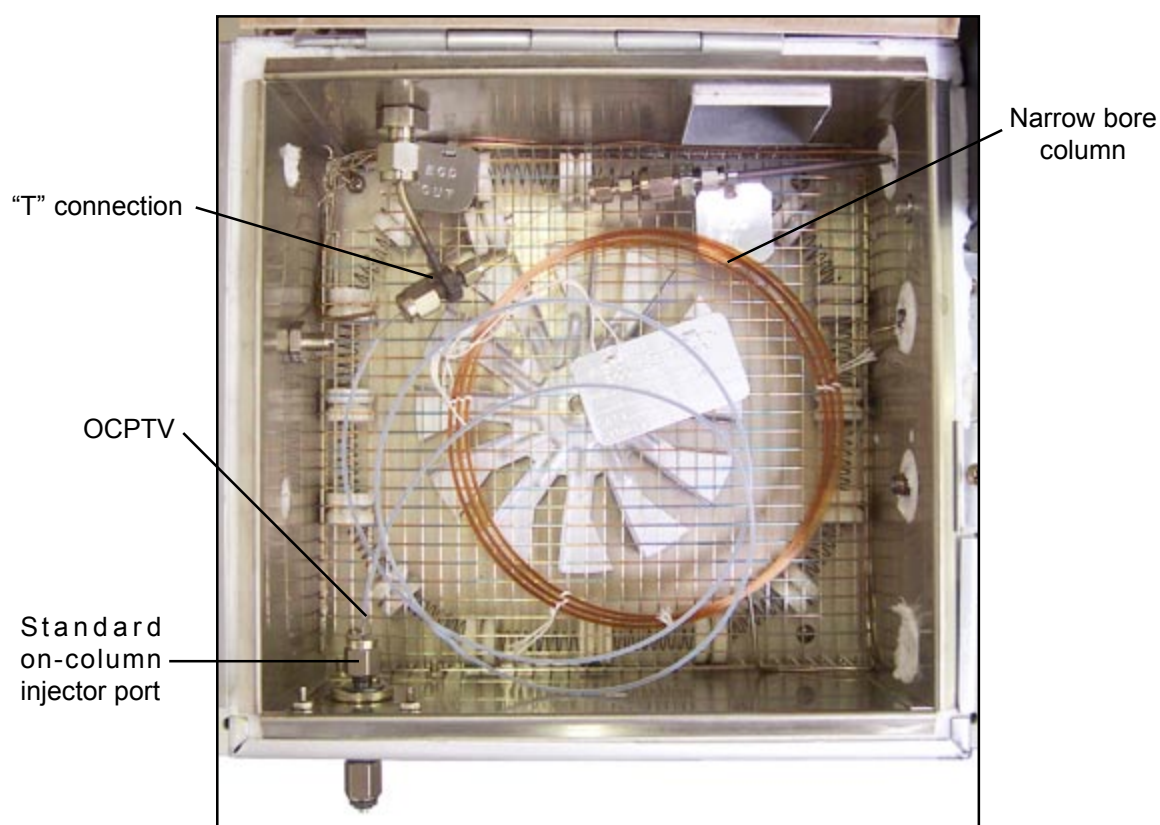


OCPTV - On-Column Programmed Temperature Vaporization Injector

Overview

The On-Column PTV is a resistively heated pre-column, consisting of a 1-meter long segment of 0.53ID metal capillary column (5 μ m film thickness), and insulating teflon sleeve. The pre-column is connected to the user's narrow bore column with a special, electrically insulated split "T" inside the GC column oven.



Like the Split/Splitless injector, the OCPTV has a split vent and needle valve for venting solvent while concentrating sample.

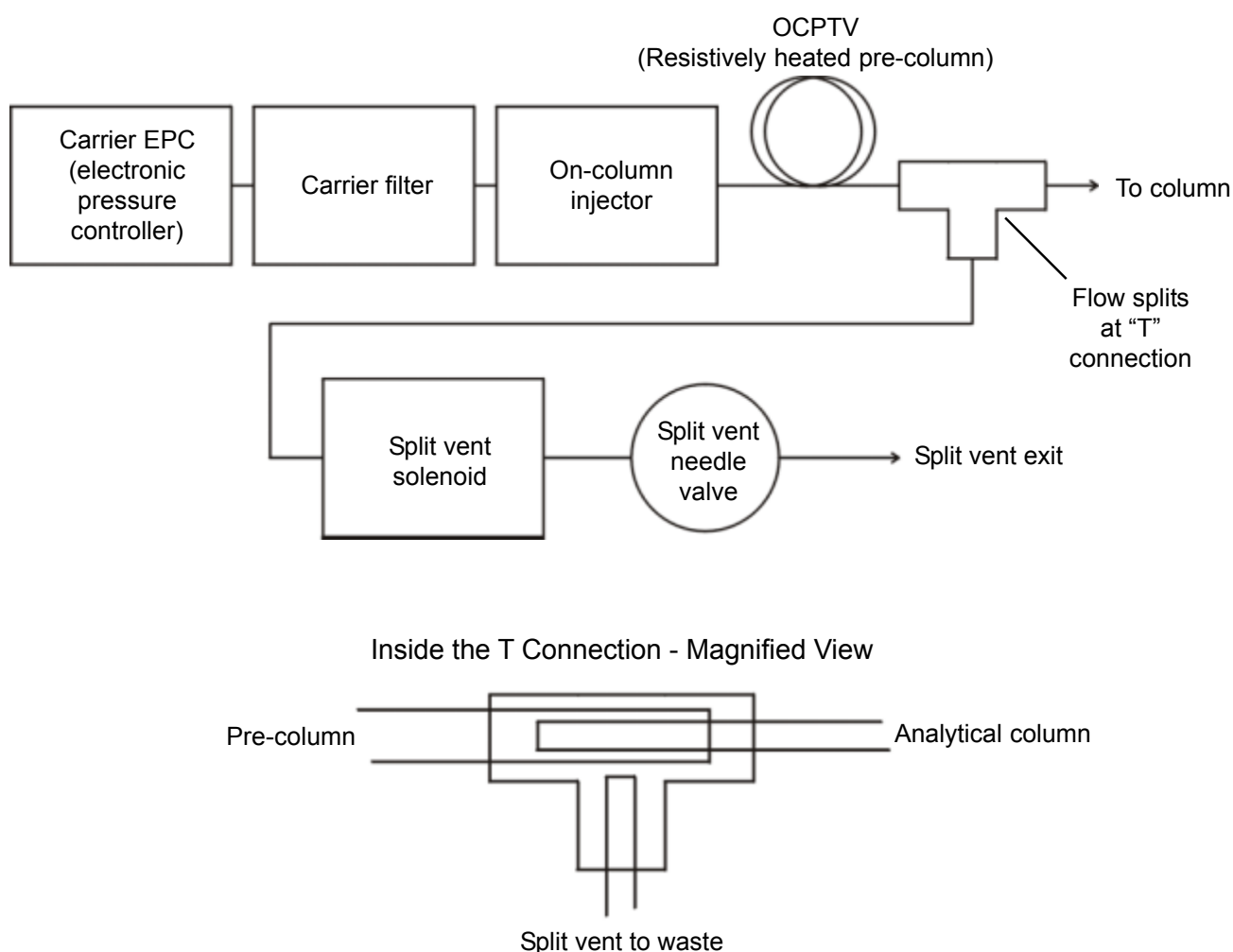
The pre-column will be factory installed. Should you need to disconnect it, simply loosen the injector port fitting inside the column oven and pull the pre-column out. Loosen the "T" fittings and remove both the pre-column and narrow bore column from the "T." Connect your replacement column to the injector port fitting inside the column oven.

INJECTORS

OCPTV - On-Column Programmed Temperature Vaporization Injector

Theory of Operation

The GC operator injects sample via syringe through the on-column injection port with the split vent open to vent the solvent. After injection and solvent venting, the pre-column heats up while the carrier gas flows through it to sweep focused analytes from the pre-column to the analytical column. At this point, the pre-column is hotter than the column oven. The temperature difference between the hotter pre-column and cooler analytical column causes the analytes to focus on the analytical column, resulting in sharp peaks on the chromatogram.



The 5 micron non-polar phase in the OCPTV pre-column has a high capacity to absorb high boiling compounds, and is stable at high temperatures. Like in-tube SPME, the pre-column discriminates in favor of high boiling semi-volatile analytes, concentrating them in the phase. Unlike a normal heated split/splitless injector, the OCPTV vents the solvent without expanding it to a gas. Therefore, the OCPTV can accommodate larger liquid injections than heated split/splitless injector.

INJECTORS

OCPTV - On-Column Programmed Temperature Vaporization Injector

Expected Performance

The following chromatogram from a GC equipped with an FID detector and OCPTV injector demonstrates the sharp peaks attainable from high boiling analytes with the OCPTV.

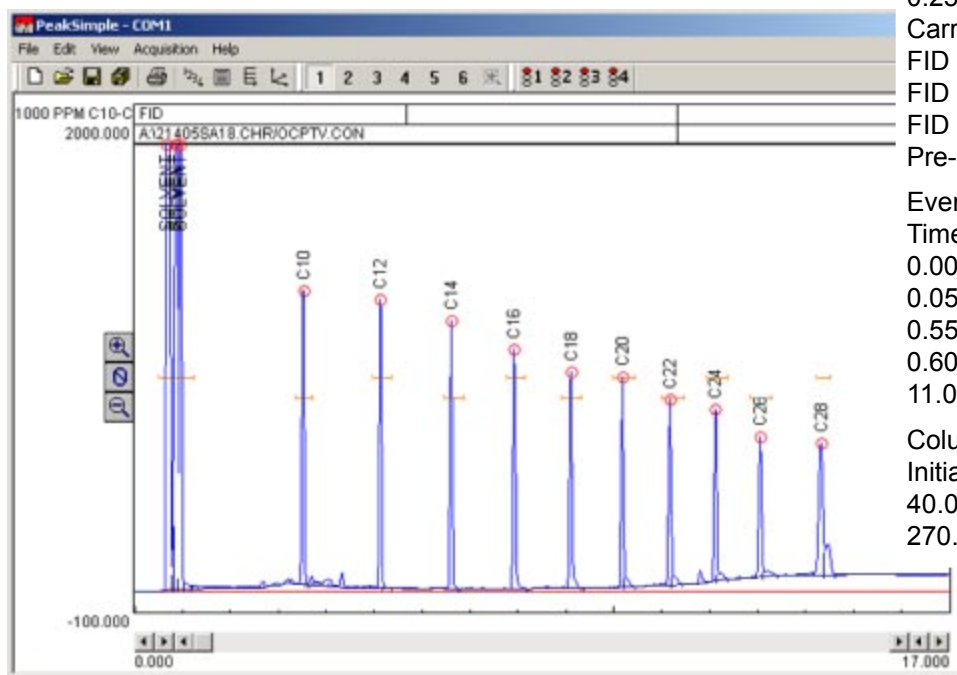
Sample: 2 μ L 100ppm diesel range organics in hexane
Column: 25-meter RXT-1 0.25mm 0.25 μ m
Carrier: hydrogen at 20psi
FID gain: HIGH
FID temperature: 300 $^{\circ}$ C
FID ignitor: -400
Pre-column vent flow: 100mLs/minute

Event Table:

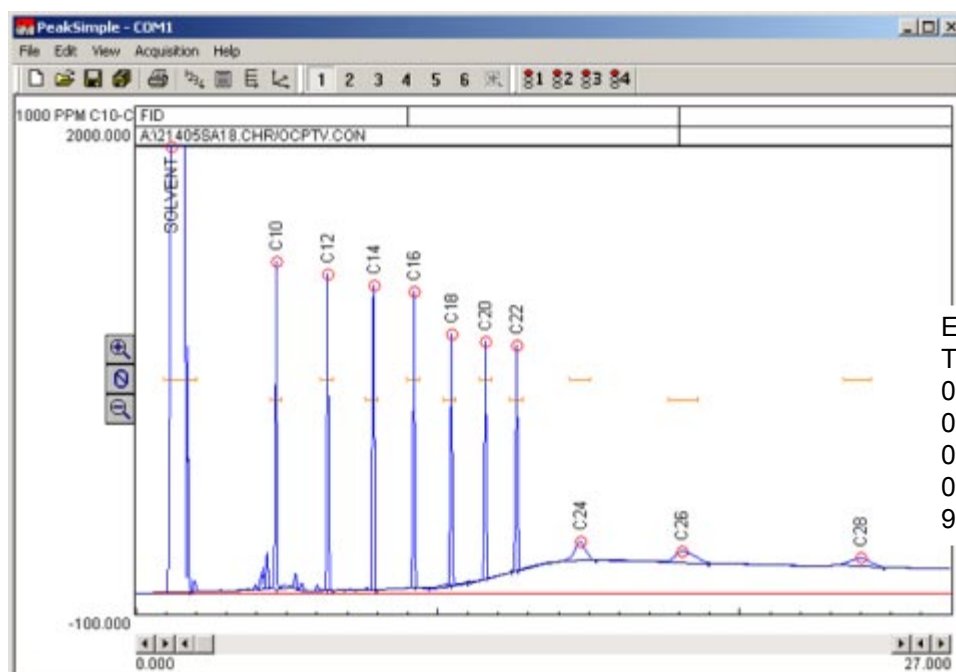
Time	Event
0.000	Zero signal
0.050	A ON (pre-column vent)
0.550	A OFF
0.600	F ON (pre-column heat)
11.000	F OFF

Column oven temperature program:

Initial	Hold	Ramp	Final
40.00	1.00	20.00	270.00
270.00	20.00	0.00	270.00



This chromatogram is from the same GC. It was made with the same analytical parameters, except a slightly different event table was used. In this event table, the pre-column heat was not kept on long enough to transfer the highest boiling analytes to the analytical column. The last three peaks are broad



because the column oven heat is what drove them from the OCPTV pre-column, rather than the OCPTV heat itself, as in the first chromatogram.

Event Table:

Time	Event
0.000	Zero signal
0.100	A ON (pre-column vent)
0.450	A OFF
0.500	F ON (pre-column heat)
9.000	F OFF

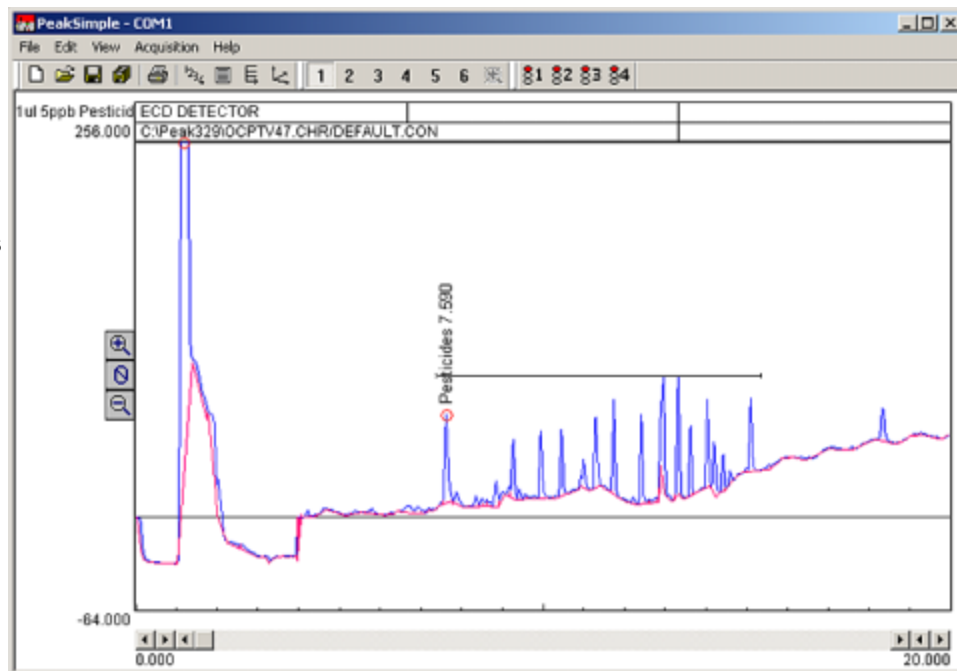
INJECTORS

OCPTV - On-Column Programmed Temperature Vaporization Injector

Expected Performance

The following chromatogram, from an SRI GC equipped with an OCPTV injector and an ECD detector, demonstrates the low detection levels achievable with the OCPTV. **NOTE:** Depending on the configuration, your GC may have different relay assignments than the examples used here.

Sample: 1µL 5ppb pesticides mix
Column: 15-meter XLB
0.25mm 0.25µm
Carrier: helium at 20psi
ECD temperature: 300°C
ECD current: 200



Event Table:

Time	Event
0.000	Zero signal
0.050	A ON (pre-column vent)
0.980	A OFF
1.000	B ON (pre-column heat)
11.000	B OFF

Column oven temperature program:

Initial	Hold	Ramp	Final
50.00	1.00	15.00	260.00
260.00	5.00	0.00	260.00

Results:

Component	Retention	Area
Pesticides	7.590	1864.6387