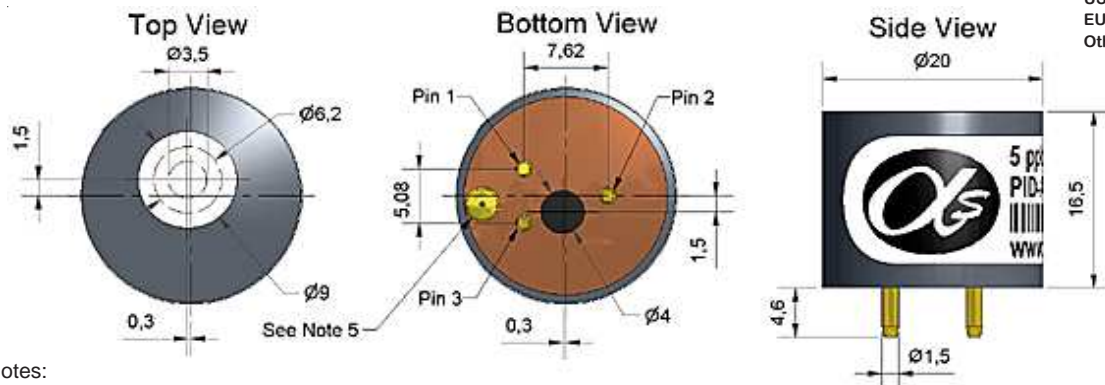




# PID-AH2 Photo Ionisation Detector



Figure 1 PID-AH2 Schematic Diagram



Notes:

1. Do not obstruct  $\varnothing 3.5$  sensing area
2. Seal between  $\varnothing 6.2$  and  $\varnothing 9.0$  (if different to atmosphere)
3. Pin out details:  
Pin 1: + V supply (See note 5)  
Pin 2: Signal output  
Pin 3: 0V supply
4. All dimensions  $\pm 0.1\text{mm}$  unless otherwise stated

5. Input voltage selector hole:

- a) When filled with solder the onboard regulator is disabled.  
A regulated supply of 3.2 - 3.6 V (typically 3.2 V) 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 which will be internally regulated to 3.3V.

**Normally shipped with regulator enabled.**

**PERFORMANCE** (using 10.6 eV lamp 001-0019-04)

Target gases	VOCs with ionisation potentials < 10.6 eV	
Minimum detection level	ppb isobutylene	1
Linear range	ppm isobutylene	3% deviation 40
Overrange	ppm isobutylene	40
Sensitivity	linear range	mV / ppm Isobutylene > 25
Full stabilisation time	minutes to 20 ppb	5
Warm up time	seconds	time to full operation 5
Offset voltage	mV variable between detectors	46 to 60
Response time ( $t_{90}$ )	seconds	diffusion mode < 3

**ELECTRICAL**

Power consumption	Onboard regulator enabled (default): < 100 mW at 3.6 V, < 550 mW transient for 200ms
(at switch on)	Onboard regulator disabled: < 85 mW at 3.2 V, < 300 mW transient for 200ms
Supply voltage	3.2 to 3.6 VDC Ideally regulated $\pm 0.01\text{V}$ (onboard regulator disabled)
	3.2 to 10 VDC (onboard regulator enabled)
	(maximum 10V for IS approval, maximum 18 V for non-IS)
Output signal	Offset voltage (minimum 46 mV) to $V_{\text{max}}$
	( $V_{\text{max}} = V_{\text{supply}} - 0.15\text{ V}$ when regulator is disabled, or 3.15 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 < $T_a$ < +55°C (< 10VDC supply)
Onboard filter	To remove liquids and particulates
Lamp	User replaceable
Electrode stack	User replaceable
Error state signal	Lamp out: n/a
	Electronic error : 41 $\pm$ 3
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-AH2 Performance Data

Figure 2 Linearity to Isobutylene at 3.6 V

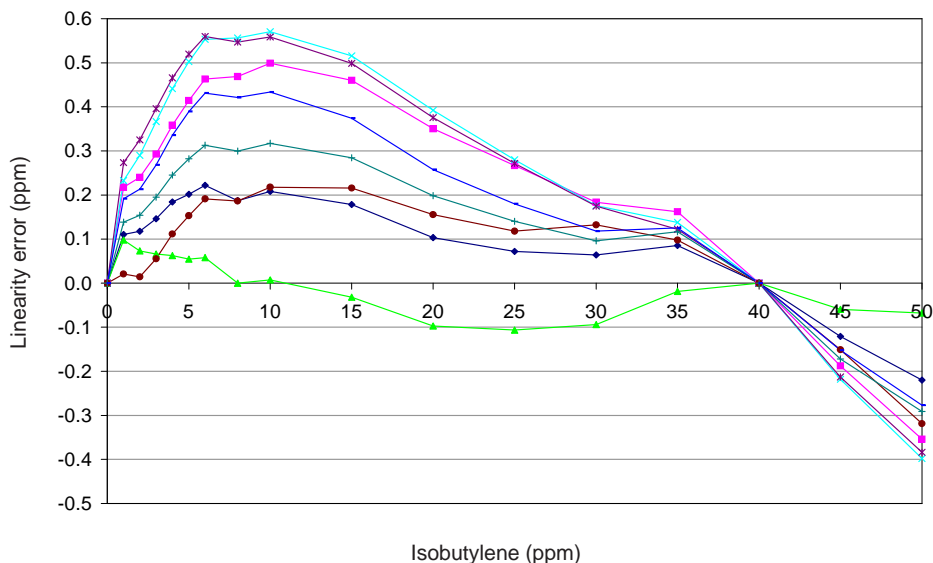


Figure 2 shows reduced sensitivity at higher concentrations is a chemical/physical effect and can be corrected in software for a specific VOC.

Non-linearity correction depends on the VOC being measured.

Figure 3 Selecting the right lamp

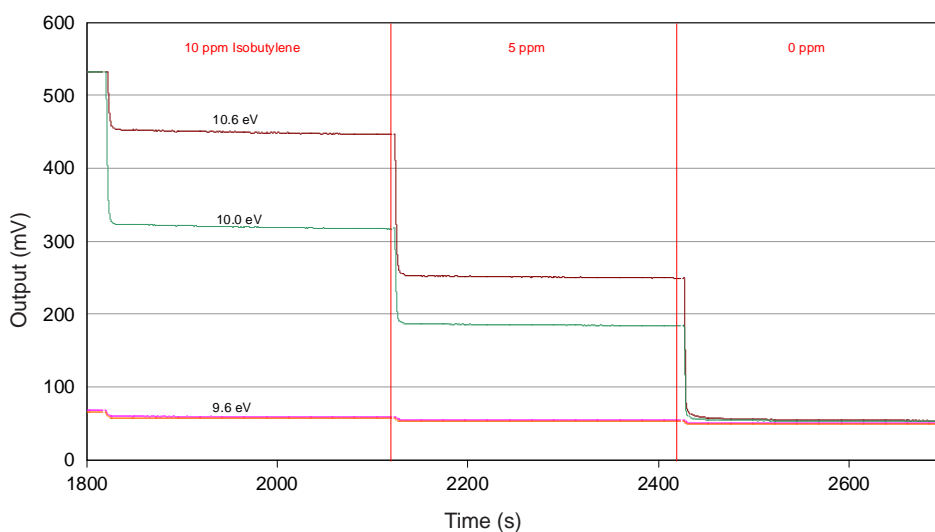


Figure 3 compares the output to 5 and 10 ppm Isobutylene for 9.6eV, 10.0eV and 10.6eV lamps.

Table 1: PID Replaceable Parts/Consumables List

Lamp type	Product code	Minimum sensitivity mV/ppm	Minimum range ppm isobutylene	Lamp life lit hours
9.6 eV	001-0030-00	0.25	8,000	TBD
10.0 eV	001-0030-02	10	100	5,000
10.6 eV (HPPM)	001-0019-04	25	40	5,000
10.6 eV (LLHS)	001-0030-01	25	40	5,000
Electrode stack	001-0018-01			
Stack removal tool	001-0020-00			
Lamp spring	001-0023-00			
Lamp cleaning kit	001-0024-00			

Customer information:				
Part No	Regulator	Lamp	Usage voltage	Certified
PID-AH2	Disabled	HPPM 10.6 eV	3.2 to 3.6	Yes
PID-AH2	Enabled	HPPM 10.6 eV	3.6 to 10 (10.1 to 18)	Yes (NO)
PID-AH20	Disabled	LLHS 10.6 eV	3.2 to 3.6	Yes
PID-AH20	Enabled	LLHS 10.6 eV	3.6 to 10 (10.1 to 18)	Yes (NO)
PID-AH29	Disabled	9.6 eV	3.2 to 3.6	Yes
PID-AH29	Enabled	9.6 eV	3.6 to 10 (10.1 to 18)	Yes (NO)
PID-AH2X	Disabled	10.0 eV	3.2 to 3.6	Yes
PID-AH2X	Enabled	10.0 eV	3.6 to 10 (10.1 to 18)	Yes (NO)



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)".

In the interest of continued product improvement, we reserve the right to change design features and specifications without prior notification. The data contained in this document is for guidance only. Alphasense Ltd accepts no liability for any consequential losses, injury or damage resulting from the use of this document or the information contained within. (©ALPHASENSE LTD ) Doc. Ref. PID-AH2/AUG19