

**T**he patented Fluidless Column Oven (FCO) accessory is now available for all models of DPS Gas Chromatographs. The FCO is a device that can easily be built-in to any of our GC's for Fast analyses, which are up to 10 times faster than our with air bath ovens. To achieve such speeds this unique device places a steady state temperature profile on the analytical column using a series of gradient heaters. With the FCO no "fluid" is needed to either heat or cool the column, eliminating the normal temperature cycling found in our standard GC oven. Once you eliminate the temperature cycle one sample can be analyzed directly after another, making all of our GC's Super-Fast GC's!

Unlike other Fast GC methods, which may have limitations on column length and diameter, any analytical column can be used with the FCO, including packed columns, making the FCO the most versatile column oven on the market. The FCO can be installed, or changed by simply connecting the column to the injector and detector and the heater cables to the control board. The control module handles the temperatures and stores the methods, which can be updated and viewed on the built-in touchscreen.

# Fluidless GC Column Ovens



**Companion 2 GC**



**Series 600 GC**

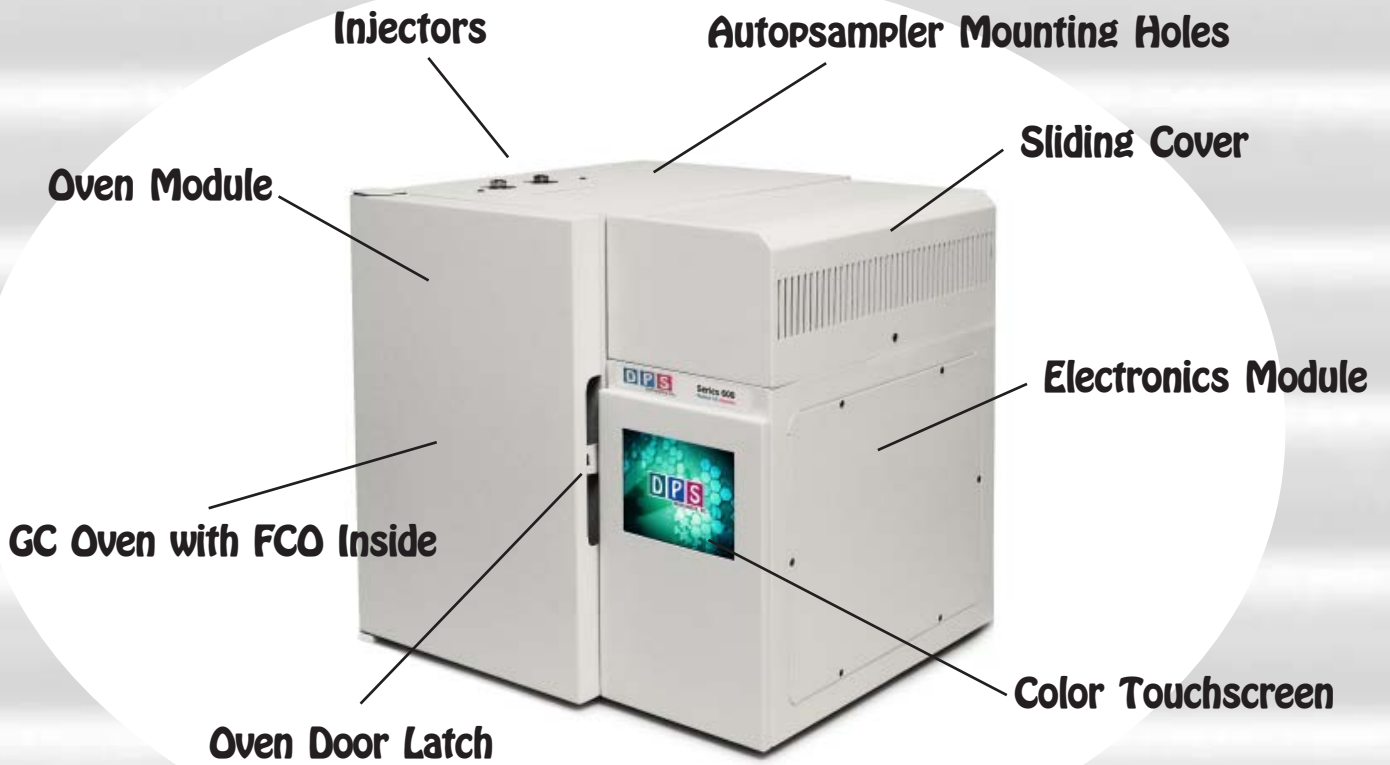
**1 FCO for a Single Oven...  
2 FCO's for a Dual Oven...**

### **General Specifications:**

- Built-in FCO Module(s)
- Gradient Temperature Profiles
- Use any Packed or Capillary Column
- Injection Temperature Set-point to 450 C
- Detector Temperature Set-point from Ambient
- Hundreds of Analytical Methods
- No Temperature Cycling
- Retention Times equal to an Isothermal Run
- Super-charged analyses - up to 10 times Faster
- Fast, Simple, Easy & Reliable!



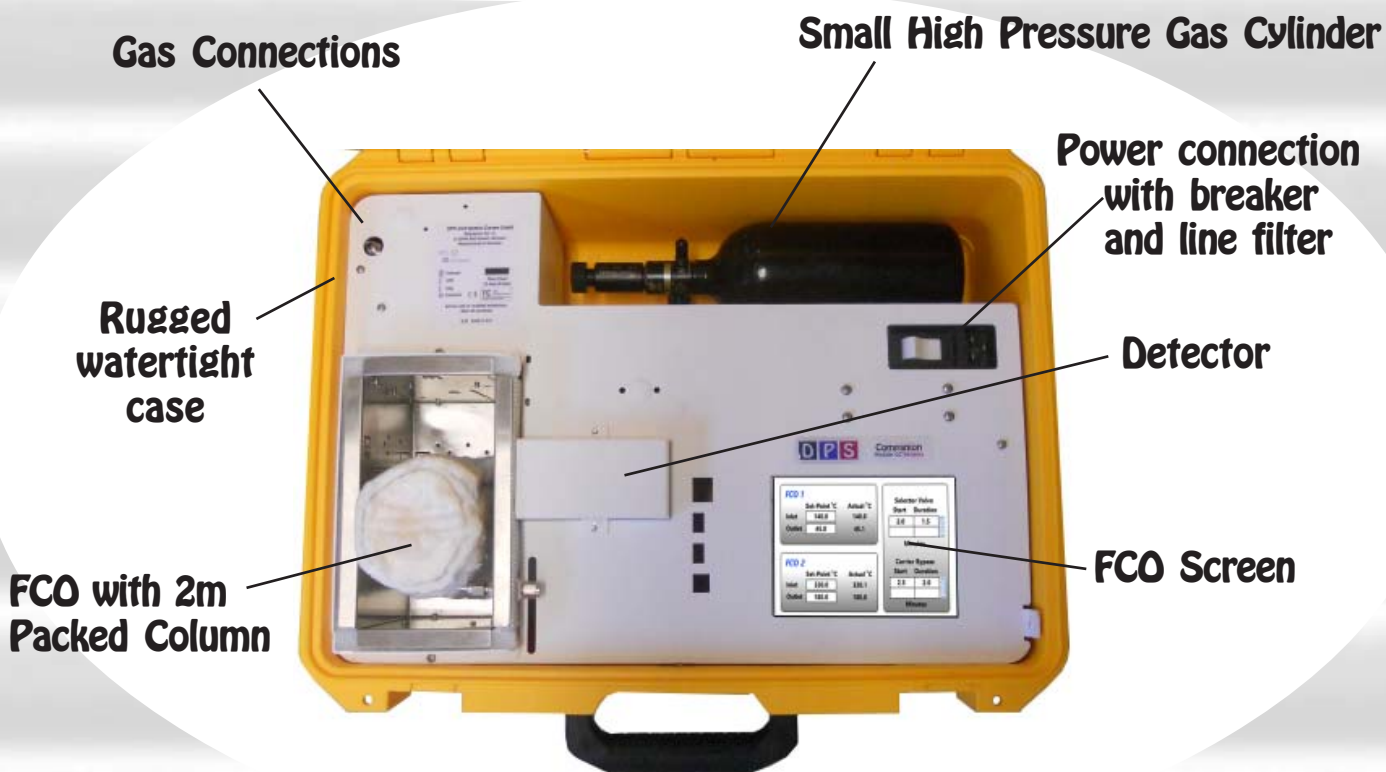
# DPS Series 600 Layout - 1 or 2 FCO's



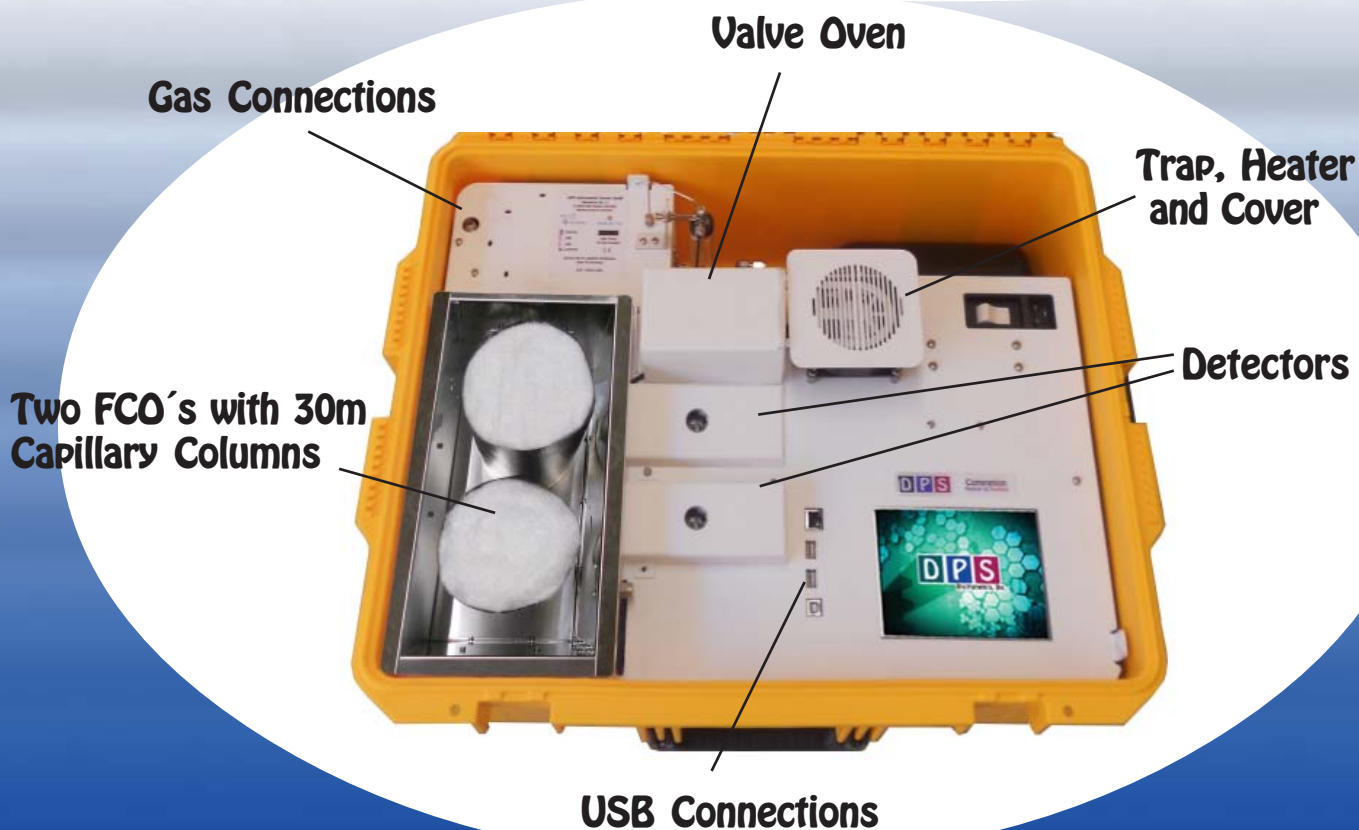
## Series 600 Autosamplers



## DPS Companion 1 Layout - only 1 FCO

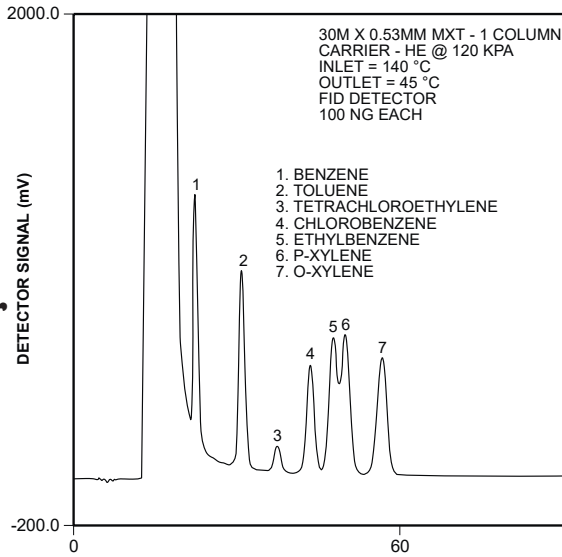


## DPS Companion 2 Layout - 1 or 2 FCO's

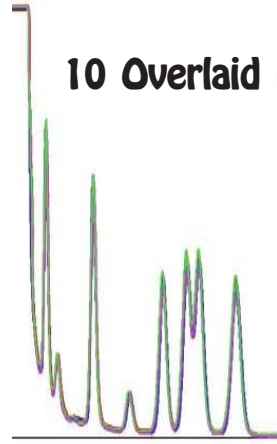


# Fast BTEX Analyses

**1 min BTEX  
60 Runs/hour**



**10 Overlaid Runs**

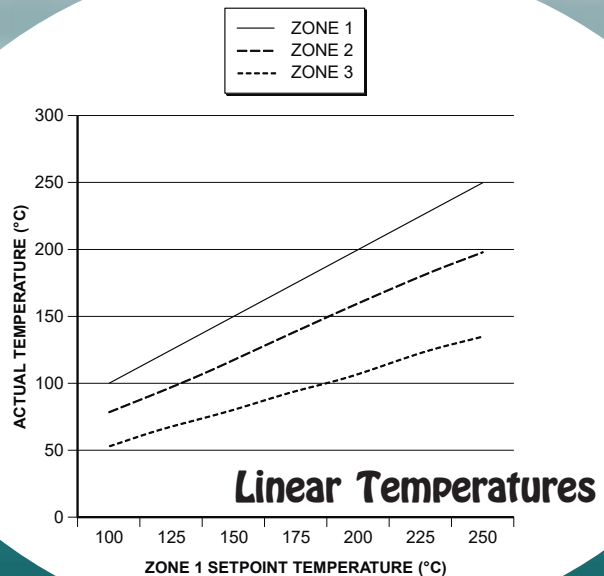


**Stable and Reproducible**

**FCO's for Companion 1 & 2  
Portable GC's**



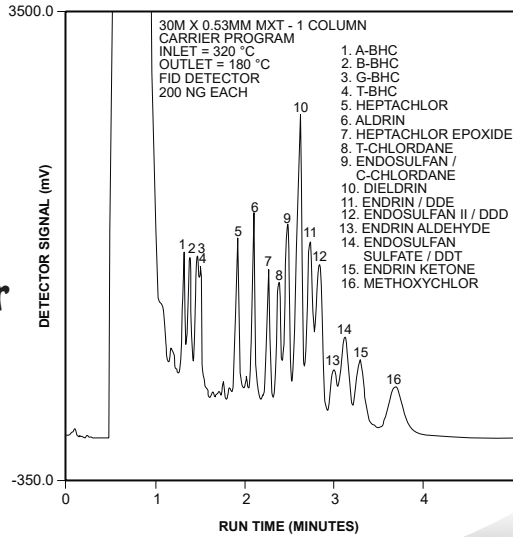
**Gradient  
Temperature Profiles**





# Fast Pesticides Analyses

**4 min Runs  
15 Runs/hour**



**FCO's for Series 600  
Laboratory GC's**

**FCO 1 -  
First Column**

**FCO 2 -  
Second Column**

FCO Method

**BTEX-Pesticides** Save

FCO 1		Set-Point °C	Actual °C
Inlet	140.0	140.0	140.0
Outlet	45.0	45.0	45.1

Selector Valve		Start	Duration
		2.0	1.5
Minutes			

FCO 2		Set-Point °C	Actual °C
Inlet	320.0	320.0	320.1
Outlet	180.0	180.0	180.0

Carrier Bypass		Start	Duration
		2.5	2.0
Minutes			

**Switching Valve  
for 2-D**

**Carrier Bypass  
for 2-D**

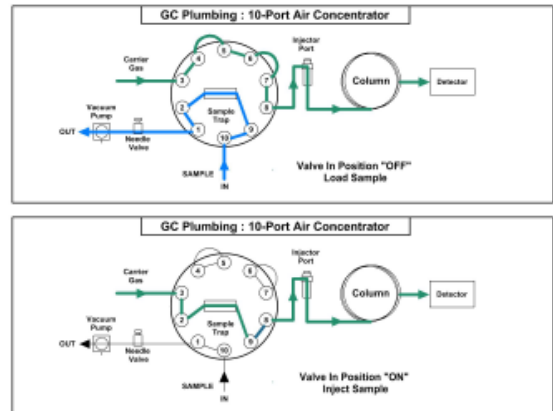
**FCO Control Software**

# Sample Concentrators

**Air Concentrator** - The air concentrators for Companions and Series 600 GC's are built right in to provide both a compact portable sample concentrator and a shortest possible sample path. The valve and sample lines are heated creating an inert sample path. The sample trap is plumbed in a true backflush fashion and the sample trap also can be equipped with a variety of packing materials to achieve the best concentration of the compounds being analyzed. The sample is loaded with the built-in vacuum pump and regulated with a variable flow controller for consistent sample trapping. The entire sequence of the Air Sample Concentrator is automated through the Timeline of the DPS Control Software for the analysis of one sample, or the system can be set up to run unattended 24/7, collecting and analyzing samples every hour, or so.

**Load** - The vacuum pump draws the sample from the inlet through the Trap and then to the flow controller and pump to limit any possible cross contamination between samples.

**Inject** - The carrier gas sweeps the components from the trap to the analytical column.



**Air Concentrator Plumbing Diagram**



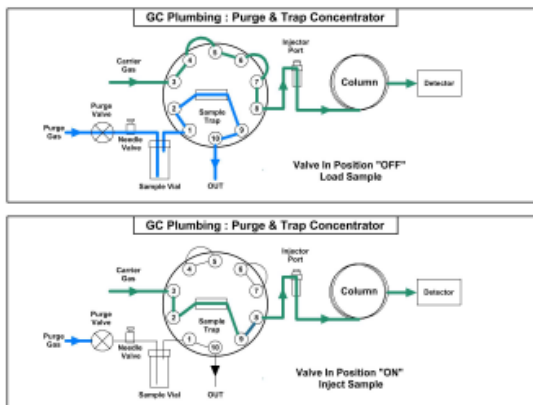
Change Vials through Cover



**Purge & Trap Concentrator** - The Purge & Trap Concentrator for the Companions and Series 600 GC's are built right in with the same Trap features as the Air Concentrator. The water sample is purged with inert gas to extract the sample compounds and load them onto the Trap. The Purge Gas is regulated with a variable flow controller for consistent sample trapping. The entire sequence of the Purge & Trap Concentrator is automated through the Timeline of the DPS Control Software for the analysis of one sample at a time.

**Load** - The Purge Valve turns ON to start the stream of gas flowing to the Purge Vial. With this configuration the flow controller is up stream from the Trap to limit any possible cross contamination between samples.

**Inject** - The carrier gas sweeps the components from the trap to the analytical column. With the Purge Valve OFF there is no flow through the other side of the valve. The Purge Valve can be turned ON to blow out the sample lines using a blank Vial.

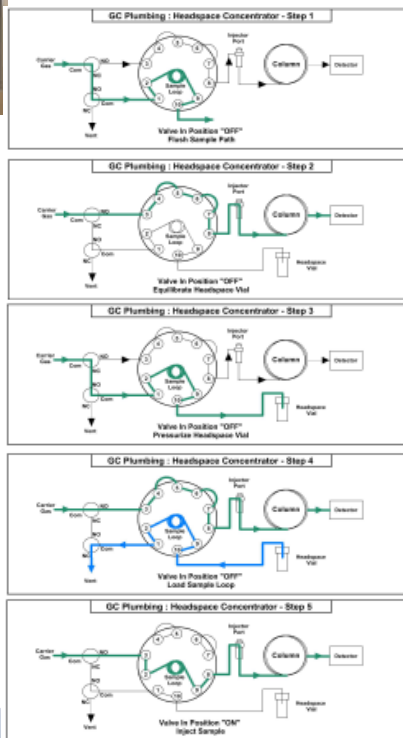


**Purge & Trap Concentrator Plumbing Diagram**

Access Vials through Cover



Headspace Plumbing Diagram



**Headspace Concentrator** - The Headspace Concentrator for the Companions and Series 600 GC's are built right in to provide the shortest possible sample path. The Sample Vial is heated and then consistently Pressurized before loading the Sample Loop. A fixed Sample Loop ensures reproducible sampling and the sample lines are flushed between analyses to limit any cross over contamination. The entire sequence of the Headspace Concentrator is automated through the Timeline sequence of the DPS GC Control Software for the analysis of one sample at a time.

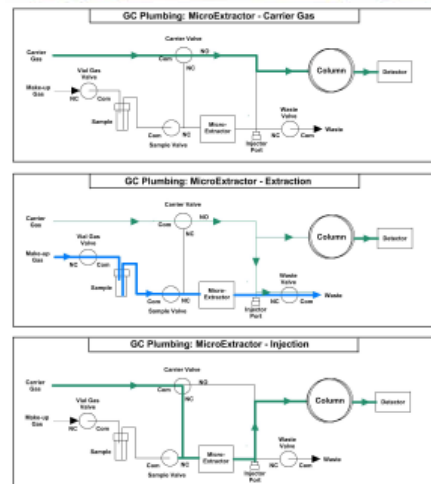
**Plumbing Diagram** - In the 1st sequence the carrier gas is diverted to Flush out the Sample Lines. The Sample Probe is then inserted into the Headspace Vial. During the 2nd step the carrier gas flows to the analytical column and the Headspace Vial is heated with the Vial Heater and allowed to equilibrate. During the 3rd step the Headspace Vial is pressurized for a few seconds. In the 4th step the sample is loaded onto the Sample Loop by releasing the pressure in the headspace vial. In the 5th step the Sample Valve is rotated to the ON position and the carrier gas sweeps the components from the Sample Loop onto the analytical column.

**MicroExtractor Concentrator** - The MicroExtractor concentrator is a exciting innovation exclusively from DPS that concentrates higher boiling compounds directly from water samples. The sample vial is pressurized and the water sample is pushed through the trap at ambient temperature where the compounds are concentrated. Later the trap is heated and the compounds are directed to the analytical column. The entire sequence of the MicroExtractor Concentrator is automated through the Timeline of the DPS Control Software.

**Plumbing Diagram** - We use a series of solenoids, instead of a sample valve to control the flow of carrier gas and the water sample flow through the MicroExtractor.

**Extraction** - The sample vial is pressurized and the water sample flows through the MicroExtractor and then out to waste.

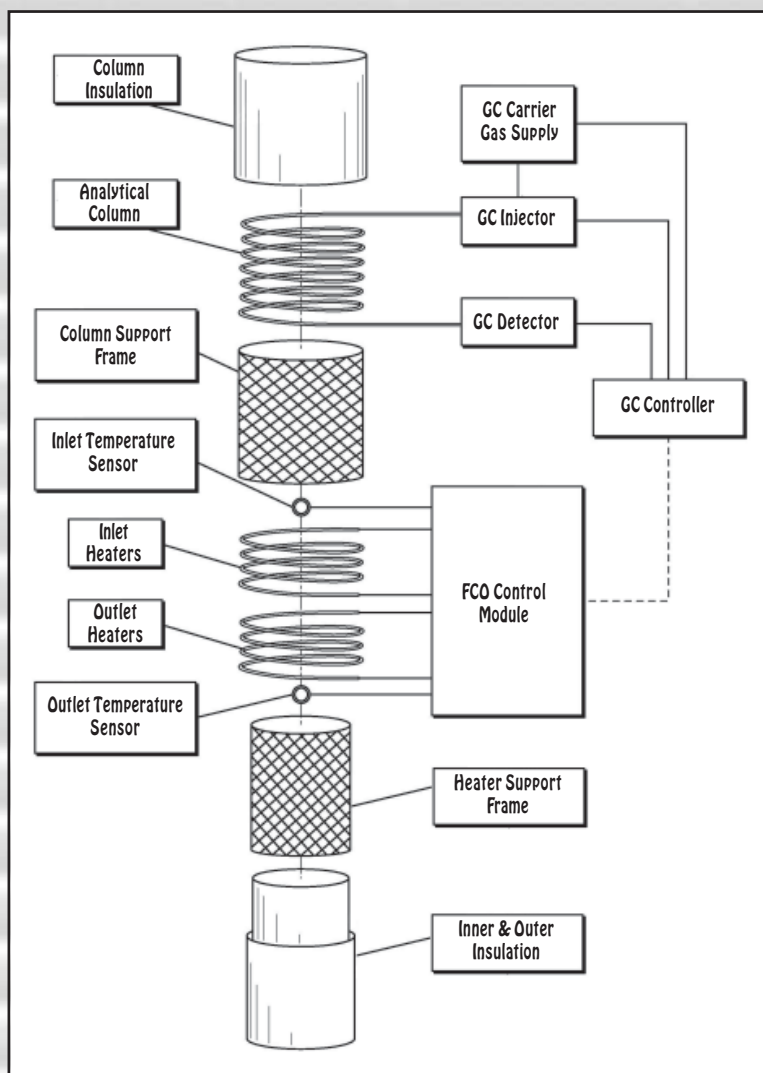
**Injection** - The carrier gas is directed through the MicroExtractor to sweep the compounds to the analytical column.



MicroExtractor Plumbing Diagram



## FCO Specifications:



### FCO's are Compatible With Standard Accessories:

- Air Concentrator
- Headspace Concentrator
- Purge & Trap Concentrator
- MicroExtractor Concentrator
- Methanizer
- Split/Splitless Injectors
- On-column Injectors
- Liquid Autosampler - 121 Vials, 2 mL
- Headspace Autosampler - 42 Vials, 10 or 20m L

### FCO Module and Controller:

- Inlet Heater Assembly
  - Gradient Heating to 450°C
  - Multiple Heating Coils
  - Temperature Set-Point to 0.1°C
- Outlet Heater Assembly
  - Gradient Heating from Ambient Temperature
  - Multiple Heating Coils
  - Temperature Set-Point to 0.1°C
- Analytical Column
  - Capillary - to 105m
  - Packed or Micropacked to 6m
  - No Glass Columns
- Control Board
  - 1 or 2 FCO's
  - High Temperature Switching Valve Control with Timer
  - Carrier Bypass Valve Control with Timer
  - Remote Start Input Signal
  - WLAN and Bluetooth
  - USB for External Computer
  - No Computer Required for Operation
- Control Software
  - Windows Application
  - Monitor and Input Temperatures
  - Monitor and Input Valve Timing
  - Methods Saved to Board

### Series 600 Options:

- Small Frame FCO's for Metal Capillary and Packed Columns
- Large Frame FCO's for Fused Silica Columns
- FCO plus Air Bath Oven

### Companion Options:

- Small Frame FCO's for Metal Capillary and Packed Columns



**Companion 1 GC**



**Companion 2 GC**



**Series 600 GC**



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