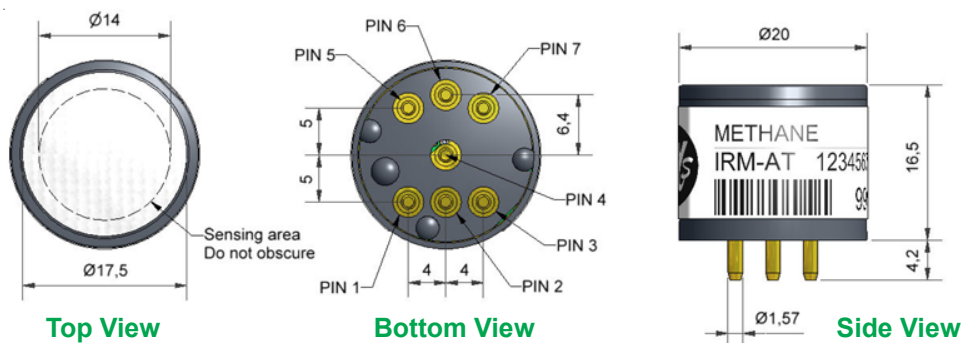


IRM-AT METHANE INFRARED SENSOR Thermopile Detector



Figure 1 IRM-AT Schematic Diagram



All dimensions in millimetres ($\pm 0.15\text{mm}$)

Pin out details:

1. Lamp return
2. Lamp +5V
3. Not connected
4. Detector output
5. Reference output
6. Thermistor output
7. OV supply

Notes:

1. Dimensions without tolerances are nominal
2. Recommended PCB socket: Wearnes Cambion Ltd. code: 450-3326-01-06-00
3. Weight: < 15g
4. Use antistatic precautions when handling
5. Do not cut pins
6. Do not solder directly to pins

PERFORMANCE

Maximum Power Requirements	5.0 VDC, 60 mA max. (50% duty cycle source drive)
Minimum Operating Voltage	2.0 VDC, 20 mA max. (50% duty cycle source drive)
Source Drive Frequency	3 Hz typical, 50% duty cycle
Active/Reference Output in Air (peak-to-peak)	2 to 4 mV @ 3 Hz, 50% duty cycle
Typical active signal change for 2.5% CH ₄	5% drop (typical) @ 5 V, 3 Hz, 50% duty cycle
Typical active signal change for 100% CH ₄	30% drop (typical) @ 5 V, 3 Hz, 50% duty cycle
Response Time (t_{90})	< 40 s @ 20°C ambient
Warm-up Time	30 minutes @ 20°C, 5 VDC

LIFETIME

MTBF @ 5 VDC > 3 years

KEY SPECIFICATIONS

Temperature Signal	Integral thermistor (NTC, $R_{25} = 100\text{K}\Omega$, $\beta = 3940\text{ K}$)
Operating Temperature Range	-20°C to +50°C (linear compensation from 0 to 40°C)
Storage Temperature Range	-40°C to +75°C
Humidity Range	0 to 95% RH non-condensing

Range	0 - 2.5%	0 - 100%*
Accuracy	< ± 500 ppm	< $\pm 1\%$ vol
Resolution at zero	< 200 ppm	< 300 ppm
Resolution at range	< 400 ppm	< 2.5% vol
Zero repeatability	< ± 500 ppm	< $\pm 1,000$ ppm
FS repeatability	< $\pm 0.1\%$ vol	< $\pm 2\%$ vol
Limit of detection	< 500 ppm	< 1,000 ppm
Span coefficient	0.074 - 0.094	1.1 - 1.3 @ 95%
Linearisation coefficient b	0.38	0.025
Linearisation coefficient c	0.98	0.553

* NOTE: due to the incandescent IR source within the sensor, this device should NOT be used for applications where there is a possibility of the presence or formation of an explosive mixture of methane and/or other flammable gases with an oxidant such as air.



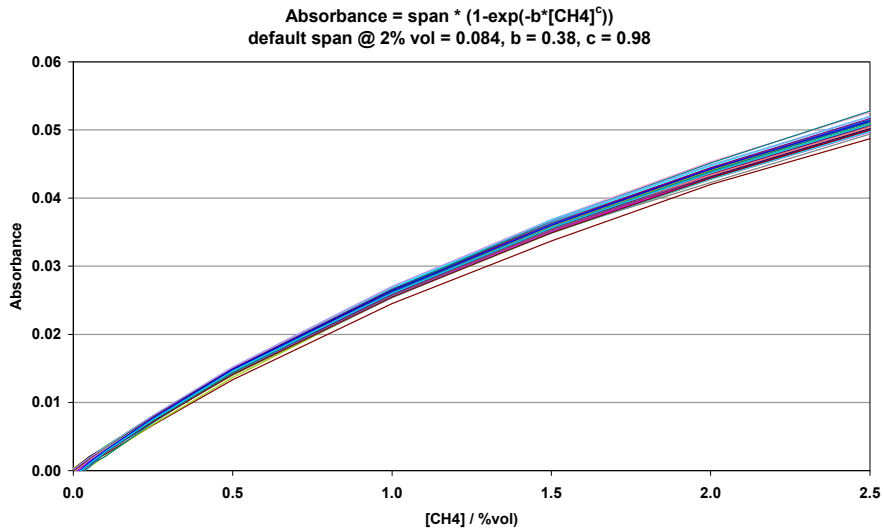
At the end of the product's life, do not dispose of any electronic sensor, component or instrument in the domestic waste, but contact the instrument manufacturer, Alphasense or its distributor for disposal instructions.

Technical Specification

IRM-AT Performance Data

Technical Specification

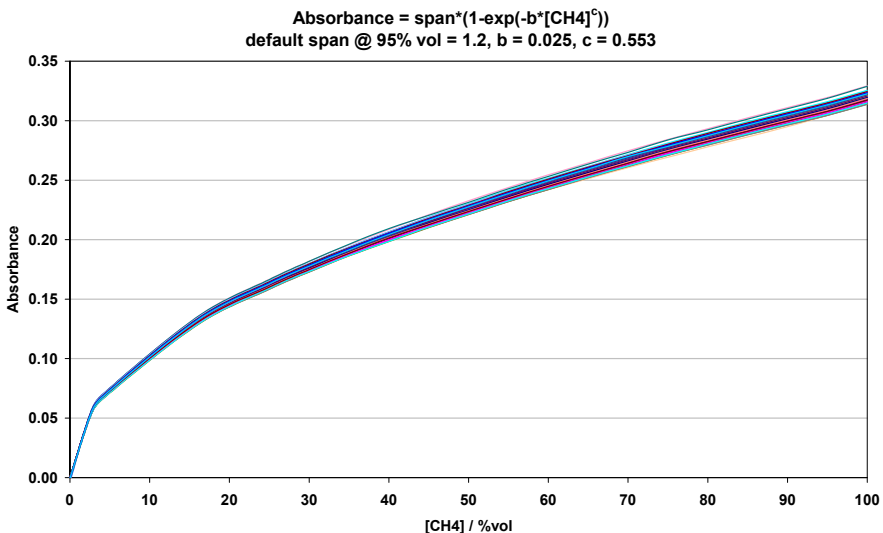
Figure 2 Response up to 2.5% volume methane



Patented optical design gives repeatable and stable absorbancy, following the Beer-Lambert Law.

This allows universal linearisation, not reliant on custom EEPROMs.

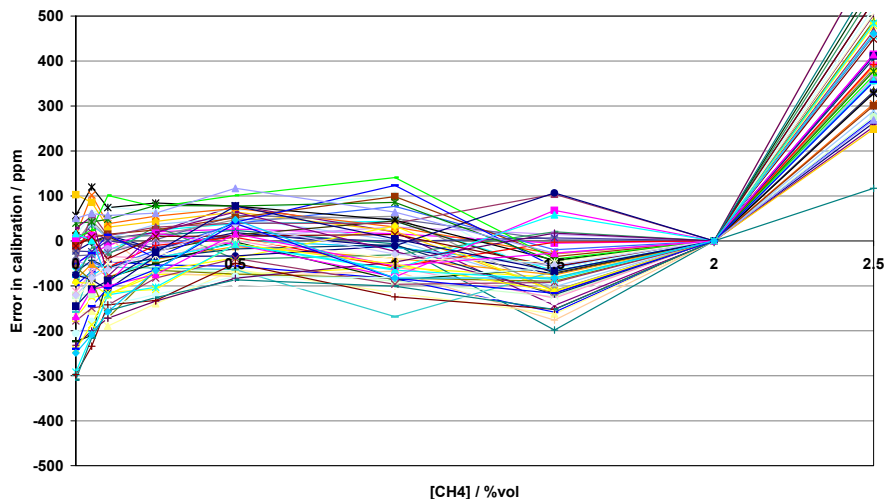
Figure 3 Response up to 100% methane



This NDIR methane sensor responds up to 100% methane but the housing is plastic so is not Ex approved.

However, the sensor could be placed in an Ex approved housing for applications where an explosive atmosphere is present or could develop.

Figure 4 Calibration error to 2.5% methane



Using universal linearisations, the IRC-AT error is less than 0.05% Methane.

Zero and 2% methane calibrations are required.