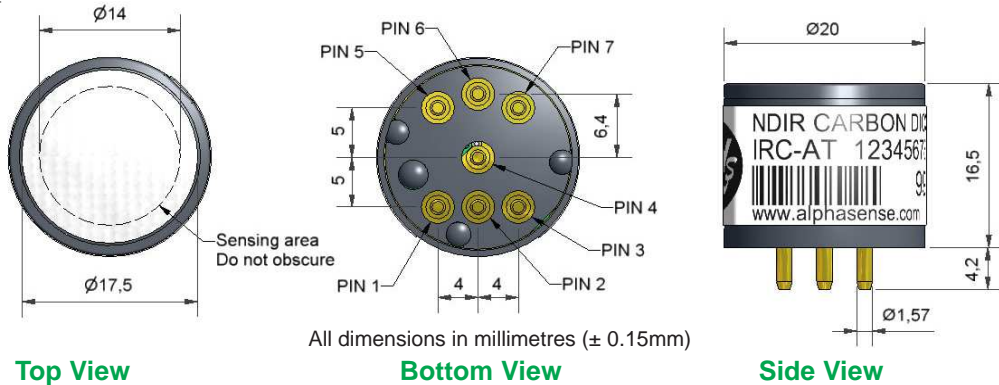




IRC-AT CARBON DIOXIDE INFRARED SENSOR Thermopile Detector



Figure 1 IRC-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
Active Output in N ₂ (peak-to-peak)	4 to 7 mV @ 3 Hz, 50% duty cycle
Reference Output in N ₂ (peak-to-peak)	2 to 5 mV @ 3 Hz, 50% duty cycle
Response Time (t ₉₀)	< 40 s @ 20°C ambient
Warm-up Time	To final zero ± 100 ppm: < 30 s @ 20°C To specification: < 30 minutes @ 20°C

LIFETIME

MTBF > 5 years

KEY SPECIFICATIONS

Temperature Signal	Integral thermistor (NTC, R ₂₅ = 100K Ω B= 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

TYPE*	Range (Application)	Accuracy (%FS, using universal linearisation coefficients)	Zero Resolution (ppm)	Full Scale Resolution (ppm)	Zero Repeatability (ppm)	Full Scale Repeatability (ppm)	Universal lin. coeff. b	Universal lin. coeff. c	Span calibration conc.
IAQ	0 to 5000ppm (IAQ)	1	10	50	± 20	± 50	0.000325	0.9363	4000 ppm
	0 to 5 % vol (Safety)	1.5	10	100	± 20	± 500	0.5411	0.6716	4%
Other	0 to 20 % vol (Combustion)	2.5	10	2000	± 20	± 2500	1.0459	0.2932	16%
	0 to 100 % vol (Process Control)	tbc	10	tbc	± 20	tbc	tbc	tbc	100%

* When ordering, select 'IAQ' or 'Other', depending on your application.



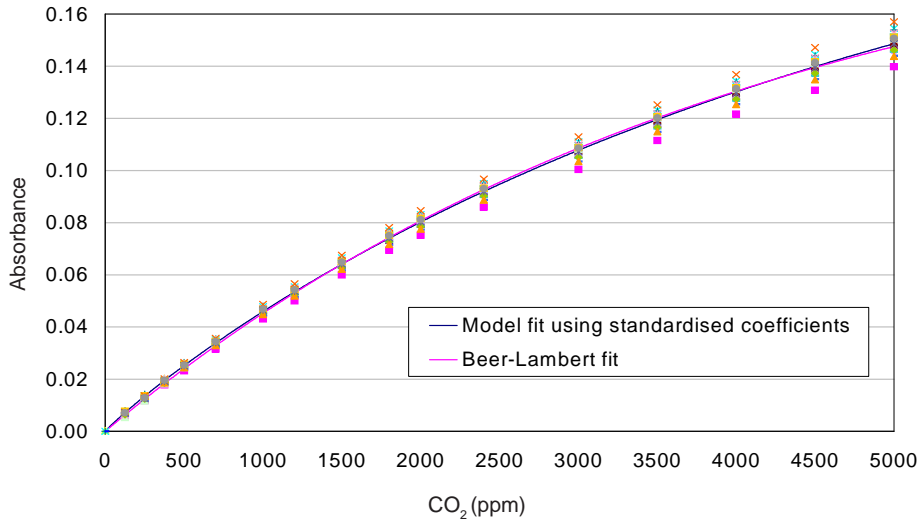
At the end of the product's life, do not dispose of any electronic sensor, component or instrument in the domestic waste, but contact the instrument manufacturer, Alphasense or its distributor for disposal instructions.



IRC-AT Performance Data

Technical Specification

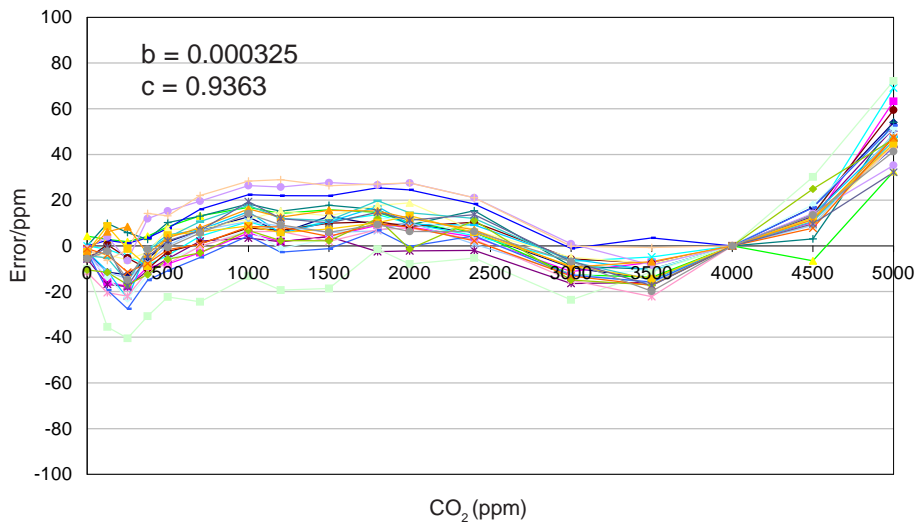
Figure 2 Beer Lambert Performance



Typical response from 0 to 5000ppm CO₂.

The fit is very close to the theoretical curve, predicted by the Beer-Lambert Law.

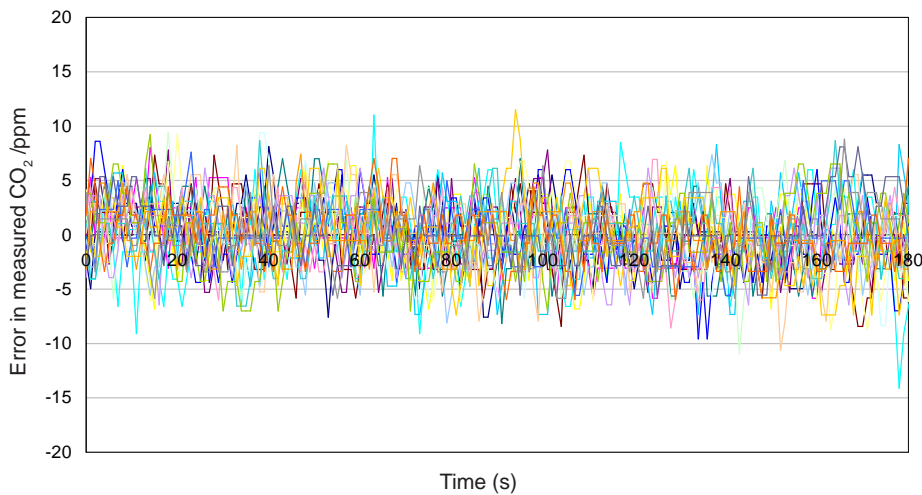
Figure 3 Linearisation



Custom linearisation is not necessary with the IRC-AT. Using universal linearisation constants, repeatability between cells is very good, allowing easy implementation.

For an IAQ application, a zero and then single calibration at 4000ppm CO₂ gives the error shown above: typically less than ± 40ppm from 0 to 4500ppm.

Figure 4 Resolution



Excellent resolution and noise at 1000ppm CO₂ for the IRC-AT is achieved by better design, not by using more expensive components.

ApolloSense Ltd