



Foods, Flavors, & Fragrances

Packaging Contaminants



www.dps-instruments.com

Alcohols, aldehydes, ketones, aromatics, and other hydrocarbons all play a role in the odor of packaged food and beverages. These odors coming from the food itself are highly desirable, whereas odors coming from the materials used to package the foods are always a problem. DPS Instruments has designed and developed a convenient way to determine the contribution from the packaging materials. The DPS Packaging Contaminants GC Analyzers use a built-in Dynamic Headspace Concentrator to fully automate the sampling and analysis of these materials, and a sensitive FID detector for low ppb level detection of Benzene, Toluene, Limonene and other hydrocarbons contaminants. The concentration of volatile compounds in everything from potato chip bags to PET pellets can be determined using one of the versatile DPS Packaging Contaminants GC Analyzers. The Series 600 GC is for analyses in the lab, or use the Portable Companion 2 GC Systems for analyses right where the samples are taken. The fully integrated Packaging Contaminants GC Analyzer Systems are small and lightweight and all DPS systems are modular for expandability, upgrades, and easy service.



Available Configurations Include:

600-C-056 - Series 600 Packaging Contaminants GC Analyzer (FID, 30m Column, Vial Heater, Dynamic Headspace Concentrator)

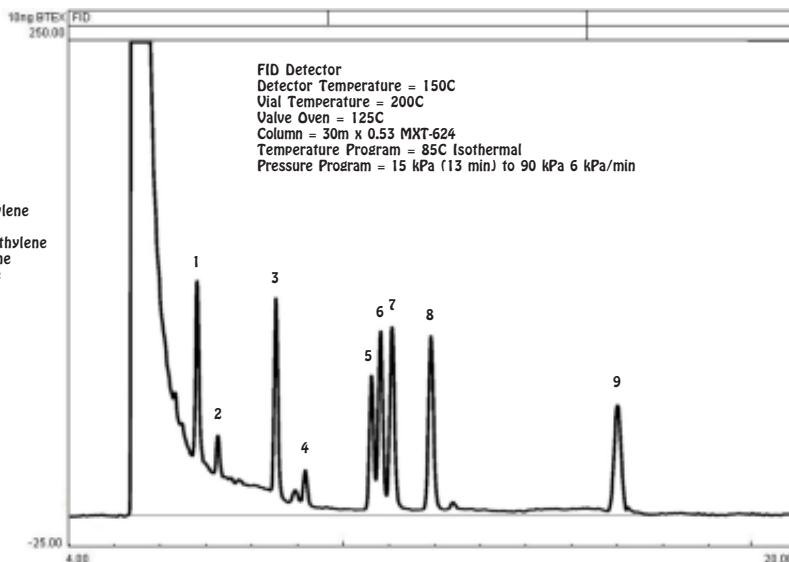
500-C2-056 - Companion 2 Portable Packaging Contaminants GC Analyzer (FID, 30m Column, Vial Heater, Dynamic Headspace Concentrator)

Series 600 GC



10 ppb BTEX & Limonene with Dynamic Headspace Concentrator

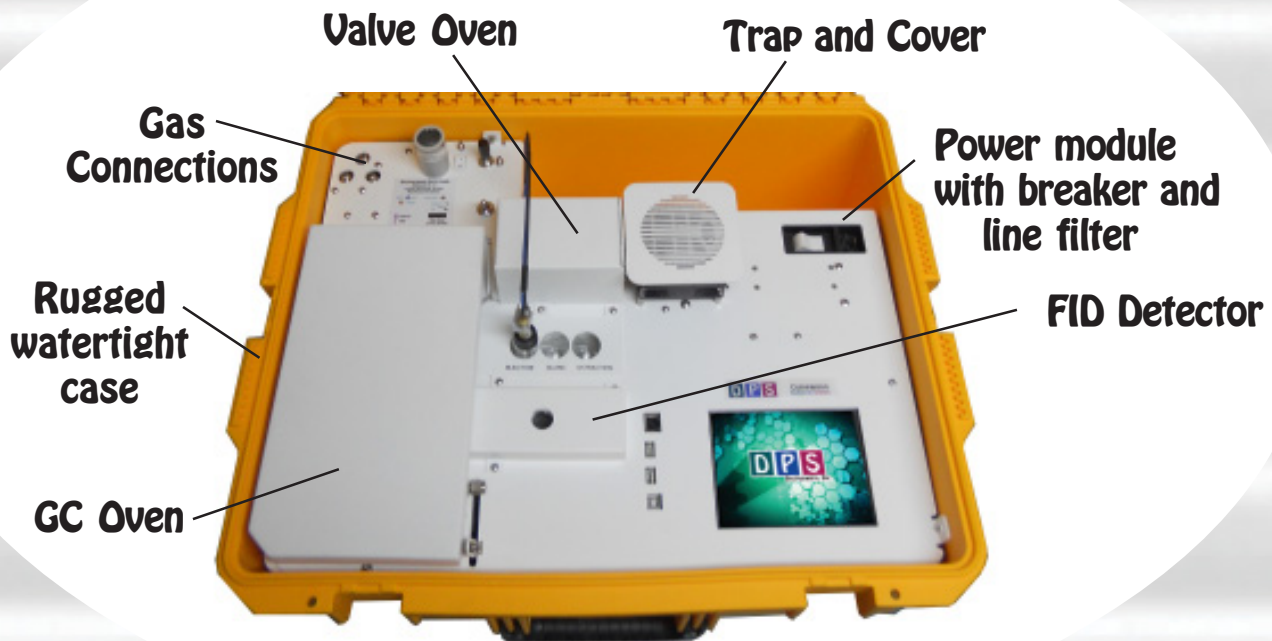
Peak	Component
1	Benzene
2	Trichloroethylene
3	Toluene
4	Tetrachloroethylene
5	Chlorobenzene
6	Ethylbenzene
7	m-Xylene
8	o-Xylene
9	Limonene



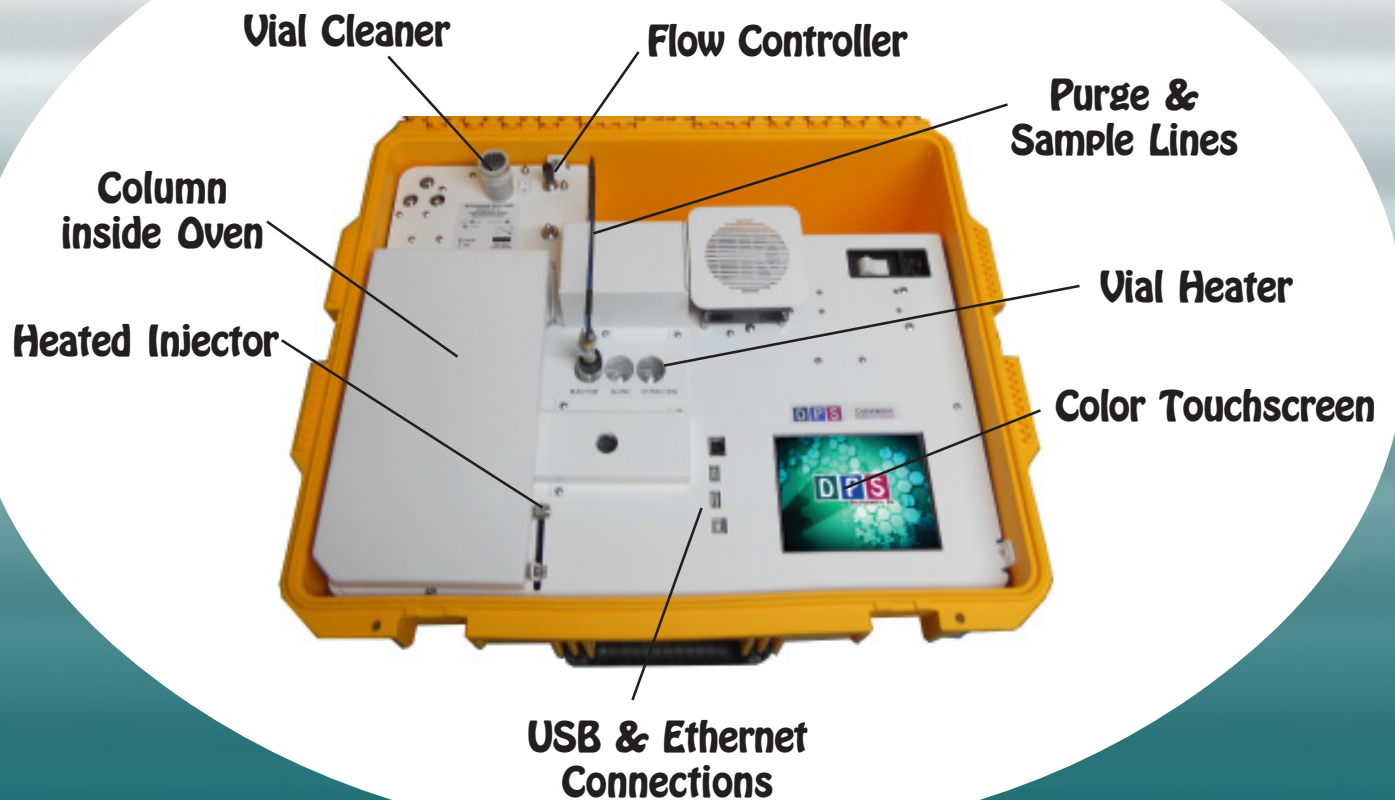
Companion 2 Portable GC
With Dynamic Headspace Concentrator,
(Vial Heater, "Cathedral" Trap, Sample Valve)

2/2021 (Specifications may change without notice.)

DPS Packaging Contaminants GC Layout



Companion 2 GC



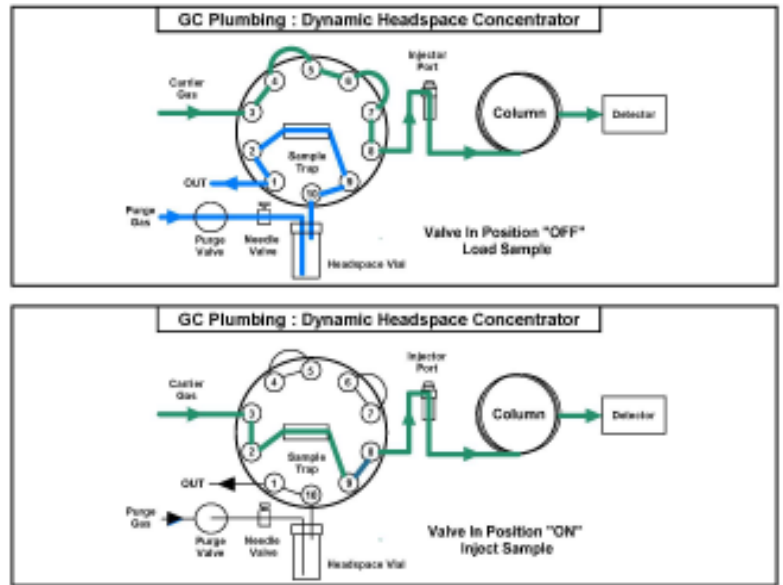
Plumbing Diagram

Dynamic Headspace Concentrator - The Dynamic Headspace Concentrator is built right in with multi-position Vial Heater, "Cathedral" Trap and Heater, 10-port Electronically actuated Valve in a Heated Valve Oven. The Headspace Vial is purged with inert gas to load the sample compounds onto the Trap. The Purge Gas is regulated with a variable flow controller for consistent sample trapping. The Automated Vial Purge, Trap, Pre-heat, Desorb, and Bake sequences of the Dynamic Headspace Concentrator are controlled 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 Headspace Vial transferring the sample to the "Cathedral" Trap for concentration.

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

Bake - Using a clean Vial the Purge Valve can be turned ON to Bake out the Trap between analyses.



Built-in Dynamic Headspace Concentrator Plumbing Diagram

Results, Data & Connectivity

Results: In this unique plumbing configuration the sample is placed inside a heated vial. The sample can be water, pellets, packaging material, or a PET Blank. You get the same peak areas on the chromatogram no matter which source the sample comes from. For example, the results presented on the first page are from a BTEX standard spiked into clean water. The same results would be obtained if BTEX was spiked onto pellets, because in either case 10 nanograms of each component are loaded on the Trap and the detector responds with the same value.

Data and Connectivity: The built-in computer is used to collect and store the data. Data can also be copied to a USB Stick to transfer to another computer. Data can be transferred from the built-in computer to another computer on the LAN through the Ethernet port using standard Windows protocols. Or, we can use a USB cable to connect the GC to the remote computer where the data can be collected and stored on that hard drive.

GC Control Software

Easy to learn and master using a Graphical User Interface (GUI) and Color Touch Screen.

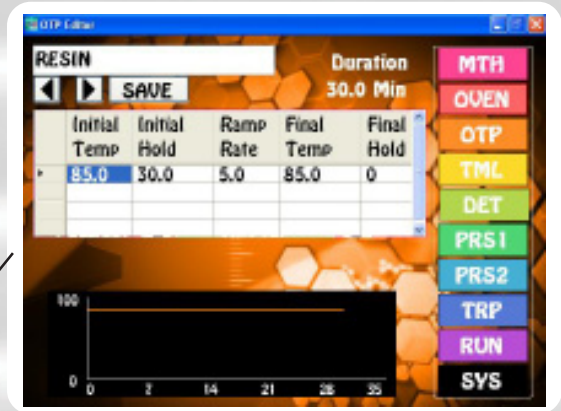
Editors let you customize the files associated with the GC Method.

Method Name



File Selection Arrows

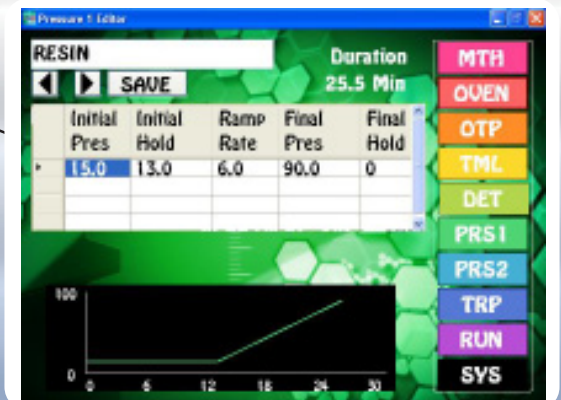
Navigation Buttons to Quickly jump from one screen to another. Most pages are one button away!



Oven Temp Program Editor



Timeline Editor



Carrier Pressure 1 Editor



Keyboard to Enter Filenames



Number Pad for entering Values

GC Status pages display the parameters in the method, both graphically and as text and values.

	Actual	Target	Set Point	MTH
Oven Temp (°C)	85.1	85.0	85	OVEN
Ini1 Temp. (°C)	200.0	200.0	200.0	OTP
Ini2 Temp. (°C)	25.0	275.0	275.0	TML
VALVE (C)	125.1	125.0	125.0	DET
Carrier1 (kPa)	15.1	15.0	15	PRS1
Carrier2 (kPa)	0.1	0.0	0	PRS2
				TRP
				RUN
				SYS

Oven Status

Method Editor

RESIN Duration 30.0 Min

SAVE

OTP RESIN

Timeline RESIN

Detector RESIN

Carrier1 RESIN

Carrier2

Trap

MTH

OVEN

OTP

TML

DET

PRS1

PRS2

TRP

RUN

SYS

Method Editor

Detector Status

RESIN

SAVE

AD

Detector On

Zero 0-5V

	Actual	Set Pt	MTH
DET (C)	150.0	150.0	OVEN
EPC1 (kPa)	51.9	50.0	OTP
EPC2 (kPa)	35.6	35.0	TML
			DET
			PRS1
			PRS2
			TRP
			RUN
			SYS

0.016 127 Signal (V)

GAIN

IGNITOR 2.0

COLLECTOR 100.0

Detector Status

System Status

System Settings

Hardware

Diagnostics

View Timeline

Configure Names

Remote

Connect

VER 1.4.46.32

MTH

OVEN

OTP

TML

DET

PRS1

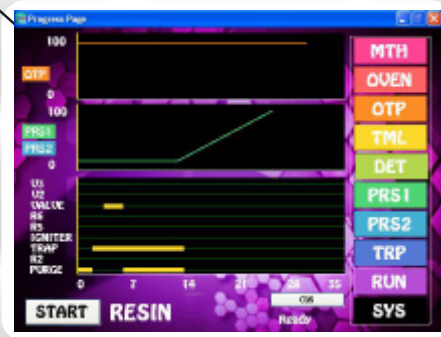
PRS2

TRP

RUN

SYS

System Status



Run Status

System status pages display the health and viability of the GC instrument.

Hardware

SLOT	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
TYPE	GC	OVEN								DET1
ORG										FID
HW	3	3								3
SW	2.51	2.52								2.53

Current Versions - GC - 2.51 UDS - 2.50
OVEN - 2.50 TCD - 2.55

Enumerate

Hardware

Configure Names

RELAY1	PURGE	VALUE1	UNLVE
RELAY2	R2	VALUE2	U2
RELAYS3	TRAP	VALUES3	U3
RELAY4	IGNITER	EPC1	EPC1
RELAYS5	R5	EPC2	EPC2
RELAYS6	R6		

VACUUM UNCUIN

EXTRACTOR EXTRACTOR

ACTUATOR ACTUATOR Default

Configure Names

Diagnostics

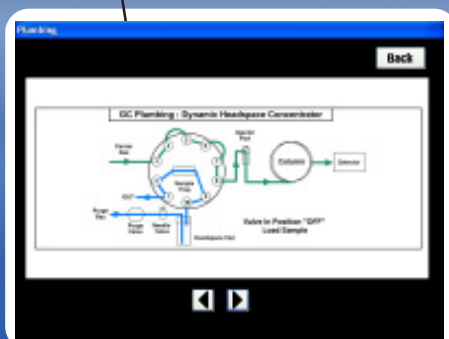
RELAYS	PURGE	R2	TRAP
	IGNITER	R5	R6
VALUES	VALUE	U2	U3
EPCS	EPC1	EPC2	
EXTERNALS	VACUUM	EXTRACTOR	ACTUATOR

FAST

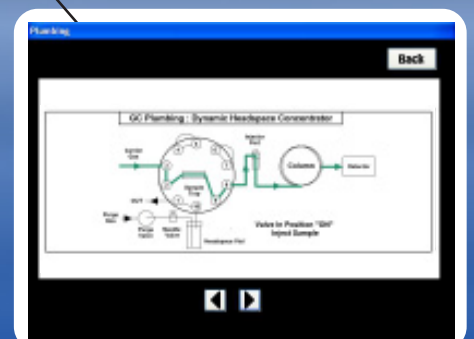
SLOW

Circle Selected Circle All Reset All

Diagnostics



Plumbing Load and Inject



Packaging Contaminants GC Specifications:

Electronics Module:

- Enter and store GC Methods via Color Touch Screen
- Actual and set-point display of all GC parameters
- Safety Limits on all user entered parameters
- Oven Temperature Programs (OTP) with Multiple Ramps
- Pressure Programs for Carrier Gases with Multiple Ramps
- Timeline for sequencing Relays and Valve
- Detector Control of all Parameters on one page
- Electronic Pressure Controllers (EPC's):
 - Atmospheric Pressure & Temperature Compensation
 - EPC Pressure Control with 0.1 kPa set-point resolution
- Plug and Play GC Control, Oven, and Detector Board
- Microprocessor Controlled
- Proprietary Digital Signal Processing
- Digital Signal Outputs for each Detector
- Universal voltage input (85 – 240 Vac) with line filter and breaker.

Detectors:

FID – Flame Ionization Detector

- 400 °C Temperature Limit with 0.1 °C set-point resolution
- 24-bit Digital Outputs for the detector via USB
- EPC Pressure Control with 0.1 kPa set-point resolution

Columns:

15m, 30m, or 60m Capillary Columns

Results:

Automatically calibration corrected and reported

Series 600 Oven Module:

- Ambient to 400°C Column Oven
- Up to 100 °C per/min Oven Ramp
- Fast Cooldown 300 °C to 50 °C in 3.5 min
- 1000 watt total Heater Elements
- Temperature Ramps with 0.1 °C set-point resolution
- 23 x 23 x 20 cm area for Glass, SS, or Capillary Columns

Companion 2 Oven Module:

- Ambient to 325 °C Column Oven
- Up to 80 °C per/min Oven Ramp
- Fast Cooldown 300 °C to 50 °C < 4 min
- 200 watt Heater Element
- Temperature Ramps with 0.1 °C set-point resolution
- 12.5 x 10.5 x 12.5 cm area for Packed, or Capillary Columns
- 12 amps at 48 Vdc total power consumption

Built-In Accessories:

- Dynamic Headspace Sample Concentrator
- Vial Heater - 3-Position
- Headspace Vial Cleaner

Injectors:

- Heated On-column Injector
- Split/Splitless Injector
- Multiple Pressure Ramps with 0.1 kPa set-point resolution

Data Communications:

- Bi-directional communication with popular Data System

Network Connectivity:

- Enterprise Compatible Network GC running Windows XPe
- Ethernet Connection using Windows Network Protocol
- On Board ETX Computer for GC Control and Data Acquisition
- Remote Control of GC and Data Acquisition over LAN



*Lab Quality Analyses in the Field,
"It Goes with you Anywhere!"*