IRM-AT METHANE
INFRARED SENSOR
Thermopile Detector

Figure 1 IRM-AT Schematic Diagram

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% CH₄ 5% drop (typical) @ 5 V, 3 Hz, 50% duty cycle
Typical active signal change for 100% CH₄ 30% drop (typical) @ 5 V, 3 Hz, 50% duty cycle
Response Time (t₉₀) < 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, R₂₅ = 100KΩ, β= 3940 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 | < ± 1% vol |
| Resolution at zero | < 200 ppm | < 300 ppm |
| Resolution at range | < 400 ppm | < 2.5% vol |
| Zero repeatability | < ± 500 ppm | < ± 1,000 ppm |
| FS repeatability | < ± 0.1% vol | < ± 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.

Alphasense Ltd, Sensor Technology House, 300 Avenue West, Skyline 120, Great Notley, CM77 7AA. UK
Telephone: +44 (0) 1376 556 700 Fax: +44 (0) 1376 335 899 E-mail: sensors@alphasense.com Website: www.alphasense.com
Patented optical design gives repeatable and stable absorbancy, following the Beer-Lambert Law.

This allows universal linearisation, not reliant on custom EEPROMs.

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.

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

Zero and 2% methane calibrations are required.