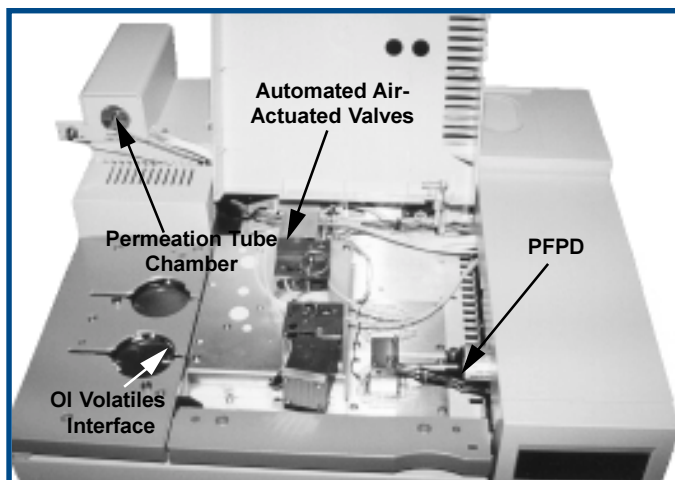


S-PRO 3200 Series GC Systems for Sulfur Analysis



The OI Analytical S-PRO 3200 System is a complete GC system that incorporates calibration/QC capability, automated sample introduction, and compound quantitation on a fully integrated Agilent 6890 platform. The system consists of an Agilent 6890 GC with a built-in Permeation Tube Oven with Aux EPC flow control of the dilution gas for the permeation system.

Principle of Operation:

The sample is introduced by an air-actuated gas sampling valve (gas or LPG type) and a sample selection switching valve that is programmed to select either the user's sample to be analyzed or the calibration sample from the permeation system. The sample from the valve is injected into the column through a split/splitless OI Volatiles Interface optimized for inertness and low dead volume injection. The entire sample pathway is Sulfinert coated and can accommodate gas-sampling loops (25–500 mL) or liquid sample loops. An Agilent GS-GasPro® column is used to

S-PRO 3200 Series GC System

- Completely automated sample injection (gas or LPG), calibration, and QA/QC.
- Integrated Permeation Tube Oven with EPC flow control requires no benchspace and provides single or multiple calibration (or QC) standards.
- Automated injection of calibration or QA/QC check samples provided by the built-in valving and permeation system eliminates the need for unstable, expensive sulfur gas standards.
- OI Volatiles Interface, optimized for valve injection, provides low dead volume split or splitless injection, providing a wide dynamic range for the system.
- Entire sample pathway is Sulfinert™-treated to minimize absorptive surfaces for optimal performance, particularly for low sulfur concentrations.
- Proven PFPD detector provides stability, sensitivity, selectivity, and equimolar sulfur response; calibrations in linear and/or quadratic modes; and multi-element detection capability.
- Single digit ppb sensitivity for sulfur analysis.
- Full EPC control of all injector, permeation oven, and detector gases.
- Using additional or alternative detectors (PID, ELCD, XSD, or tandem configurations) allows the analysis of other compounds of interest.

chromatographically separate the individual volatile sulfur compounds for detection and quantitation on the OI Analytical Model 5380 PFPD. The low-maintenance PFPD employs an OIM EPC flow module to control all gases to the detector, and has the capacity to output signals to two analog input boards simultaneously.

Principal Applications:

- Sulfur in CO₂ (beverage grade)
- Sulfur in petrochemical process streams
- Semiconductor gas purity
- Gas blending and manufacturing
- Calibration gas analysis
- Odor Analysis

Product Specifications

General Specifications

Detectivity

- Sulfur: < 1 pg S/sec

Sensitivity

- Sulfur signal-to-noise ratio at 10 pgS/
sec elution rate: S/N > 300 (peak-to-
peak noise)

Selectivity

(at Optimum Detectivity Levels)

- Sulfur: >10⁶ S/C

(Selectivity is adjustable with a tradeoff in detectivity.)

Detector Linearity

- Sulfur: Quadratic in response. Linear over 2.5 orders of concentration, which gives 5 orders signal response.

Response Uniformity

- Equimolar ±8% (S, P)

Chromatographic Peak Tailing

- < 0.2 sec in S and P

5380 Controller Dimensions

- 8.75" H x 6" W x 13" D
- 22.2 cm H x 14 cm W x 33 cm D

Pneumatics

- Optional Manual control with pressure regulators, mass flow controllers, and fine metering needle valves
- Electronic Pneumatic Control

Drift

- Sulfur or Phosphorus: <10X peak to peak noise in 20 minutes

OI Volatiles Interface

- EPC flow controlled split or splitless capabilities
- Effective split range: 0–150 to 1 (actual range dependent on loop size)
- Temperature range: 0°–325°C
- Sulfinert treated

Permeation Tube Oven

- 2.7" W x 6.6" D x 2.6" H
(7.0 cm W x 16.7 cm D x 6.7 cm H)
- Temperature range: 30°–75°C ±0.05°C
(minimum setpoint is 2°C above ambient)
- Internal volume: 3.2 in³, 52.8 mL
- Dilution gas EPC flow controlled, 10–100 mL per minute
- Sulfinert treated

Sampling and Valve System

- 4-port switching valve
- Choice of 6-port gas sampling valve (100-µL Sulfinert-treated loop standard) or a 4-port liquid (LPG) sample valve (2-µL loop standard)
- Valves are air actuated (manual or electronic actuation is optional)
- Valves installed in GC's heated valve oven
- Alternative gas sample loop sizes available: 50 µL, 200 µL, and 500 µL
- Sample line connection: 1/8" Valco compression fitting
- Vent lines: 1/16" stainless tubing, Swagelok® union

Performance Specifications

Temperature Limitations

- Minimum: 180°C
- Maximum: 420°C

Carrier Gas

- Maximum flow rate (He, N₂): 5 mL/min
- Higher rates (up to 15 mL/min) by using H₂ carrier gas

Typical Gas Consumption

- H₂: 11 mL/min
- Air: 25 mL/min

Environmental Considerations

Humidity

- 5% to 80% relative humidity

Temperature

- +10° to +40°C (operating)
- –20° to +65°C (nonoperating)

Altitude

- Maximum 2,000 m

Requirements

Gas Requirements

- Carrier: helium, nitrogen, or hydrogen, 80 psig; 99.98% purity or better
- Air: 60 psig; Zero Air (CGA Grade E)
- Hydrogen: 60 psig; 99.995% or better (Electrolytic Grade)

Power Requirements

- 115 (±10%) VAC, 50/60 Hz
- 230 (±10%) VAC, 50/60 Hz

Host Hardware Requirements

- CPU: Intel Pentium 90 MHz or higher
- Video: Color VGA or higher
- Ports: 1 Serial Port (RS-232-C), 16550 UART highly recommended

Host Software Requirements

- Windows Version 3.1x or Windows 95

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