

PID-A1 Photo Ionisation Detector

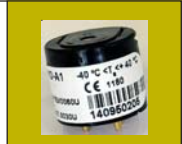
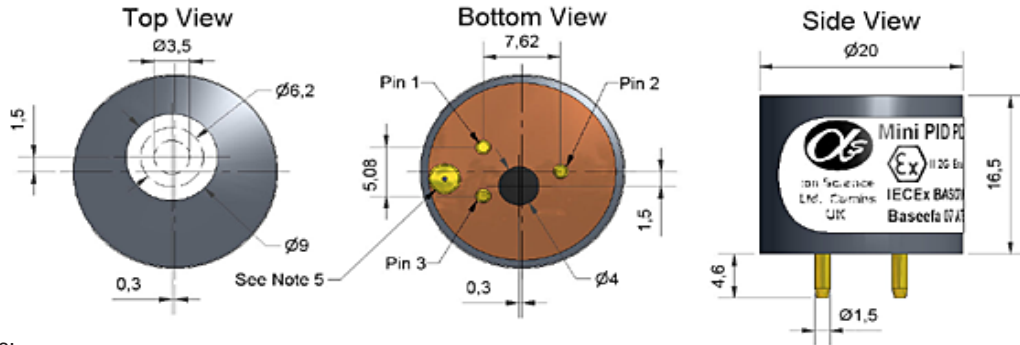


Figure 1 PID-A1 Schematic Diagram



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

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: 0 V supply
- All dimensions ± 0.1 mm unless otherwise stated
- Input voltage selector hole:
 - a) When filled with solder the onboard regulator is disabled. A regulated supply of 2.8 - 3.6 V (typically 3.0 - 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 voltage supplies between 10 V and 19 V, contact Alphasense

Normally shipped with regulator disabled..

PERFORMANCE

Target gases	VOCs with ionisation potentials < 10.6 eV	
Minimum detection level	(ppb isobutylene)	100
Linear range	(ppm isobutylene)(5% deviation)	300
Overrange	(ppm isobutylene)	6,000
Sensitivity	(linear range) (mV / ppm Isobutylene)	> 0.6
Full stabilisation time	(minutes to 100 ppb)	20
Warm up time	(seconds) time to full operation	5
Offset voltage	(mV)	52 to 57
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 ± 0.01 V (onboard regulator disabled) 3.6 to 10 VDC (onboard regulator enabled) (maximum 10V for IS approval)
Output signal	Offset voltage to V_{max} ($V_{max} = V_{supply} - 0.1$ V)

ENVIRONMENTAL

Temperature range	-40°C to +55°C (Intrinsically safe); -40°C to +65°C (Non IS)
Temperature dependence	0°C to 40°C 95% to 100% of signal at 20°C -20°C 125% of signal at 20°C
Relative humidity range	non-condensing 0 to 95%
Humidity sensitivity	Near zero

KEY SPECIFICATIONS

Expected 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 replacement	User replaceable (10.6 eV) (Optional 9.6 eV and 10.0 eV lamps)
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

Technical Specification

PID-A1 Performance Data

Technical Specification

Figure 2 Sensitivity Temperature Dependence

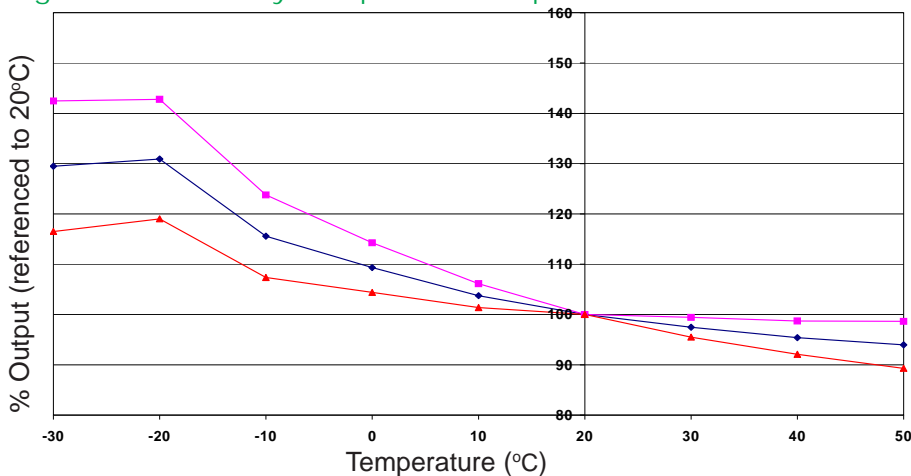
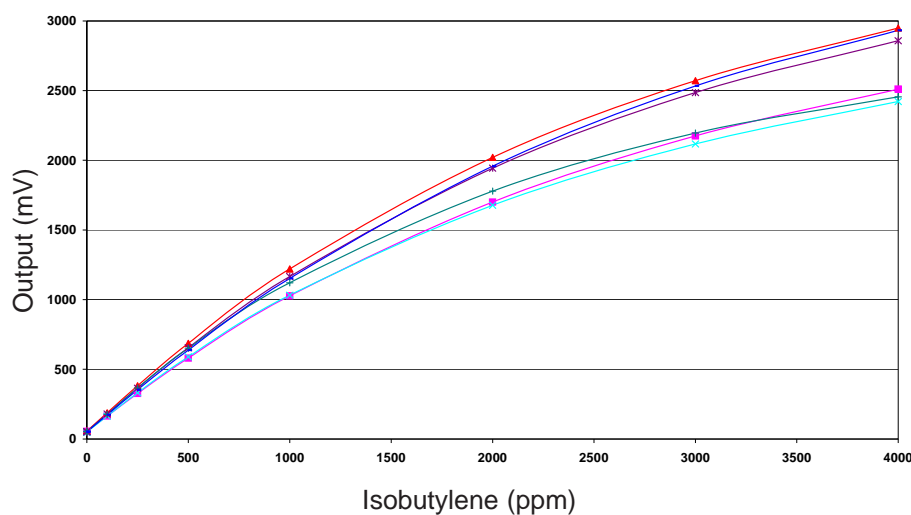


Figure 2 shows the temperature dependence, corrected for the gas law.

This data is taken from a typical batch of PID-A1 sensors tested with 100ppm Isobutylene.

The mean and $\pm 95\%$ confidence intervals are shown.

Figure 3 Linearity to Isobutylene



PID output is non-linear at higher concentrations but can be corrected in software for a specific VOC.

Non-linearity depends on the VOC being measured.

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-ES
Cleaning Kit	PID-CK
Stack Removal Tool	PID-RT
Lamp Spring	PID-SP

