C/min. Typical heat-up: from 50 °C to 450 °C in 420 seconds. Typical cool down: 450 °C to 50 °C in 250 seconds. Sub-ambient: -99 °C with liquid N ₂ , -55 °C with CO ₂ options.		
Injectors	Temperature range: 50-400 °C Heating rate: Up to 14.5 °C/sec (870°C/min). Programmability: 3 ramps/4 plateaus. Air-cooled down to few degrees above ambient temperature. Sub-ambient: -50 °C with liquid N ₂ , -30°C with CO ₂ options.		
Vaporizing Inlets SSL, Packed, Purged Packed B.E.S.T. PTV			
Non-Vaporizing Inlets Cold On-column	Septumless injector. No heating of the injector is required. Suitable for manual and automated operations. Cryogenic coolant not required.		
Large Volume Options	Up to 450 µL injectable volume. Uncorect type desolvation precolumn. Heated Solvent Vapor Exit valve. LVI software assistant for parameter optimization. Suitable for clean matrices.		
Large Volume Cold On-column			
Large Volume B.E.S.T. PTV	Up to 450 µL injection volume. Heated Solvent Split valve. Compatible with optional Backflush kit for PTV. Suitable for large volatility range samples in dirty matrices.		
Large Volume Splitless	Patented technology. Up to 50 µL injection volume. Compatible with manual or automated injections. Suitable for samples amenable to split-splitless injector.		
Inlet Pneumatics	Ambient Temperature and Pressure compensation. Gas saver. Assisted Leak Check Evaluation. Pressure surge. Proprietary Algorithm for Column Characterization (Linear velocity and Void Time calculation)		
Digital (250 and 1,000 kPa)			
Detectors	MDA	Linearity	Selectivity or additional features
Flame Ionization Detector	2 x 10 ⁻¹² gC/sec	Better than 10 ⁷	Flameout detection and timed programming capability. Acquisition rate 300 Hz
Thermal Conductivity Detector	600 pg Ethane/mL He	10 ⁶	Automated software switch function
Electron Capture Detector	< 10 fg of Lindane	Better than 10 ⁴	⁶³ Ni source, micro cell volume design
Nitrogen Phosphorus Detector	5 x 10 ⁻¹⁴ gN/s and 2 x 10 ⁻¹⁴ gP/s	Better than 10 ⁴	N/C = 10 ⁶ :1; P/C = 2 x 10 ⁵ :1
Flame Photometric Detector	1 x 10 ⁻¹³ gP/s and 10 ⁴ (P), 5 x 10 ⁻¹² gS/s (Malathion)	10 ³ (S) after linearization with suitable s/w	P/C=10 ⁶ :1; S/C=10 ⁵ :1 Dual flame photometric capability
Photo Ionization Detector	1 x 10 ⁻¹² g of Benzene 1.3 x 10 ⁻¹² g of Toluene	Better than 10 ⁵	Patented lamp cooling system for temperatures up to 400 °C
Pulsed Discharge Detector	Low pg range	10 ⁵	Non radioactive source
Digital pneumatics for detector gas controls			
Valve Oven	Independently heated valve housing able to accommodate up to 4 heated/2 unheated gas valves, 8 pressure regulators, 8 needle valves, In/out ports, packed and capillary columns. Maximum Temperature isothermal 175 °C.		
Ultra Fast GC	Only for SSL/FID or PTV-FID configurations. Heat up rate 1200 °C/min linear throughout entire Temperature range. Minimum Temperature: 40 °C. Maximum Temperature: 370 °C. 3 Ramps/4 Plateaus. Typical cool-down time: 370 °C to 50 °C in 1 minute.		
GCxGC	Proprietary CO ₂ Cryogenic Dual-Jet Modulator. Modulation Cycle time selectable up to 20 s in 0.1 s steps. Proprietary synchronization with acquisition frequency. Dedicated HyperChrom Data System for instrument control, data acquisition and reprocessing.		
System Automation	Compatible with SSL, B.E.S.T. PTV, PKD and PPKD Injectors. Maximum injectable volume 5 µL. Minimum 20 nanoliters with 0.5 µL syringe, "plunger-in-needle". Up to 8 sample vial capacity. Upgradable to AS 3000 II.		
Liquid sampling			
AI 3000 II			
AS 3000	Same as AI 3000 II but with up to 105 sample vial capacity.		
TriPlus AS II	Compatible with all injectors. 2x150 positions sample trays. Offers automated Large Volume injection capability up to 450 µL, solvent flush and internal standard injection modes. Available in "clone mode", with one sampling unit automating 2 adjacent GC or GC-MS. Upgradable to TriPlus Duo.		
Headspace Sampling	2 X 54-position trays. Heated syringe (Maximum Temperature: 150 °C). 6 position Incubation Oven with shaker and heating. Multiple Headspace Extraction (MHE) device available. Upgradable to TriPlus Duo.		
TriPlus™ HS			
Liquid and Headspace Sampling	Same as TriPlus AS and HS, offering both liquid and headspace sampling capability through 2 dedicated "snap-on" interchangeable turrets.		
TriPlus Duo			
Automated Sample Preparation	2 X 54-position sample trays. Variable fiber penetration depth, suitable for both liquid and headspace extraction. Optional 2-ports, inert gas purged, fiber conditioning station.		
TriPlus SPME			