MiniPID 2

Photoionisation Detection (PID) sensor technology

Typical Applications

- Personnel safety
- Industrial hygiene
- Site soil and air sampling
- Fugitive emissions and volatile spills
- Law enforcement
- Emergency response

Key Features

- Humidity-resistance
- Anti-contamination design
- Exceptionally linear wide range 'PPM' model
- Low drift high sensitivity 'PPB' model
- 10 eV, 10.6 eV and 11.7 eV lamps available
- Removable, pneumatically sealed sensing pellet
- Series 4/A1 format
- 12 month warranty (not including stacks)
- Expected life > 5 years
- Manufactured in the UK

Patents

- US: 7,046,012
- EU: 1474681

State of the art PID technology

The Ion Science MiniPID 2 is a simple plug-and-play sensor able to deliver dynamic and dependable response to thousands of volatile organic compounds (VOCs) in many diverse applications.

All MiniPID sensors include patented Fence Electrode Technology for industry leading humidity resistant performance and Anti-contamination design protecting the sensor from moisture, dust and aerosols.

The sensor is designed for both diffusive and in-line pumped sampling, delivering an exceptional response time and clear down.

MiniPID 2 incorporates lamps of exceptional brightness and stability enabling detection of less volatile and less readily sensed compounds reliably, over an extended period of time.

PPM MiniPID 2: range 0.1 - 6000 ppm

The PPM variant is used for wide range, part per million (ppm) measurements between 0.1 and 6000 ppm (isobutylene equivalent). This sensor is configured specifically for dynamic response to VOCs at elevated concentrations allowing for greater accuracy and repeatability.

PPB MiniPID 2: range 1 ppb - 40 ppm

The PPB variant is used for high sensitivity in the part per billion (ppb) range with minimum detection limit of 1 ppb. The PPB sensor is optimised to deliver an exceptionally low background current allowing for optimum low-end sensitivity.

10 eV MiniPID 2: range 5 ppb - 100 ppm

The 10 eV is new to our 3-pin product range and is used for enhanced selectivity of compounds with lower ionisation potentials. A common usage of the 10 eV sensor is for the determination of ambient levels of aromatic compounds.

11.7 eV MiniPID 2: range 0.1 to 100 ppm (isobutylene equivalent)

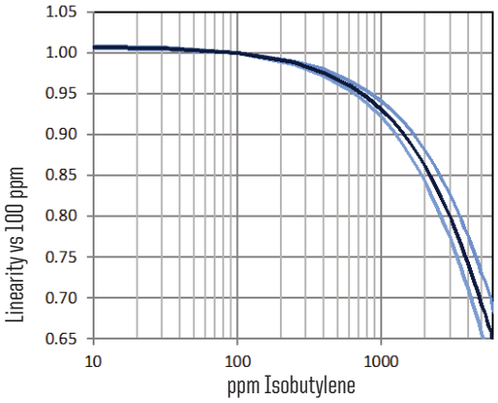
Available from Ion Science is the 11.7 eV lamp which extends the range of detectable compounds to include chloro-carbons, CFCs, formaldehyde and chlorine amongst others.

Performance

	PPB MiniPID 2	PPM MiniPID 2	10 eV MiniPID 2
Pellet colour	White	Blue	White + gold spot
Minimum detection limit	1 ppb	0.1 ppm	5 ppb
Range	40 ppm	6000 ppm	100 ppm
Linearity	>98% over measurement range	>98% up to 100 ppm 88% at 1000 ppm 75% at 4000 ppm	>98% over measurement range
T90 response time	3 s		
Typical responsivity	25 mV/ppm	0.7 mV/ppm	10 mV/ppm
Offset voltage	60 - 80 mV	52 - 55 mV	52 - 57 mV
Output voltage	Offset voltage to rail voltage - 0.1 V		
Power consumption	110 mW at 3.3V (100 ms 130 mA transient upon switch on)		
Temperature range	-40°C < T < 55°C		
Humidity range	0 - 99% RH, non-condensing		
Humidity sensitivity	Humidity resistant		
Expected life	> 5 years (excluding replaceable lamp and pellet)		
Warranty period	12 months		

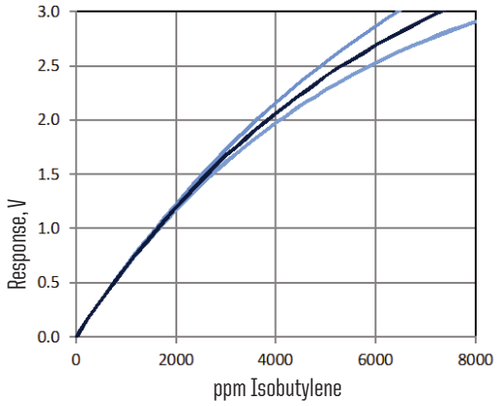
Typical HPPM MiniPID 2 linear range

Note: blue lines denote +1σ performance deviation



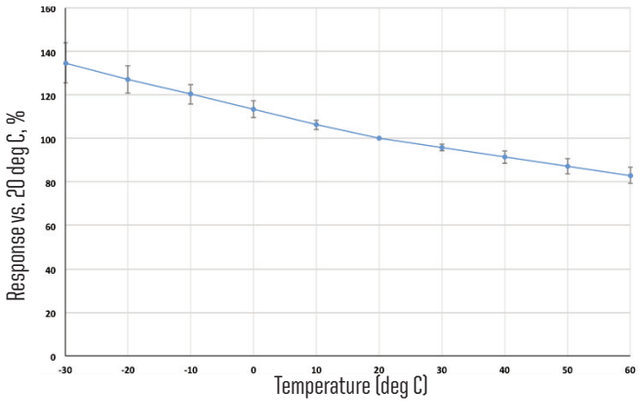
Typical response graph

Note: blue lines denote +1σ performance deviation

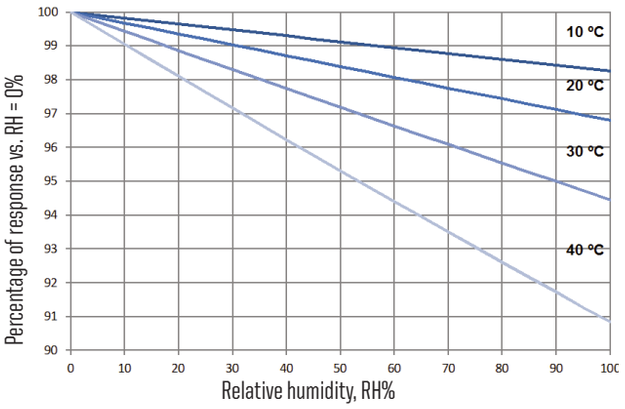


Temperature effect on response of a MiniPID 2

Note: error bars denote +2σ performance deviation



Natural physical effect on response of a MiniPID 2



Water is not itself detected by MiniPID 2, but it adsorbs a portion of the light that otherwise promotes a response from a photoionisable gas.

Intrinsic Safety

All our MiniPIDs are supplied with a choice of three different Intrinsic Safety ratings

Safety certification	ULCSA & ATEX	ATEX	Non-certified
Supply voltage	3.0 - 3.6 V unregulated	3.6 - 10 V regulated	3.6 - 18 V regulated

For '**ULCSA & ATEX**' certified MiniPID 2s the rail voltage, and hence performance of the MiniPID, will be dependent upon the supply voltage level between 3.0 and 3.6 V. A low voltage supply will increase the lifetime of the lamp within the PID, a high voltage will slightly increase sensitivity. It is important the power supply is noise-free to ensure optimum performance.

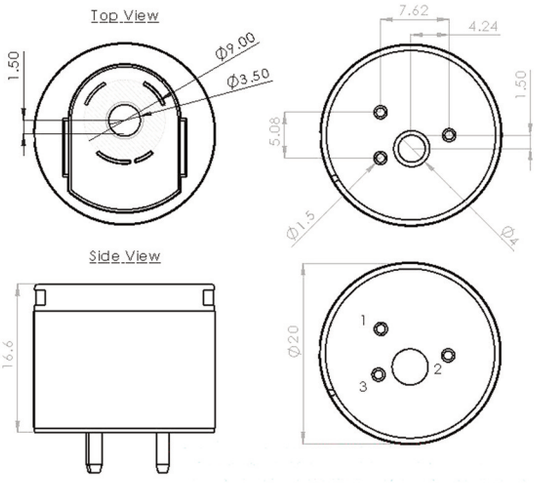
For '**ATEX**' and '**non-certified**' ratings the power supply is regulated internally to the PID, therefore the MiniPID performance is independent of the supply voltage.

Due to ATEX regulations the ATEX certified PID can only be supplied with a maximum of 10.0 V.

Physical properties

The outside dimensions and pin configuration allow the sensor to be easily inserted into an industry standard series-4 LEL socket.

The pellet removal tool is provided which slots within the cavities either side of the pellet (see side view) to allow ease of release. The pellet is held in place by push-fit winged clips.



PIN details

1 = positive supply voltage
2 = signal output
3 = 0V ground

Weight

< 9g

The pellet

Our electrode stack design is at the heart of our pellet and incorporates our patented Fence Electrode Technology making the MiniPID 2 resistant to false responses in humid atmosphere. The electrode stack is encapsulated in an easily removable pellet design ensuring ease of service as a moderately priced replaceable component.

The pellet is designed with a sealing face which allows the sensor to be easily installed downstream from a pumped source.

Gas access into the pellet is through a diffusive hydrophobic filter which prevents particulate and liquid ingress.

The lamp

All our product range is supplied with a 6 mm glass 10.6 eV lamp filled with ultra-pure krypton gas. Our in-house developed 'getter' within the lamp ensures that impurities which would otherwise build up within the lamp are removed from the bulb interior. This results in an extended and more stable lifetime. Our 10 eV Model is achieved by insertion of a 10 eV filter window into the pellet thereby allowing the use of a standard 10.6 eV lamp.

Our lamps are manufactured on our premises, ensuring complete control over quality, performance and production.

Order code

Model	Intrinsic safety (IS)	Supply voltage	Order code
ppm	ULCSA & ATEX	3.0 - 3.6 V unregulated	MP3SM6LBU
	ATEX	3.6 - 10 V regulated	MP3SM6LCU
	non-certified	3.6 - 18 V regulated	MP3SM6LNU
ppb	ULCSA & ATEX	3.0 - 3.6 V unregulated	MP3SB6BBU
	ATEX	3.6 - 10 V regulated	MP3SB6BCU
	non-certified	3.6 - 18 V regulated	MP3SB6BNU
10 eV	ULCSA & ATEX	3.0 - 3.6 V unregulated	MP3SB60BU
	ATEX	3.6 - 10 V regulated	MP3SB60CU
	non-certified	3.6 - 18 V regulated	MP3SB60NU

Replaceable parts

Description	Part number
PPB pellet	BSF
10.6 eV lamp + HPPM stack	LA42SM60
Pellet removal tongs	846216
Lamp cleaning kit	A-31063
10.0 eV pellet	A-846417

Certifications

ATEX, IECEx Ex II 1G Ex ia IIC T4
CLASS1, DIV1 Groups ABCD, Conforms to UL STD. 913
Certified to CSA STD. C22.2 No 157
-40°C < Ta < +55°C @ 1.1W (65°C @ 0.9w)

Products containing the unique MiniPID 2 sensor and Ion Science humidity resistant Fence Electrode Technology:

- Titan benzene specific monitor
- Tiger handheld VOC detector
- Tiger Select VOC detector
- Cub personal VOC monitor
- Cub[TAC] personal monitor for Total Aromatic Compounds, including benzene
- TVOC® fixed VOC detector
- Corvus continuous VOC monitor

Also available from Ion Science is the revolutionary series-4 11.7 eV lamp. For more information, or to place an order please contact Ion Science.

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