

4430 PID

PHOTOIONIZATION GC DETECTOR

The 4430 Photoionization Detector (PID) is a GC detector that selectively responds to aromatic and olefinic hydrocarbons in the presence of alkanes and other saturated hydrocarbons. The 4430 detector contains an ionizing chamber, UV lamp, and column makeup adaptor and uses a standalone, high-voltage power supply for the UV lamp.

The 4430 PID features a unique patented Window Sweep™ design that prevents the sample stream from contacting and contaminating the lamp window. It also allows analysis of photosensitive compounds, which would otherwise polymerize on the window surface. The 4430 PID is available for installation on most GC manufacturer's instruments.



Operating Principle

The sample stream flows through the detector's reaction chamber where it is continuously irradiated with high-energy ultraviolet light. Compounds that have an ionization potential lower than the irradiation energy (10.2 electron volts with standard lamp), are ionized. The ions formed are collected in an electrical field, producing an ion current that is proportional to compound concentration. The ion current is amplified and output by the gas chromatograph's electrometer.

PID Capabilities

- Unique UV-lamp Window Sweep design minimizes fouling of window surface
- Lampsaver™ circuit extends lamp lifetime by turning off lamp when not in use
- Directly interfaces to an ELCD, XSD™, or FID to form a tandem detector which requires only one detector port
- Detector vent for venting undesirable sample solvents
- Compatible with packed and capillary columns
- Engineered to fit specific gas chromatograph models
- Easy operation and maintenance

Principal Applications

- USEPA Methods (502.2, 503.1, 602, 8020, 8021)
- BTEX, GRO, DRO and VPH
- Aromatics
- Olefins
- Alkenes and alkynes
- Underground storage tank monitoring
- Waste characterization
- Air pollution/industrial hygiene

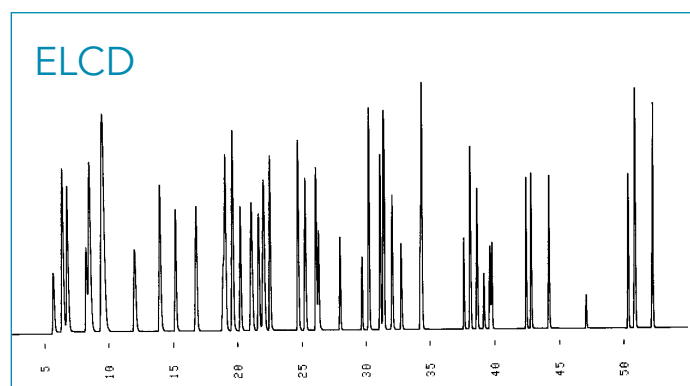
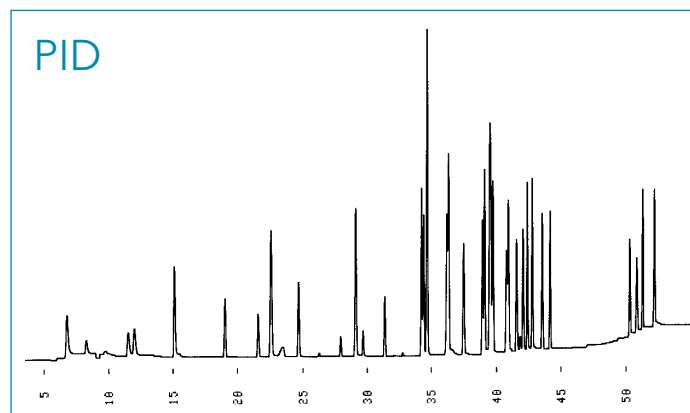
4430 PID SPECIFICATIONS

Weight	3 kg (5.5 lb)
Controller Dimensions	14.5 cm H x 6.9 cm W x 23 cm D (5.75" H x 2.75" W x 9" D)
Maximum Operating Temperature	250 °C
Materials of Construction	
Inlet	Glass-lined stainless steel
Ion Chamber	Gold-plated stainless steel
Solvent Vent Valve	Remotely controlled through GC external event
Patent	The 4430 PID is protected under U.S. Patent number 4,804,846.
Dynamic Range	>10 ⁶
Linear Range	>10 ⁶
Sensitivity	<40 pg Benzene
Lamp Current	0-1.60 mA (in 9 steps)
Lampsaver Time	0.5-2 hr, reset by external contact
Gas Requirements	He (99.999% purity)
Power Requirements	105-125 (±10%) V _{AC} /25 VA 210-240 (±10%) V _{AC} /25 VA

Note

Performance is affected by several factors, including GC, column, gas flows, and compound class.

PID and ELCD chromatograms of USEPA Method 502.2 standard, 5 ppb of each component



Standard

5 ppb each in 5 mL H₂O

Gases

10 mL/min (He) Carrier
20 mL/min (He) Makeup

Oven

35 °C for 10 min, to 200 °C at 4 °C/min, hold at 200 °C for 10 min

P&T Sample Concentrator

Standard EPA Method 502.2, Tenax®/Silica/Charcoal Trap (#9 Trap)

Column

Rtx® - 502.2, 105 m x 0.53 mm I.D. x 3.0-µm film thickness



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