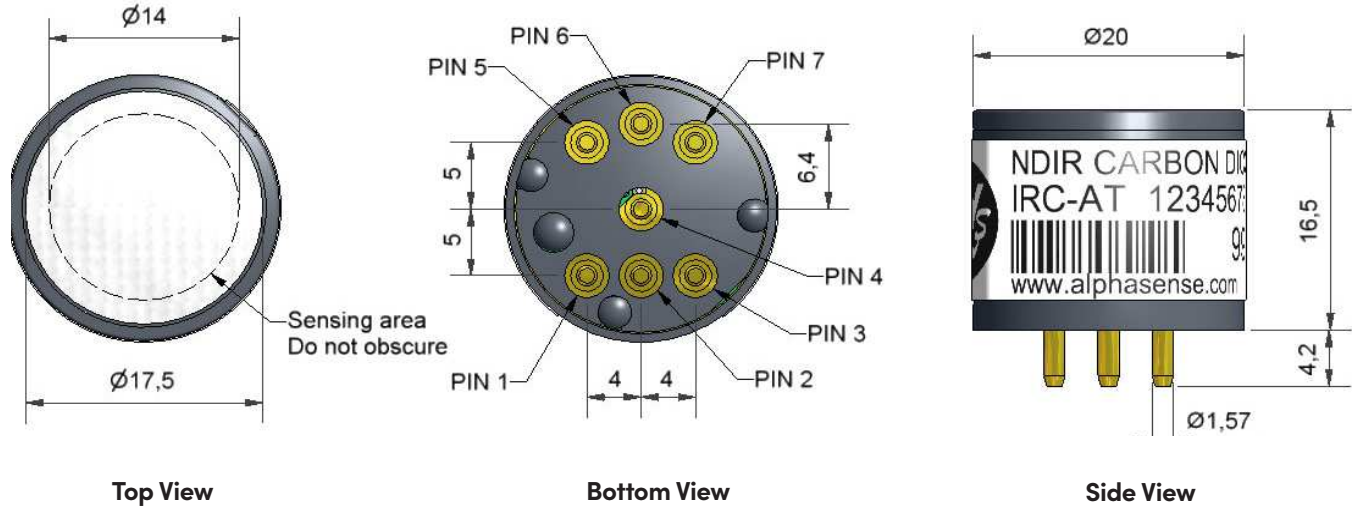


IRC-AT Carbon Dioxide infrared sensor – thermopile detector



Dimensions are in millimetres (± 0.15 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
7. We suggest this sensor is best used in a fixed site instrument where calibration and measurement can be carried out in-situ, and the sensor is not subject to acute mechanical stress or changes of temperature.

Performance

Maximum power requirements	5.0 VDC, 60mA max. (50% duty cycle source drive)
Minimum operating voltage	2.0 VDC, 20mA max. (50% duty cycle source drive)
Source drive frequency	3 Hz
Active output in N ₂ (peak-to-peak)	4 to 7mV @ 3 Hz, 50% duty cycle
Reference output in N ₂ (peak-to-peak)	2 to 5mV @ 3 Hz, 50% duty cycle
Response time (t ₉₀)	< 40s @ 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
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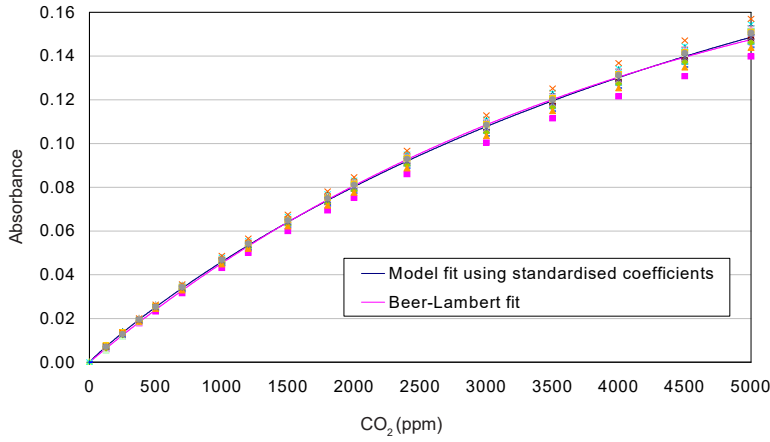
Key Specifications

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

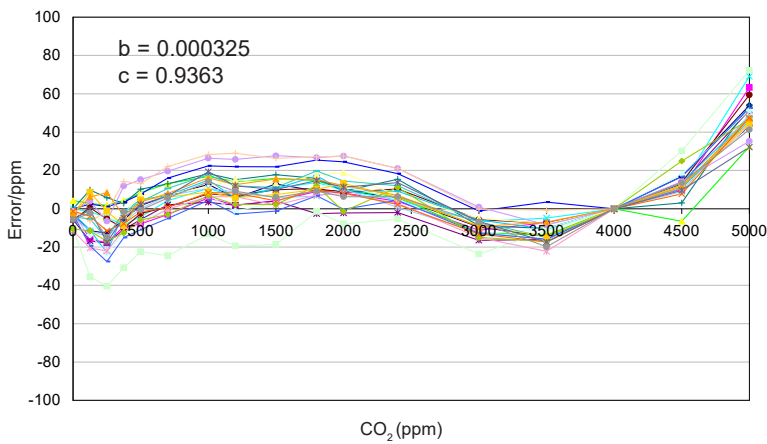
* When ordering, select 'IAQ' or 'Other', depending on your application.

Figure 1 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.

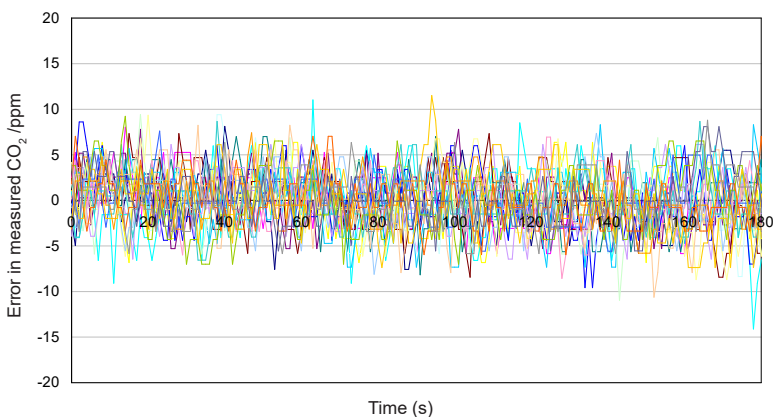
Figure 2 Linearisation



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 3 Resolution



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