

Eclipse 4660

Purge-and-Trap Sample Concentrator

The Gold Standard in Volatiles Analysis



- Patented Cyclone Water Management™* system removes >96% of water during the thermal desorb step allowing analysis of polar compounds
- Patented Foam Sensor™* and Foam Buster™** detect the presence of foam and disrupt it during the purge step to prevent system contamination
- Sparge Overfill Sensor (SOS™) prevents overfilling of the sparge vessel and system flooding
- Patented Infra-Sparge™* Sample Heater ensures consistent sparge vessel temperature conditions for improved compound recoveries and %RSDs
- Color touchscreen with Windows® CE software interface (English and Chinese languages)
- Optional pHDetect™** module automates sample pH measurement

Applications

- Drinking water
- Wastewater
- Groundwater
- Leaking Underground Storage Tank (LUST) monitoring
- Storm water
- Geosmin and 2-MIB
- Oxygenates

Methods

- USEPA 502.1, 502.2, 503.1, 524.2, 601, 602, 603, 624, 8010, 8015, 8020, 8021, 8030, 8260
- Massachusetts VPH and GRO methods
- ASTM and Standard Methods

Product Description

The Eclipse 4660 Purge-and-Trap Sample Concentrator processes samples for analysis of volatile organic compounds (VOCs) by gas chromatography (GC) or gas chromatography/mass spectrometry (GC/MS). Innovative, patented components within the Eclipse significantly improve sample processing steps of the purge-and-trap technique. A key technology is the built-in Cyclone Water Management system that removes water during the thermal desorb step. The high efficiency of water removal allows analysis of polar compounds such as alcohols, ethers, and ketones without interference from water. Degradation of chromatographic columns and maintenance of the GC or GC/MS are also minimized.

Operating Principle

The Eclipse purges (sparges) VOCs from liquid, solid, or gaseous (from a solid support) samples using a regulated flow of inert gas for a fixed time period. Analytes stripped from the sample (or transferred from an upstream autosampler) concentrate onto a cooled sorbent trap specific for the application. The trap heats rapidly and a valve switches, desorbing the analytes as a “plug” onto the GC column using a reversed carrier gas flow. The Cyclone Water Management system keeps water, which transferred from the sample matrix to the trap during sparging, within the concentrator. The water management fitting bakes and vents residual compounds and trapped water, reducing interference with subsequent reconcentration, separation, or detection of analytes.

* Patented

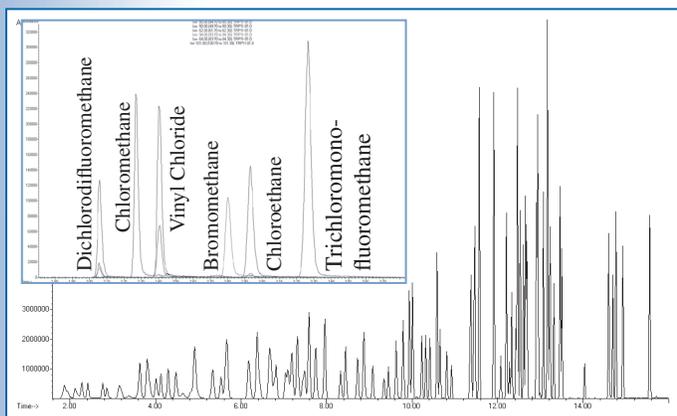
** Patent Pending

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General Specifications	
Dimensions	43.7 cm H x 26 cm W x 40.6 cm D (17.2" H x 10.2" W x 16" D)
Weight	14.5 kg (32 lbs)
Requirements	
Power requirements	115 VAC \pm 10%; 50/60 Hz; 230 VAC \pm 10%; 50/60 Hz: 750 VA maximum
Gas requirements	99.999% He or N ₂ purge gas
Safety/EMI Certifications	
Safety	Low Voltage Directive (73/23/EEC) IEC-61010-1:2001
EMC	Directive 89/336/EEC:1989 EN61326-1:A1:1998 EN61326-1:A2:2001
Supplementary information	EN61000-3-2 EN61000-3-3
Options	
pHDetect™ Foam Buster™ Foam Sensor™ Sparge Overfill Sensing (SOS™) Infra-Sparge™ Sample Heater Air-Tube Desorber Accessory On-Trap Injection Port Purge-and-trap Low-Dead-Volume Injector™ for GC	
Patents	
U.S. 5,250,093; 5,261,937; 5,337,619; 5,582,633; 5,817,128; 6,894,784B2	



The Eclipse was used to prepare a chromatogram of an expanded list of USEPA Method 8260 standard. It illustrates superb chromatographic performance with baseline resolution for all light gases and polar compounds, even with high-speed columns.

Performance Specifications	
Trap	3.175 mm O.D. x 2.667 mm I.D. (0.125" O.D. x 0.105" I.D.) Direct resistance heating Cooldown temperature: ambient +1 °C Heating rate: >1,000 °C/minute to 300 °C Maximum setpoint: 450 °C Cooling rate: >240 °C/minute (200 °C to 30 °C in <50 sec)
Water management	Eliminates all but approximately 0.25 μ L (0.063 μ L/minute) of trapped water (>96% water removed) [†] Maximum temperature: 240 °C Cooldown temperature: ambient +1 °C Water removal at level equivalent to condensation at 4.8 °C
Optional sample heater	Infrared lamp heating method In situ temperature measurement and feedback control Maximum sample heating rate: >35 °C/minute (5 mL); >17 °C/minute (25 mL) Temperature range: ambient to 200 °C (up to 350 °C with the Air-Tube Desorber) Inlet temperature: ambient to 200 °C
Sample pathway	Hydroguard™ 1/16" tubing Hydroguard transfer line: 48" standard; 60" optional
Programmable temperature ranges	Trap: ambient to 450 °C in purge, desorb, and bake Sample transfer line: ambient to 295 °C Valve oven: ambient to 350 °C Sparge mount: ambient to 200 °C Temperature accuracy: \pm 2% or \pm 2 °C (whichever is greater) for all heated zones Temperature stability: \pm 2 °C for all heated zones Optional sample heater: ambient to 200 °C (350 °C with the Air-Tube Desorber) Heated zones tested during system self-test
Electronic control	250 programmable methods with naming capability Method sequencing
Communications interface	Ethernet/LAN connection Full-color, Windows CE-based touchscreen graphical user interface Optional lower-cost, PC-only version Windows-based PC operation software package Internal communications by RS-232 and RS-485 connections
User interface languages	English, Chinese

[†] Under normal USEPA Method 502.2 times and temperatures.

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