



## Model 4430 PID Photoionization Detector

### Description

The Model 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 detector assembly contains an ionizing chamber, UV lamp, and column makeup adapter 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 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. When compounds are present that have an ionization potential lower than that of the irradiation energy (10.2 electron volts with standard lamp), they 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 from window surface contamination
- Lampsaver™ circuit extends lamp lifetime by turning off lamp when not in use
- Direct interface to ELCD, XSD™, or FID to form tandem detector systems, which require only one detector port
- Detector vent for venting undesirable sample solvents
- Compatible with packed and capillary columns
- Custom 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
- Drinking water/groundwater
- Underground storage tank monitoring
- Waste characterization
- Environmental
- Air pollution/industrial hygiene

## Performance Specifications

<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

## Requirements

<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.

## General 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 OI Analytical Model 4430 PID is protected under U.S. Patent number 4,804,846.

### 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

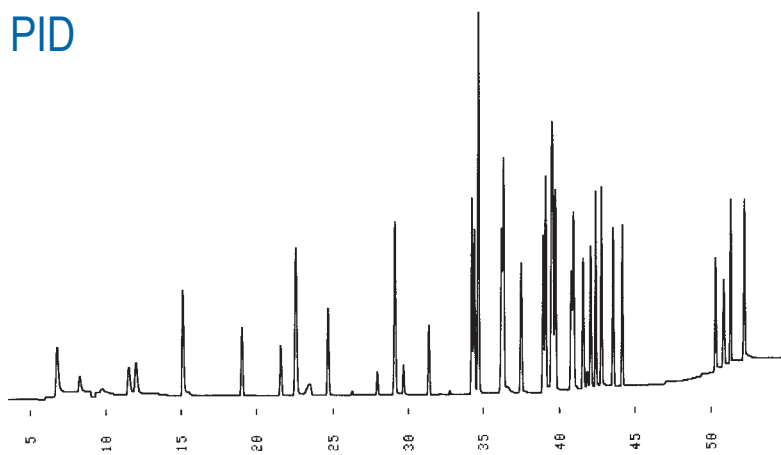
#### Concentrator

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

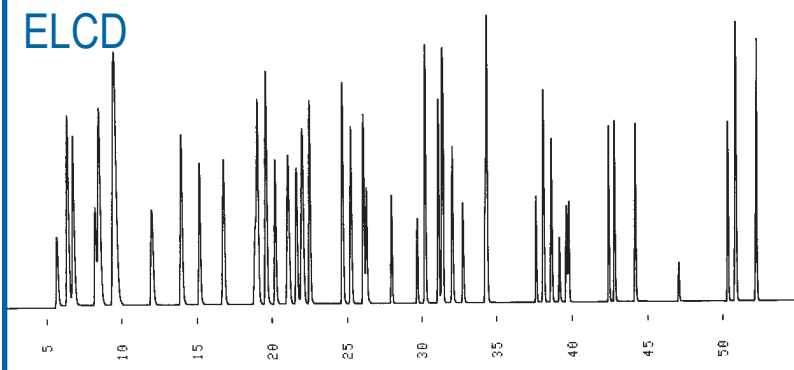
### Column

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

### PID



### ELCD



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

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

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