



The DPS Perma-gas 1 Plus Sulfur GC System is ideal for separating the whole gas components Hydrogen, Oxygen, Nitrogen, Methane, Carbon Monoxide and Carbon Dioxide with one injection. Additionally, H₂S and C₂ through C₆ hydrocarbons are easily separated in the same analysis. The sensitive and universal Helium Ionization Detector (HID) from DPS and our innovative 2 column and valve configuration simplifies this analysis. The DPS Perma-gas 1 + Sulfur GC Systems are ideal for ppm level measurements in your high percentage gas samples. Perma-gas 1 + Sulfur GC Systems can be built into our Series 600 Lab GC, or the Portable Companion 2, allowing you to take the analyzer with you into the field. Only a small tank of Helium is need to operate the GC System. The fast heating and rapid cooling column oven in every DPS GC assures rapid sample turnaround. The fully integrated Perma-gas 1 + Sulfur GC Analyzer Systems are small and lightweight and all DPS systems are modular for expandability, upgrades, and easy service.



Series 600 GC

Available Configurations Include:

600-C-073 - Series 600 Perma-Gas 1 + Sulfur GC Analyzer (HID, PID, Valve, 3 Columns)

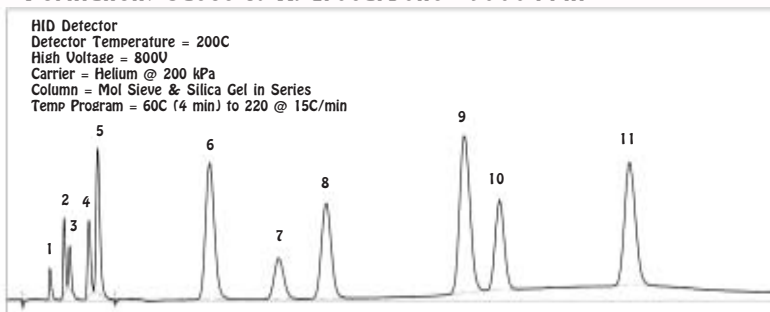
500-C2-073 - Companion 2 Portable Perma-Gas 1 + Sulfur GC Analyzer (HID, PID, Valve, 3 Columns)



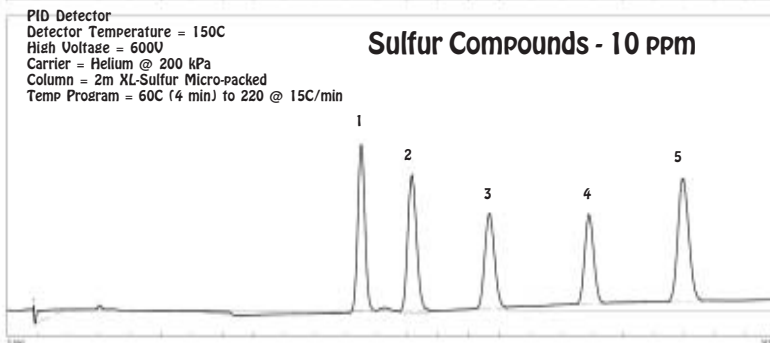
Companion 2 Portable GC

Permanent Gases & Hydrocarbons - 1000 ppm

Peak	Component
1	Hydrogen
2	Oxygen
3	Nitrogen
4	Methane
5	Carbon Monoxide
6	Ethane
7	Carbon Dioxide
8	Ethylene
9	Propane
10	Acetylene
11	Propylene



Peak	Component
1	Hydrogen Sulfide
2	Carbonyl Sulfide
3	Methyl Mercaptan
4	Dimethyl Sulfide
5	Dimethyl Disulfide



DPS Companion 2 Perma-Gas + Sulfur GC Layout

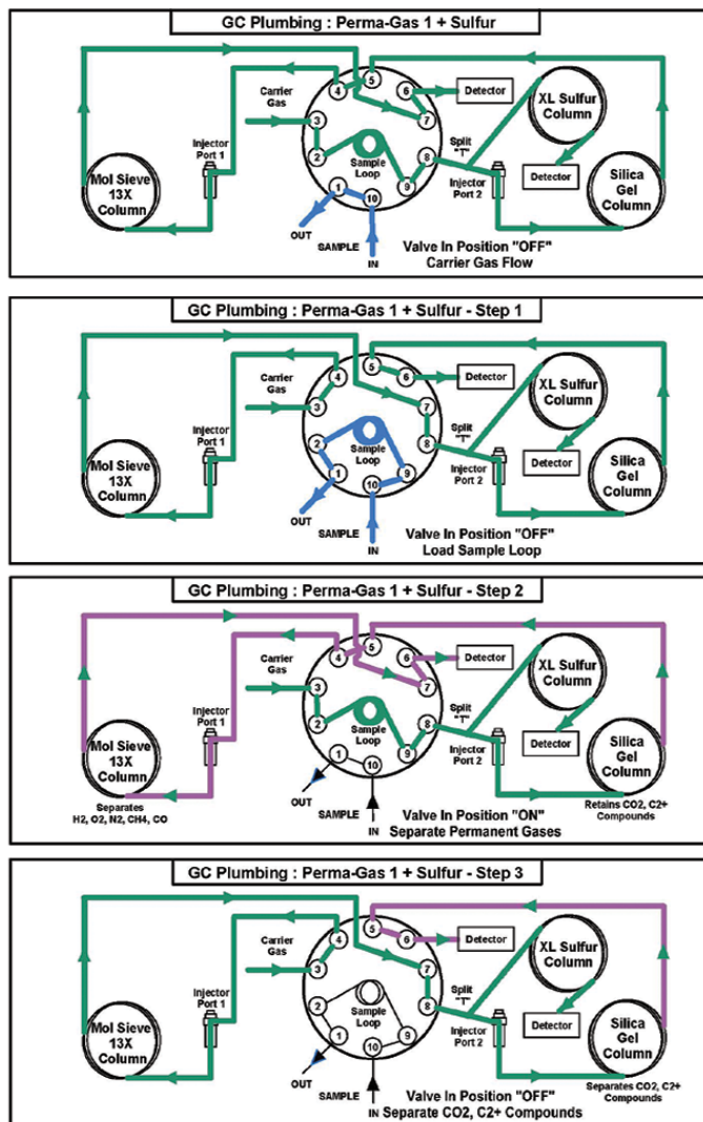


Plumbing Diagram

Sample Analysis - The Gas Sample Valve and heated Valve Oven for the Companion GC's are built right in to provide the shortest possible sample path. The Sample Line is connected to the Valve Oven and from there all of the entire sample path is heated to limit possible carry over. A fixed Sample Loop ensures reproducible sampling and is Flushed between analyses. The sampling and analysis sequence is automated through the Timeline of the DPS GC Control Software. The analysis can be set up to run unattended 24/7 collecting, processing, and storing all of the data.

The unique 2 column configuration simplifies the compound separation and analysis. The columns are plumbed in series through the heated Sample Valve.

Plumbing Diagram - In the 1st Step the sample is loaded on the Sample Loop with the built-in vacuum pump. During Step 2 the Sample Valve is rotated to Inject the sample simultaneously onto the Silica Gel and XL-Sulfur analytical columns. The XL-Sulfur separates the Sulfur compounds, which are detected by the PID detector down into the ppb range. The Silica Gel column retains CO₂ & the C₂+ hydrocarbons, while the lighter compounds (H₂, O₂, N₂, CH₄, & CO) pass through and are further separated on the Molecular Sieve column. Once the lighter compounds have been separated the valve is rotated back in Step 3 and the heavier compounds (CO₂ & C₂+ hydrocarbons) are separated on the Silica Gel column.



Perma-Gas + Sulfur Plumbing Diagram

Results, Data & Connectivity

Results: The results and chromatogram are stored on the hard drive. Additionally, for each channel a log file summary of the compounds detected is a convenient way of looking at large amounts of data collected over time.

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.



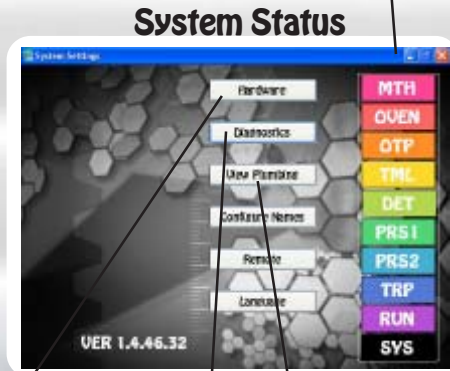
Oven Status



Method Editor



PID Detector Status

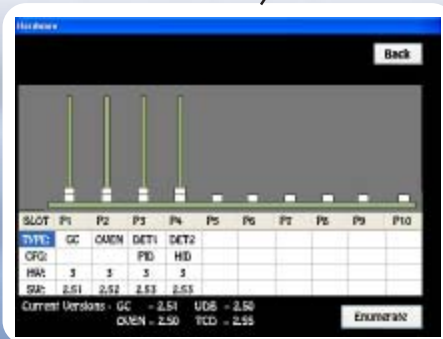


System Status



HID Detector Status

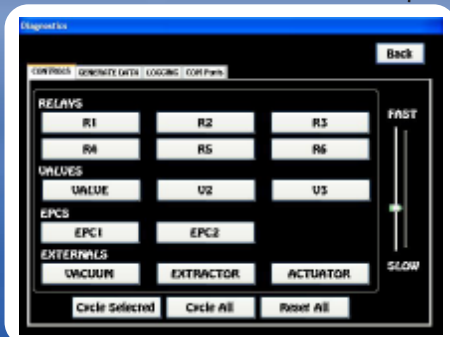
System status pages display the health and viability of the GC instrument.



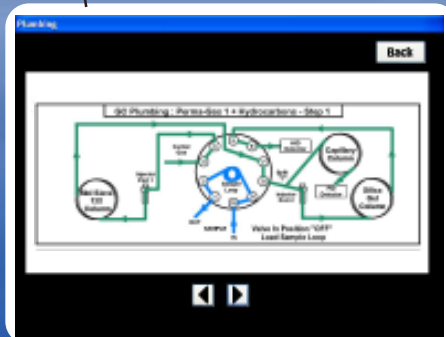
Hardware



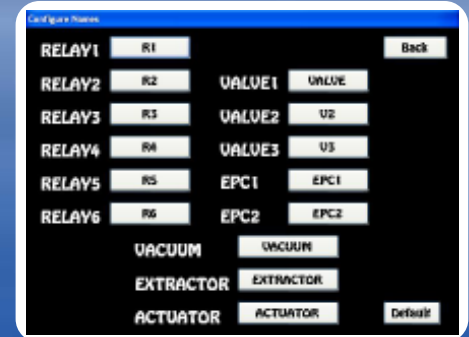
Run Status



Diagnostics



Plumbing



Configure Names

Perma-Gas + Sulfur 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.

Detector:

HID – Helium Ionization Detector (10 ppm detection limit)
 PID – Photoionization Detector (100ppb detection limit)
 (dependent on sample loop size)

- 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:

1m Molecular Sieve, 2m Silica Gel, 2m Micro-packed

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
- 7 amps at 48 Vdc total power consumption

Built-In Accessories:

- Sample Valve - Electronically Actuated
- Heated Valve Oven
- Vacuum Pump
- Calibration Gas & Stream Selection Solenoid

Injector:

- Heated On-column Injectors
- 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!"*