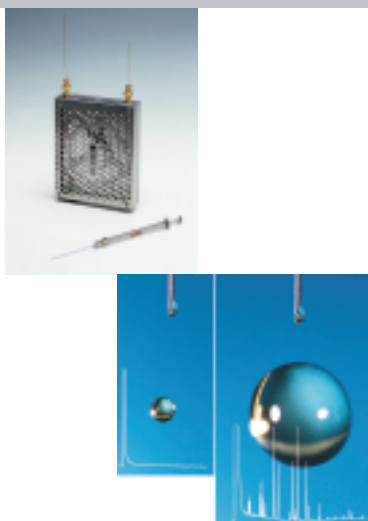


## TRACE GC Ultra

Productivity beyond limits

The TRACE GC Ultra™ is the new multi-channel gas chromatograph platform, developed as the solution to 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 is the FIRST commercially available instrument featuring two new technologies able to raise the standard of Speed and Sensitivity in Gas Chromatography!



### Unique Techniques

#### Ultra Fast

##### **20 times faster analyses**

The Ultra Fast 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 for the first time on your 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 complete the offering by meeting all requirements for trace analysis.

### 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 Performance

The simple, integrated Automatic Column Characterization available with the electronic gas flow controller grants utmost stability in both retention time repeatability and reproducibility.

### Ultra in Automation

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

## TRACE GC Ultra

### 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<sub>2</sub>, -55 °C with CO<sub>2</sub> options.

#### Injectors

Vaporizing Inlets  
SSL, Packed, Purged Packed  
B.E.S.T. PTV

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<sub>2</sub>, -30°C with CO<sub>2</sub> options.

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

Large Volume Cold On-column

Up to 450 µL injectable volume. Uncoret type desolvation precolumn. Heated Solvent Vapor Exit valve. LVI software assistant for parameter optimization. Suitable for clean matrices.

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

Digital (250 and 1,000 kPa)

Ambient Temperature and Pressure compensation. Gas saver. Automatic column characterization. Automatic leak check. Pressure surge.

Manual (600 kPa)

-

#### Detectors

Flame Ionization Detector

**MDA**  
2 x 10<sup>-12</sup> gC/sec

**Linearity**  
Better than 10<sup>7</sup>

**Selectivity or additional features**  
Flameout detection and timed programming capability. Acquisition rate 300 Hz

Thermal Conductivity Detector

600 pg Ethane/mL He

10<sup>6</sup>

Automated software switch function

Electron Capture Detector

< 10 fg of Lindane

Better than 10<sup>4</sup>

<sup>63</sup>Ni source, micro cell volume design

Nitrogen Phosphorus Detector

5 x 10<sup>-14</sup> gN/s and 2 x 10<sup>-14</sup> gP/s

Better than 10<sup>4</sup>

N/C = 10<sup>6</sup>:1; P/C = 2 x 10<sup>6</sup>:1

Flame Photometric Detector

1 x 10<sup>-13</sup> gP/s and 10<sup>4</sup> (P),  
5 x 10<sup>-12</sup> gS/s (Malathion)

10<sup>3</sup> (S) after linearization  
with suitable s/w

P/C=10<sup>6</sup>:1; S/C=10<sup>6</sup>:1  
Dual flame photometric capability

Photo Ionization Detector

1 x 10<sup>-12</sup> g of Benzene  
1.3 x 10<sup>-12</sup> g of Toluene

Better than 10<sup>6</sup>

Patented lamp cooling system for  
temperatures up to 400 °C

Pulsed Discharge Detector

Low pg range

10<sup>6</sup>

Non radioactive source

Manual and 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.

#### System Automation

Liquid sampling

AI 3000

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.

AS 3000

Same as AI 3000 but with up to 105 sample vial capacity.

TriPlus™ AS

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

TriPlus HS

2x54 positions sample 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.

Liquid and Headspace Sampling

TriPlus Duo

Same as TriPlus AS and HS, offering both liquid and headspace sampling capability through 2 dedicated "snap-on" interchangeable turrets.