

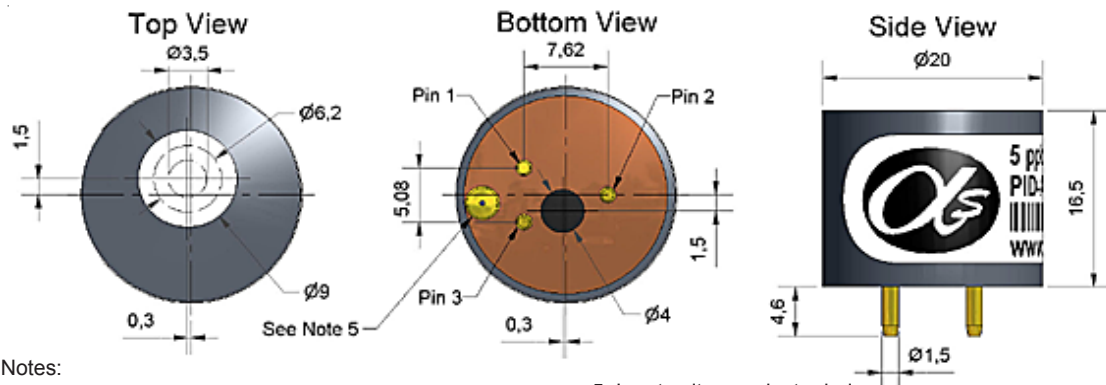


## PID-AH Photo Ionisation Detector



US patent 7,046,012  
US patent 7,821,270  
EU patent 1474681  
Other patents

**Figure 1 PID-AH Schematic Diagram**



Notes:

- Do not obstruct  $\varnothing 3.5$  sensing area
- Seal between  $\varnothing 6.2$  and  $\varnothing 9.0$  (if different to atmosphere)
- Pin out details:  
Pin 1: + V supply (See note 5)  
Pin 2: Signal output  
Pin 3: 0V supply
- All dimensions  $\pm 0.1$ mm unless otherwise stated
- Input voltage selector hole:  
a) When filled with solder the onboard regulator is disabled.  
A regulated supply of 3.0 - 3.6V (typically 3.3V) is then required.  
b) When not filled with solder the onboard regulator is enabled.  
A regulated or unregulated supply between 3.6 - 10 V is then required for IS applications, or up to 18 V for non-IS applications.  
**Nomally shipped with regulator enabled.**

### PERFORMANCE

Target gases	VOCs with ionisation potentials < 10.6 eV		
Minimum detection level	(ppb isobutylene)		1
Linear range	(ppm isobutylene)	(3% deviation)	50
Overrange	(ppm isobutylene)		50
Sensitivity	(linear range)	(mV / ppm Isobutylene)	> 20
Full stabilisation time	(minutes to 20 ppb)		20
Warm up time	(seconds)	time to full operation	5
Offset voltage	(mV variable between detectors)		52 to 70
Response time ( $t_{90}$ )	(seconds)	diffusion mode	< 3

### ELECTRICAL

Power consumption	110 mW (typical) at 3.3 V, 300 mW transient for 200 msec on switch-on
Supply voltage	3.0 to 3.6 VDC Ideally regulated $\pm 0.01$ V (onboard regulator disabled) 3.6 to 10 VDC (onboard regulator enabled) (maximum 10V for IS approval, maximum 18 V for non-IS)
Output signal	Offset voltage (minimum 50 mV) to Vmax (Vmax = Vsupply - 0.1 V when regulator is enabled)

### ENVIRONMENTAL

Temperature range	-40°C to +55°C (Intrinsically Safe); -40°C to +65°C (non-IS)		
Temperature dependence	0°C to 40°C	90% to 100% of signal at 20°C	
	-20°C	140% of signal at 20°C	
Relative humidity range	Non-condensing		0 to 95%
Humidity sensitivity	During operations: 0% to 75% rh transient		near zero

### KEY SPECIFICATIONS

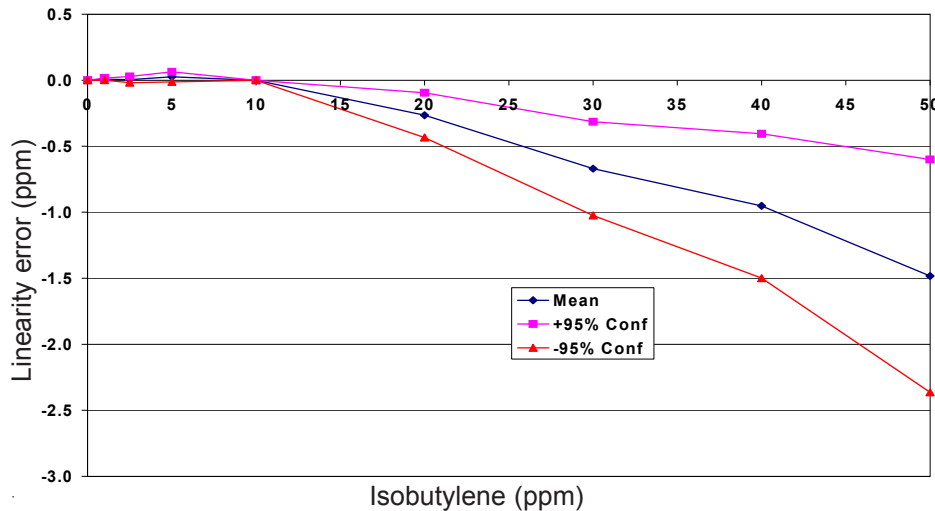
Operating life	5 years (excluding replaceable lamp and electrode stack)
IS Approval	IECEX Ex ia IIC T4; ATEX Ex ia II 1G -40°C < Ta < +55°C (< 10VDC supply)
Onboard filter	To remove liquids and particulates
Lamp	User replaceable
Electrode stack	User replaceable
Error state signal	Lamp out: 35 mV
Package type	Alphasense™ CH-A3 or City Technology™ 4P
Weight	< 8g
Position sensitivity	None
Warranty period	Electronics and housing: 24 months Lamp and electrode stack are user replaceable. 10.6eV lamp: 5,000 lit hours

**NOTE:** all sensors are tested at ambient environmental conditions, unless otherwise stated. As applications of use are outside our control, the information provided is given without legal responsibility. Customers should test under their own conditions, to ensure that the sensors are suitable for their own requirements.



## PID-AH Performance Data

**Figure 2 Linearity to Isobutylene**



Reduced sensitivity at higher concentrations is a chemical/physical effect and can be corrected in software for a specific VOC.

Non-linearity correction depends on the VOC being measured.

**Figure 3 Selecting the right lamp**

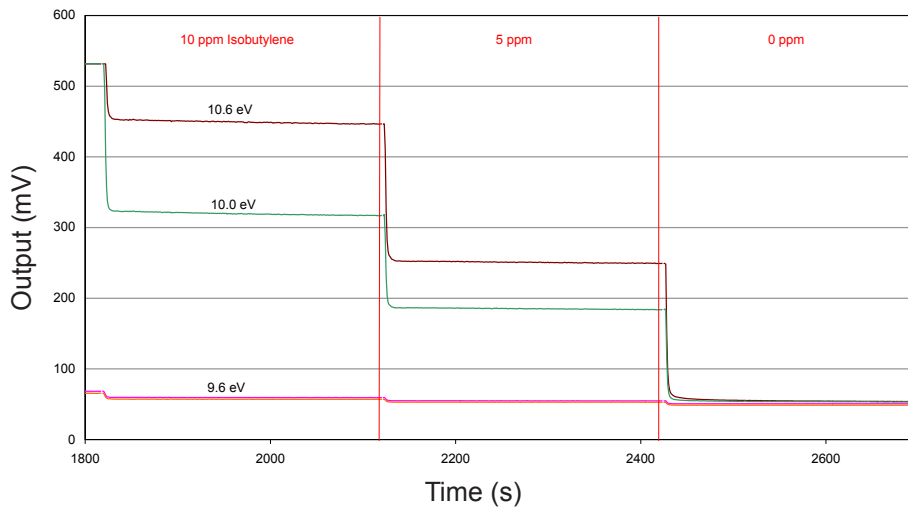


Figure 3 compares the output to 5 and 10ppm Isobutylene for 9.6 eV, 10.0 eV and 10.6 eV lamps.

9.6eV lamps are slightly more selective for BTEX detection, but 10.0 eV lamps give better sensitivity.

Technical Specification

### PID Replaceable Parts/Consumables List

PART	PART NUMBER
Lamp 10.6 eV	PID-LP 10.6
Lamp 10.0 eV	PID-LP 10.0
Lamp 9.6 eV	PID-LP 9.6
Electrode Stack	PID-EH
Cleaning Kit	PID-CK
Stack Removal Tool	PID-RT
Lamp Spring	PID-SP



At the end of the product's life, do not dispose of any electronic sensor, component or instrument in the domestic waste, but contact the instrument manufacturer, Alphasense or its distributor for disposal instructions.

For further information on the performance of this sensor, on other sensors in the range or any other subject, please contact Alphasense Ltd. For Application Notes visit "[www.alphasense.com](http://www.alphasense.com)".

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