

# 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

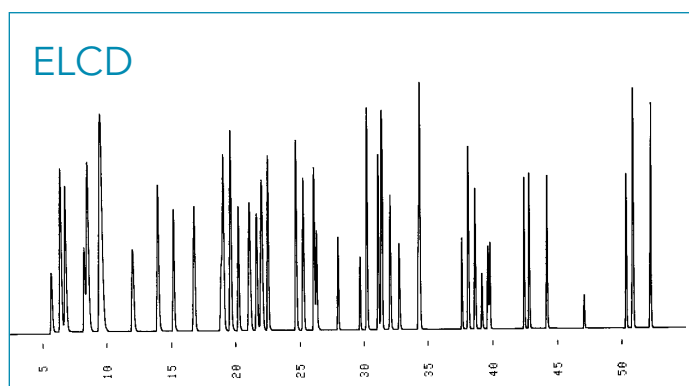
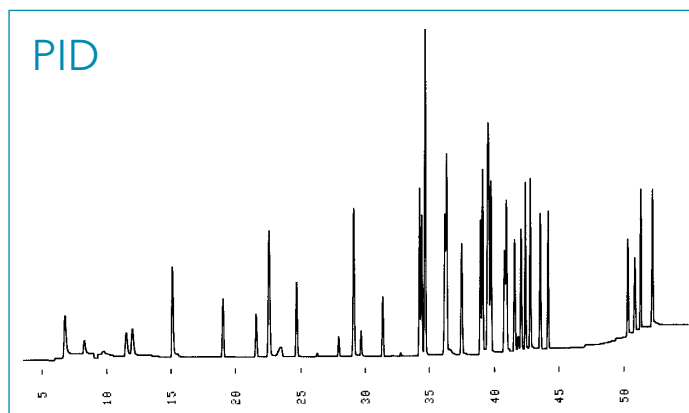
# 4430 PID SPECIFICATIONS

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

### 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



151 Graham Road  
PO Box 9010  
College Station, Texas  
77842-9010

(979) 690-1711  
(800) 653-1711 USA/Canada  
FAX (979) 690-0440

www.oico.com  
E-mail: OI-Mail@Xyleminc.com

Publication 02430713

Lampsaver, Window Sweep, and XSD are trademarks of OI Analytical.

Rtx is registered trademark of Restek Corporation.

Tenax is a registered trademark of Enka Research Institute Arnhem.