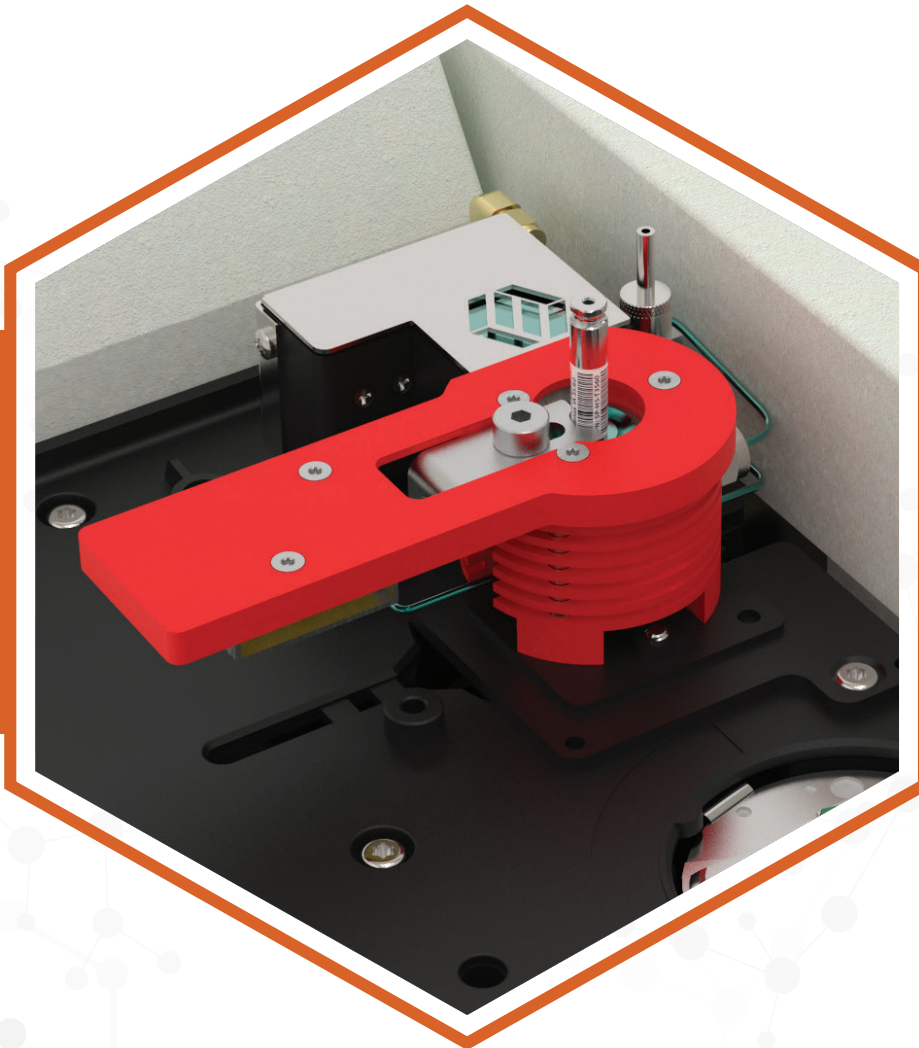
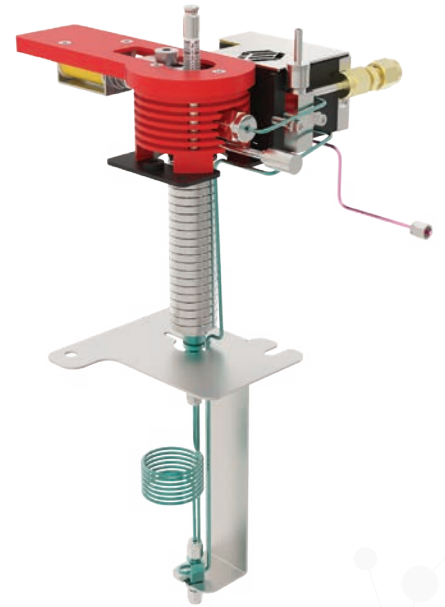




See What's Really There™



5800

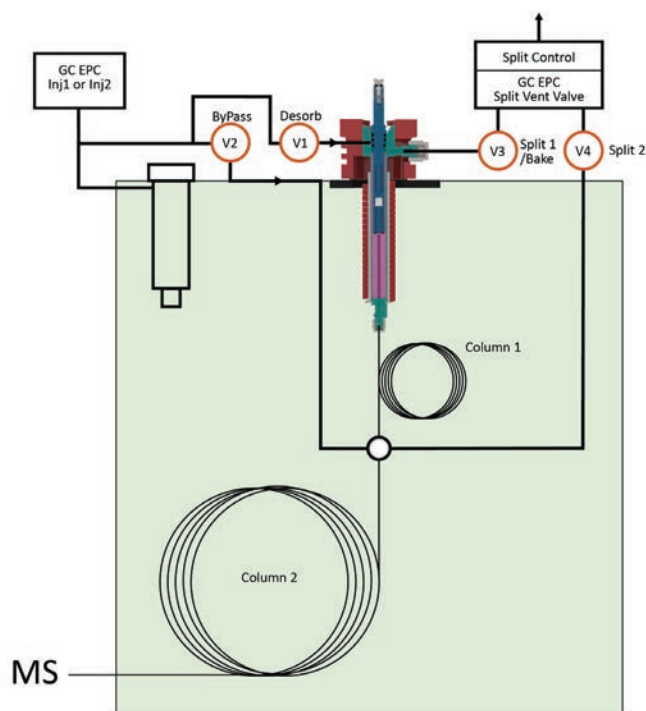
SORBENT PEN DESORPTION UNIT

*Next Generation Thermal Desorption Inlet
with Post Desorption Sample and Water
Management Performed Right in the GC Oven!*



5800 Sorbent Pen™ Desorption Unit

The 5800 SPDU is a thermal desorption system designed to reliably deliver samples collected on Sorbent Pens™ to a GC or GCMS. The unique design of the 5800 SPDU (multiple patents pending) includes a far shorter path length to the GC column than any other thermal tube desorption system (only 1-2cm), while supporting a dual GC column interface that allows additional sample preparation “inside the GC oven”, where losses due to cold spots are not possible. Most other thermal desorption systems desorb samples far away from the GC column, requiring rotary valves, long transfer lines, and often additional trapping to finally deliver the sample to the GC column. Long path lengths allow increased reactivity, and the opportunity for the deposition of very low vapor pressure compounds that will probably affect the transport of target compounds through those systems over time. The 5800 eliminates these concerns by desorbing samples directly into the GC, allowing consistent analytical results with minimal maintenance. The 5800 supports 3 injection modes, including SPLIT, SPLITLESS SVOC, and SPLITLESS VOC, all without any cryogenic or electronic cooling, so moisture can be managed while achieving optimum sensitivity and chromatographic resolution. All 4 types of Sorbent Pens are accommodated (HSP, FSP, DSP, & ASP), while maintaining a vertical position of the Sorbent Pens through the entire heating and cooling cycle to prevent the formation of gaps along the walls of the tube which often occurs with horizontally positioned desorbers, which in turn increases the potential for channeling during dynamic headspace sampling. The 5800 supports 2 split ports that are used for split injection, bakeout, backflushing, and focusing operations. The 5800 SPDU can be used manually, or combined with the Entech SPR40 Sample Prep Rail Autosampler for analysis of up to 240 Sorbent Pens unattended.

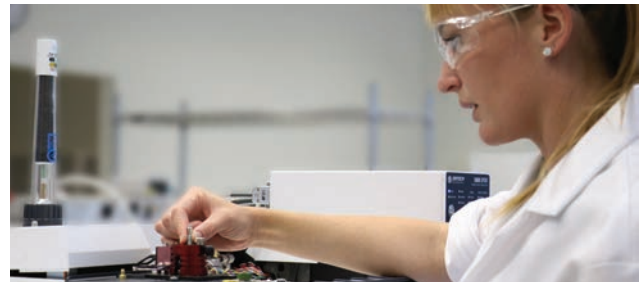
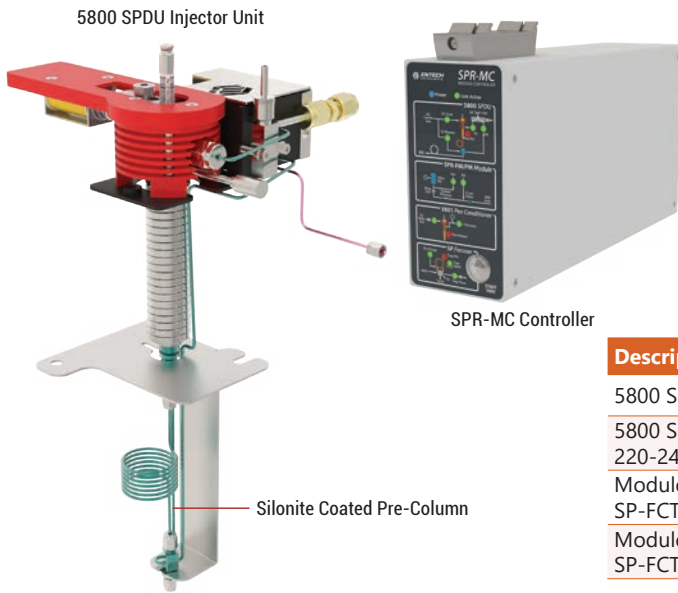


5800 SPDU - Easily transfers volatile and semi-volatile compounds to a GCMS for extremely sensitive and accurate headspace analysis.



- Direct thermal desorption of Sorbent Pens into all 3 major GC brands
- Avoids transfer lines and rotary valves, maximizing recovery and long term system stability
- Performs injections using SPLIT (VOC thru SVOC), SPLITLESS VOC, or SPLITLESS SVOC Modes for maximum flexibility, dynamic range, and sensitivity
- Backflushes to remove heavy, unwanted compounds to reduce both run times and thermal stress on GC columns
- Desorbs the sample within 1-2cm of the GC column, through an inert, easily replaceable Silonite coated glass liner
- Supports “Delayed Split Injections” to allow carrier gas pressures to equilibrate to improve split injection consistencies
- Maintains sorbent devices (Pens) in the vertical position to avoid “wall-gaps” when sorbents are cooled in a horizontal tube
- Operates using Entech SPRINT software, that orchestrates either manual injections or multi-sample automated analysis
- Takes thermal desorption technology to the next level of consistency and performance

5800 SPDU Ordering Information



Description	Unit	Part #
5800 Sorbent Pen Desorption Unit, 120VAC/60Hz	EA	5800-SPDU
5800 Sorbent Pen Desorption Unit High-Voltage, 220-240VAC/50Hz	EA	5800-SPDU-HV
Module Controller Supporting 5800, 3801, SPR-FM, & SP-FCTS (VOC Focuser), 120VAC/60Hz	EA	SPR-MC
Module Controller Supporting 5800, 3801, SPR-FM, & SP-FCTS (VOC Focuser), 220-240VAC/50Hz	EA	SPR-MC-HV

5800 SPDU Consumables and Replacement Parts

Description	Unit	Part #
Consumables & Replacement Parts		
HSP/FSP/DSP Silonite coated Glass Liner, For 0.53mm ID Column 1	EA	5800-LNR-HD-1mm
HSP/FSP/DSP Silonite coated Glass Liner, For 1/16" OD Column 1	EA	5800-LNR-HD-2mm
ASP Silonite coated Glass Liner, For 1/16" OD or 0.53mm ID Column 1	EA	5800-LNR-ASP-2mm
5800 Column1 - 2 Interface Manifold	EA	5800-C12-M
5800 Insert. Silonite Coated	EA	5800-INSERT
5800 Insert Locking Pin - Keeps 5800 Insert in place when removing Pens	EA	5800-INSERT-LOCPIN
Liner Spring - Keeps glass liner pressed against bottom of Pen during desorption	EA	5800-LNR-SPRING
5800 Spring Insertion Tool	EA	5800-Spring InsertTool
5800 Liner Extraction Tool	EA	5800-LNR-ExtTool
GC Model Mounting Kits* (Must select one)		
Thermo 1300 / 1310 GC	EA	5800-GC-TH
Agilent 6890 / 7890(B)	EA	5800-GC-AG
Shimadzu 2010 GC	EA	5800-GC-SH

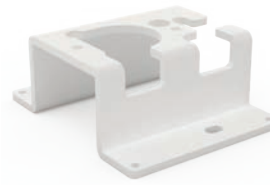
* Required component



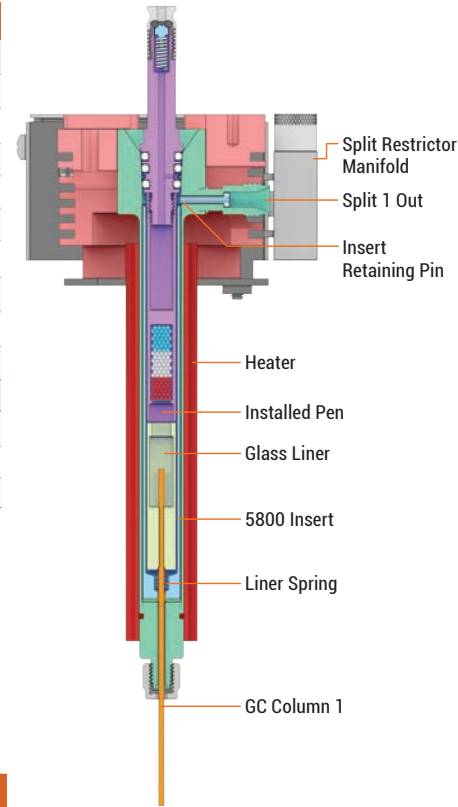
Thermo® Mounting Bracket



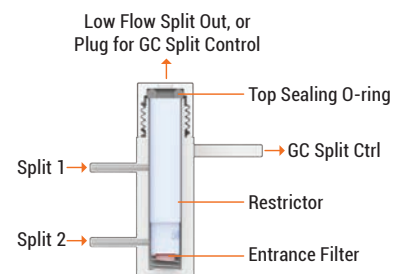
Agilent® Mounting Bracket



Shimadzu® Mounting Bracket



Description	Qty	Unit	Part #
Split Manifold and Restrictor Elements includes:			
Split Manifold Enclosure	1	EA	5800-SPLT
Split Manifold Cap	1	EA	5800-SPLT-M
Split Manifold #3 Restrictor (Approx xxx cc/min at 10psi Helium)	1	EA	5800-SPLT-R3
Split Manifold #4 Restrictor (Approx xxx cc/min at 10psi Helium)	1	EA	5800-SPLT-R4
Split Manifold #5 Restrictor (Approx xxx cc/min at 10psi Helium)	1	EA	5800-SPLT-R5
Split Manifold #6 Restrictor (Approx 7-12 cc/min at 10psi Helium)	1	EA	5800-SPLT-R6
Split Manifold #7 Restrictor (Approx 4-7 cc/min at 10psi Helium)	1	EA	5800-SPLT-R7
Split Manifold Plug (0 split flow to allow GC to control Split Flow)	1	EA	5800-SPLT-PLUG
Split Manifold O-ring Kit	1	EA	5800-SPLT-OR-KIT



Why Long Path Thermal Desorption is Not Optimal

When performing thermal desorption, the sample often contains compounds ranging from very low to very high boiling points, to even include waxes depending on the conditions under which the sample was collected on the sorbent. When taking air samples, 7-10 ring aromatic compounds can be attached to particulates that are drawn onto the sorbent tube, and many non-volatile compounds (pollen, spores, mold/plant fragments, etc.) can thermally decompose to release very heavy organic compounds, and these can be partially recovered off of TD tubes when desorbed at 250-350° C. However, they are typically too heavy to travel through long transfer lines, rotary valves, and additional focusing sorbents in systems that do not desorb TD samples directly into a GC oven. Over time, this creates a film buildup in these systems that will start to adsorb/absorb lighter compounds of interest, requiring substantial and costly system repair to reestablish the initial system performance. The 5800 addresses this TD dilemma by desorbing the sample directly onto the first of two GC columns “inside” of the GC oven, with subsequent backflushing of this first column when the GC approaches its maximum method temperatures, which is generally as high as the TD tube thermal desorption temperatures, thereby minimizing any buildup. Eventually, if a buildup does occur, simply cut off 10cm of the first column (SPLITLESS SVOC mode), or replace it altogether along with the 5800 glass liner to restore the flowpath to a “like new” condition. This translates into not only better system performance overall due to short path lengths to the GC column, but long term it provides a renewable solution that provides consistent performance for many years. Rather than chasing problems that are preventing the complete range of target compounds to be recovered properly, the 5800 “GC Direct” strategy reduces the number of variables so that labs achieve optimal results longer, and with far less maintenance.



Sorbent Pen™
Thermal Conditioner

3801 SPTC Sorbent Pen Thermal Conditioner

The 3801 Sorbent Pen Thermal Conditioner can be used to perform a clean up of Sorbent Pens before initial use, when the Pens have been left out exposed to the air without being capped off, or when the Pens are exposed to especially high concentration samples. The 3801 generally isn't needed to perform thermal conditioning of Pens after every analysis, as the desorption and bakeout in the 5800 SPDU is usually sufficient to clean Pens up to very low background levels. The 3801 SPTC is controlled through a SPRINT software interface using the same SPR-MC unit that controls the 5800 SPDU. The 3801 can be operated manually, or in an automated mode when using the Entech SPR40 Sample Preparation Rail. Alternatively, the 3830 can clean up to 30 Pens simultaneously for higher production laboratory operations.

Description	Qty	Unit	Part #
Sorbent Pen Conditioning			
3801 Sorbent Pen Thermal Conditioner, 120VAC/60Hz	1	EA	3801-SPTC
3801 Sorbent Pen Thermal Conditioner, 230VAC/50Hz	1	EA	3801-SPTC-HV

SideBar Organizer for 5800/3801 Solutions

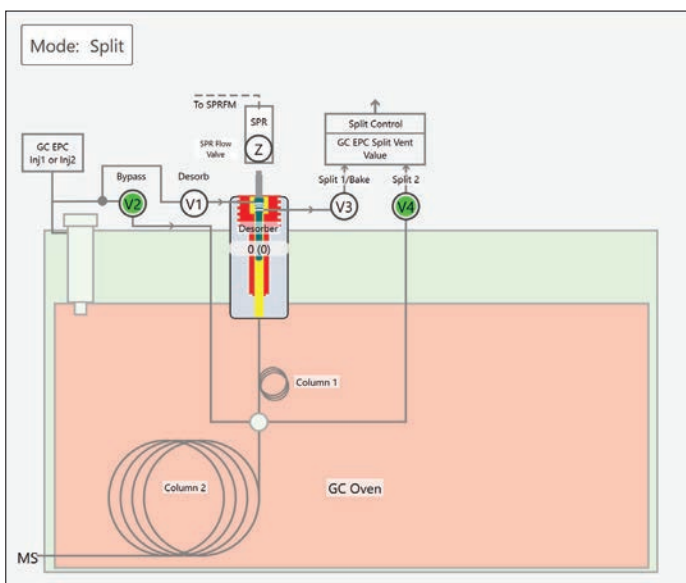
The SideBar from Entech is a rail organizer that uses the same clamping system as used by the SPR40 Sample Preparation Rail from Entech. The SideBar holds the SPR-MC Controller, the 3801 Thermal Conditioner, a few Pens or even a whole tray of Pens in close proximity to the 5800 SPDU, to support an organized approach for manual Pen analysis. The SideBar stays out of the way of liquid autosamplers and other equipment on the GC/GCMS, to make it easier to go back and forth between applications. Bring the power of the Sorbent Pen into your laboratory using the SideBar, and then move up to the fully automated SPR40 Robotic Autosampler when sample quantities increase.



ENTECH SIDEBAR

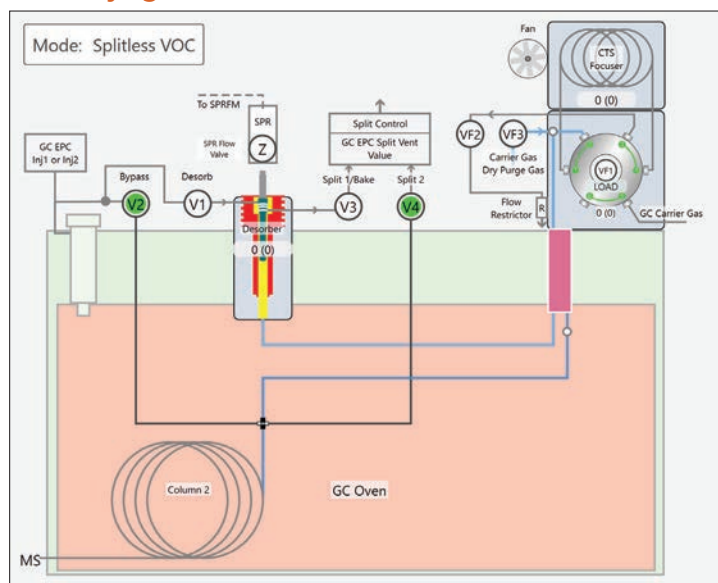
Description	Unit	Part #
SideBar Assembly		
SideBar Assembly for Thermo® GC	EA	SP-SIDEBAR-TH
SideBar Assembly for Agilent® GC	EA	SP-SIDEBAR-AG
SideBar Assembly for Shimadzu® GC	EA	SP-SIDEBAR-SH

SPLIT and SPLITLESS SVOC Mode



SPLIT Mode: Column 1 - 0.6m x 1mm ID Silonite Column
SPLITLESS SVOC Mode: Column 1 - 3-10m x 0.53mm ID x 0.1-0.25um

SPLITLESS VOC Mode using Cryogen Free SP-FCTS Focuser Module



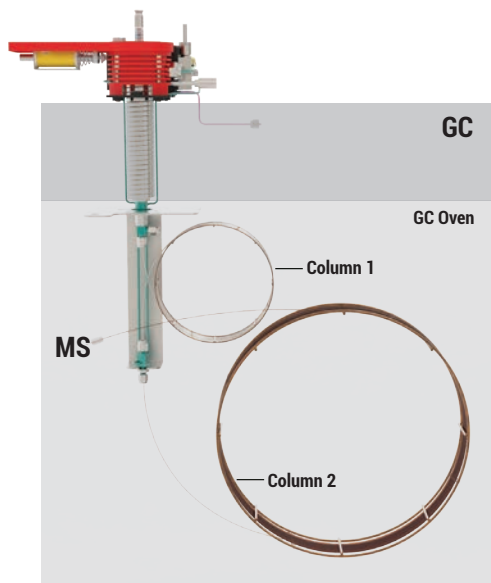
SP-FCTS "Platypus" Focuser

The new SP-FCTS Non-Cryogenic, Non-Electronically cooled, Multi-Column Capillary Trap Focusing System is so "different" than any other focusing system found in GC introduction systems, that we had to give it a name that was different and unusual as it is. Meet the new Platypus from Entech. Just like the Platypus is very much at home in the water, the new SP-FCTS is capable of dealing with "Lots" of water while performing a focused, splitless injection of compounds boiling as low as -50° C. Simply add the Platypus to your 5800 SPDU system, and start desorbing wet Sorbent Pens to this remarkable trap and see how it gets rid of moisture...like water off a duck's or Platypus' back. An initial stage reduces the relative humidity of the desorbed sample low enough to allow the rest of the water to "chromatographically" pass right through the multi-capillary column trapping system (MCCTS), followed by preheating and back desorption off the MCCTS directly to the GC column. Scanning for water shows levels literally hundreds of times below dry purged packed traps, simply because the volume of particles coating the walls of the capillary columns are hundreds of times smaller, so water purges out much faster. The SP-FCTS (aka Platypus) and Sorbent Pen combine to create a solution that is 30x more sensitive than dynamically trapped samples that must split at 30:1 both to manage water and to create reasonable on-column peak widths. Try the 5800/SP-FCTS solution, and see just how well the Platypus can improve water management and overall VOC sensitivity.



Description	Qty	Unit	Part #
Fan Cooled Multi-Capillary Column Focusing System			
Platypus Module, 120VAC/60Hz	1	EA	SP-FCTS
Platypus Module, 220-240VAC/50Hz	1	EA	SP-FCTS-HV

5800 SORBENT PEN™ DESORPTION UNIT SPECIFICATIONS



The Entech 5800 SPDU is a unique thermal desorption system that uses multiple columns in the GC oven to either concentrate the sample, or perform a time delayed split injection to optimize GC capillary column loading. The 5800 SPDU completely eliminates transfer lines, secondary packed traps, and rotary valves found in other thermal desorption systems, and allows backflushing of the first column to optimize system cleanliness.

Thermal desorption / Sample Introduction Options

- VASE - Vacuum Assisted Sorbent Extraction as a quantitative replacement for SPME
- FEVE - Full Evaporative Vacuum Extraction for comprehensive analysis of mid-range VOCs through SVOCs in water and other volatile matrices
- MA-VASE; Matrix Accelerated VASE for improved recoveries without aerosol formation
- Flash-VASE; Vacuum Thermal Extraction of solids and low volatility liquids
- Hi-Temp Flash VASE for vacuum extraction of particulate filters used to collect PAHs and other SVOCs
- LVSH - Large Volume Static Headspace analysis of aromas and off flavor compounds using ASP Sorbent Pens
- Analysis of new hybrid WCOT Capillary / Packed ASP Sorbent Pens for enhanced recovery of SVOCs in air to include gas-phase and particulate adsorbed organics
- Analysis of Diffusive Sorbent Pens for trace analysis of BTEX and other compounds in air
- Analysis of Next Generation Vacu-Pen and Diffusive Vial Samplers for active and diffusive air monitoring of VOCs and SVOCs

Compatibility

- Compatible with Agilent®, Thermo Scientific®, & Shimadzu® GC/GCMS systems

Temperature Programming

- Two temperature desorption setpoints
- Heating rates up to 450 °C/min
- Gold-plated copper sleeve maximizes thermal consistency
- Initial temperature 50-350 °C
- First desorb temperature 50-350 °C
- Second desorb temperature 50-350 °C
- Hold time maximum 60 minutes

Sample Injection Modes

- SPLIT - VOC through SVOC analysis
- SPLITLESS VOC - Trace VOC Analysis
- SPLITLESS SVOC - Trace SVOC Analysis

Desorption Temperature

- Maximum 350° C

Pre-Purge Prior to Desorption

- SPR40 Dry Purge and "Top of Pen" Pre-Purge" prior to desorption to eliminate air and moisture

Control

- SPRINT software running concurrently with the GCMS software
- Controlled through SPR-MC rail mounted controller

Automation

- Automated using the Entech SPR40 - Sample Preparation Rail
- SPR trays hold up to 30 Sorbent Pens. Up to 8 trays can be supported (240 samples)

Environmental Conditions

- 10 to 35 °C
- Relative Humidity 15-85%

Dimensions (W × H × D)

- 71 × 277 × 76mm

Weight

- 0.4 kg

Power Consumption

- Max. 410W (to include four 2.5W Clippard Valves)
- Avg. 90 W
- Stdby 5-15W

Thermal Desorption Media

Sorbent Pens:

- HSP - Headspace Sorbent Pens (3.5" L x 1/4" D)
- FSP - FEVE/Flash-VASE Sorbent Pens (3.5"L x 1/4"D)
- DSP - Diffusive Sorbent Pens (3.5"L x 1/4" D)
- ASP - Active Sorbent Pens (4.35"L x 1/4" D)

Features and Options

- 3 Operational Modes: SPLIT, SPLITLESS VOC, SPLITLESS SVOC
- Focusing Option: SP-FCTS Multi-Capillary Column Trap Supporting Moisture Elimination
- Low Split Flow Control manifold for split operation at 1-20cc/min
- High Split Flow Control through GC Pressure Control System (10-200cc/min)

SPR-MC Controller

- Controls Heaters/Valves/Sensors in
 - 5800 SPDU
 - 3801 SP Thermal Conditioner
 - SPR-FM Flow Module for Automated DSP/ASP Pen Spiking
 - SP-FCTS Multi-Capillary Column VOC Focuser
- Front LEDs for Heater/Valve Ctrl Visual Feedback
- Dimensions: (W x H x D) 75 x 147 x 298mm
- Weight: 1.8 kg

SPRINT Software

- Controls operation either manually or through SPR40 rail autosampler
- Supports forward dry purge, Pen bakeout, and column backflushing

Supported Techniques

Headspace using VASE/FEVE

Principle

Thermal desorption of analytes on Entech Headspace Sorbent Pens collected using either VASE - Vacuum Assisted Sorbent Extraction, or FEVE - Full Evaporative Vacuum Extraction.

Features

- Samples are collected under vacuum, to maximize and speed up recovery during headspace extraction
- Compounds are extracted at or near thermalized molecular diffusion rates to eliminate channeling into the sorbent, improving recovery and virtually eliminating carryover
- Sample is delivered through an inert liner directly onto the GC pre-column
- Split or Splitless Desorption
- Dry Purge Operation Supported
- SPLIT and SPLITLESS Modes Supported
- Adsorbent Bakeout occurs automatically during desorption process, bypassing the GC column

Applications

- Headspace analysis of compounds boiling from -50 °C to +450 °C using VASE - Vacuum Assisted Sorbent Extraction, including volatiles in water, flavors, fragrances, volatiles to semi-volatiles in materials. A more quantitative and sensitive alternative to SPME
- Headspace analysis of compounds boiling from 150 °C to 600 °C using FEVE - Full Evaporative Vacuum Extraction, including VOCs to SVOCs in water and a variety of other matrices without the use of solvents

Standard Liquid Support

- Isolation sleeves support the addition of Calibration or Internal Standards onto the front of the Sorbent bed prior to analysis
- Analyte derivatization during extraction

Required Supplies

Entech HSP and FSP Sorbent Pens for:

- Headspace Vacuum Extraction

Commonly Used Adsorbents

- Tenax TA™
- PDMS + Tenax TA
- Tenax TA + Carboxen 1000
- Tenax TA + Carbopack X

Automation

- Entech SPR40 Robotic Rail Autosampler
- 8 trays max at 30 samples per tray

Vacuum Thermal Extraction

Principle

Flash-VASE allows thermal extraction of samples from 30-280 °C for transfer of volatile compounds into a Sorbent Pen positioned at the top of the vial. Far cleaner and safer than direct thermal extraction into a GC. Reduced potential for system contamination relative to micro chamber / purge and transfer techniques.

Features

- Liquid or Solid samples are loaded into 2, 10, or 20mL vials
- Extraction sleeves and Sorbent Pens are connected to the vials, and the assembly is pulled under a strong vacuum
- Sample vials are heated between 30 to 280 °C for 2-10 minutes (or longer)
- Optional cold tray allows moisture to be drawn back into sample vial after thermal extraction
- Analysis performed by SPLIT or SPLITLESS injection modes

Applications

Rapid detection of compounds emitting from materials at low to high temperatures, without having to perform solvent extractions. Potential screening of contaminants in Polymers, Cannabis, and other materials. Analysis of low volatility liquids (oils, etc). Analysis of packaging for regulatory contaminants, or odor producing compounds. Extractables part of "Leachables/Extractables" determination.

Required Supplies

- Flash-VASE10 Module extracts 10 vials simultaneously
- HSP/FSP Sorbent Pens
- 2, 10, 20mL Vials
- Flash-VASE6 Module for 6 x 40mL Vials
- Extraction sleeves/hardware for specific vial size used

Automation

- Entech SPR40 Robotic Rail Autosampler
- 8 trays max at 30 samples per tray

Large Volume Static Headspace

Principle

Collection of a large headspace volume under static conditions to provide analysis down to olfactory detection limits. Determines quantitatively the concentrations in the headspace, rather than concentrations in a liquid or solid sample.

Features

- Utilizes ASP Sorbent Pens, uses ASP Sorbent Pens to collect an equilibrated headspace sample from a 250,500, or 1000mL vial or bottle, as measured by the SPR-FM option on an SPR40 Autosampler.

- With both Splitless VOC and Splitless SVOC Modes, virtually 100% of the contents of the tube are delivered into the analytical GC column, and subsequently to the detector.
- Ideal for the analysis of static equilibrated vapors above a sample, instead of disrupting the equilibrium of the headspace by removing chemicals from the headspace causing more compounds to come out of the liquid or solid matrix.

Applications

- Food & Flavor – Food / Flavor / Beverage Analysis
- Fragrance Analysis – Botanicals, Extracts, Consumer Products
- Product Testing – Static Emission Determination
- Forensics – Accelerants
- Odor Evaluation – Consumer Products

Standard Liquid Support

- Isolation sleeves support the addition of Calibration or Internal Standards onto the front of the Sorbent bed prior to analysis
- Supports gas phase spiking of volatiles, or syringe spiking of SVOCs prior to analysis

Required Supplies

- ASP Sorbent Pens
- Large vials (250, 500, 1000mL) with Pen vacuum sleeve interface
- SPR40 Autosampler with SPR-FM Flow Module
- Large Volume Vial platform and trays
- Pen Spiking Ports

Thermal Desorption of Air Monitoring Tubes

Principle

Analysis of thermal desorption tubes used to sample air either actively or diffusively, using ASP - Active Sorbent Pens, or DSP - Diffusive Sorbent Pens.

Features

- Uses advanced active sampling sorbent cartridge design that effectively recovers heavy SVOCs in air, by capturing air particles on an initial capillary stage for superior recovery of heavy organics known to be adsorbed on the particle phase (patent pending)
- Split / Splitless desorption
- Dry purge option
- Pressurized leak check option
- Adsorbent bakeout occurs automatically after desorption process, bypassing the GC column

Applications

Thermal Desorption of analytes collected on single or multi-staged adsorbents during air monitoring, Desorption of other volatiles and semi-volatiles collected from indoor air, chamber outgassing studies, adsorption from Tedlar bag samples, etc.

Standard Liquid Support

- Isolation sleeves support the addition of Calibration or Internal Standards onto the front of the Sorbent bed prior to analysis
- Supports gas phase spiking of volatiles, or syringe spiking of SVOCs prior to analysis

Required Supplies

Entech Sorbent Pens for:

- ASP Sorbent Pens for active sampling of air or headspace
- Accu-Bottle Samplers or low flow metering pumps for air volume measurements
- DSP Sorbent Pens for diffusive sampling of indoor, outdoor, or workplace air

Commonly Used Adsorbents

- Tenax TA™
- PDMS + Tenax TA
- Tenax TA + Carboxen 1000
- Tenax TA + Carbopack X
- Carboxen® 1000
- Carbopack X
- Tenax TA, Carbopack B, Carboxen 1000

Automation

- Entech SPR Robotic Rail Autosampler
- 8 trays max at 30 samples per tray



Sorbent Pens™ - Achieving the Full Potential of Clean Headspace Extractions in Virtually All Sample Matrices

Learn more about us:



entechinst.com



facebook.com/entechinst



twitter.com/entechinst



linkedin.com/company/entech-instruments-inc

Entech Instruments
2207 Agate Court
Simi Valley, CA 93065
Phone: 805-527-5939
5800 SPDU – 210927 -1.0