

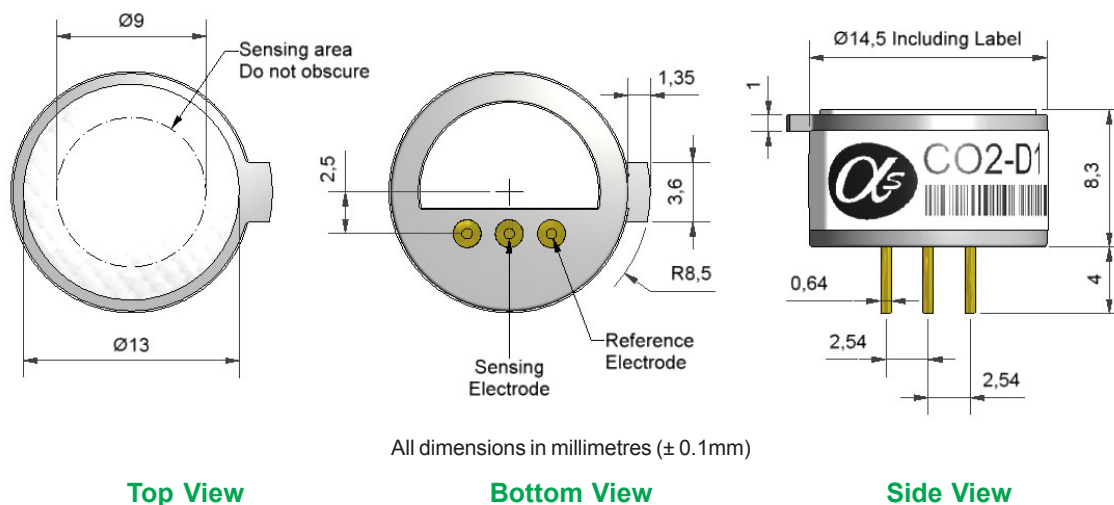
CO2-D1 Carbon Dioxide Sensor

Solid State



PATENTED

Figure 1 CO2-D1 Schematic Diagram



Top View

Bottom View

Side View

PERFORMANCE	Parameter	Specification	Value
PERFORMANCE	Sensitivity	mV/decade concentration change (0.5% to 5% CO ₂)	6 to 10
	Response time	t ₉₀ (s) for mV change (20°C)(0.5% to 5% CO ₂)	2-4 mins
	Zero	E ₀ @ 5000ppm CO ₂	-30 to +30mV
	Resolution	RMS noise (ppm equivalent) @ 5,000ppm CO ₂	100
	Range	CO ₂ concentration	0.5% to 90%
	Linearity	see Figure 3	Logarithmic

LIFETIME	Parameter	Specification	Value
LIFETIME	Zero drift	(mV)E ₀ change/day in lab air	± 3
	Sensitivity drift	mV/decade/month change in lab air, monthly test	< 1
	Operating life	months until 80% original signal (12 month warranted)	< 12

ENVIRONMENTAL	Parameter	Specification	Value
ENVIRONMENTAL	Temperature range	°C	10 to 35°C
	Pressure range	kPa	80 to 120
	Humidity range	% rh continuous	15 to 95

KEY SPECIFICATIONS	Parameter	Specification	Value
KEY SPECIFICATIONS	Storage period	months @ 0 to 20°C (stored in original container)	6
	Input	Impedance of op amp input	> 10 ⁸ Ω



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.

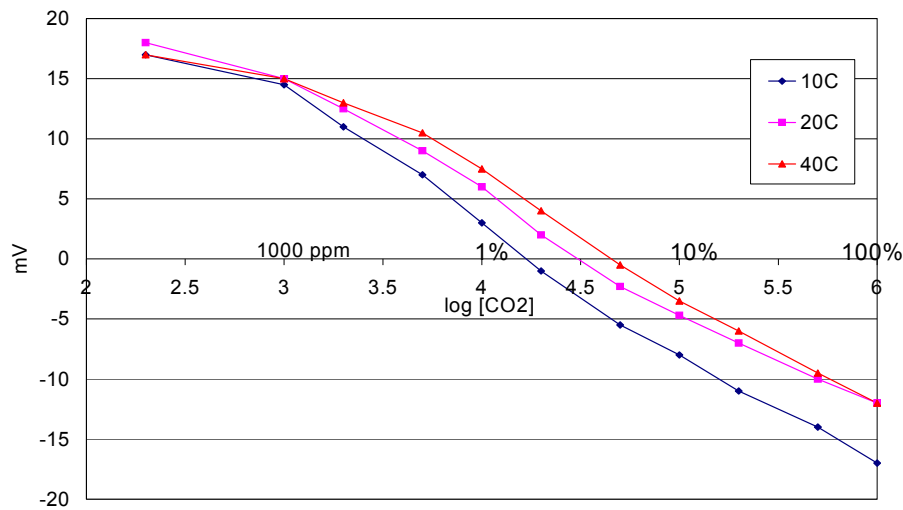
NOTE: all sensors are tested at ambient environmental conditions, with 10 ohm load resistor, unless otherwise stated. As applications of use are outside our control, the information provided is given without legal responsibility. Customers should test under their own conditions, to ensure that the sensors are suitable for their own requirements.

Technical Specification

CO2-D1 Performance Data

Technical Specification

Figure 2 Mastercurve



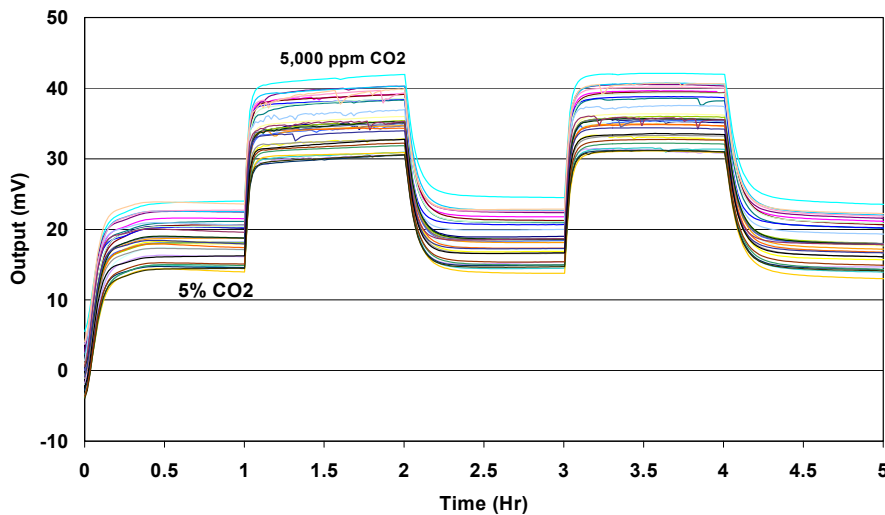
The CO₂-D1 is a potentiometric sensor and responds over four decades of CO₂ concentration.

Sensitivity (mV/decade concentration) is not constant, it changes with concentration: sensitivity increases at higher concentrations.

Sensitivity remains stable with time, but the offset voltage (E_0) will shift, so regular zeroing is advised.

Temperature affects E_0 but not the sensitivity from 10° to 40°C.

Figure 3 Hysteresis



Sensors were exposed first to 5000 ppm CO₂ then 5% CO₂ for 30 minutes.

Sensors return to the initial voltage with a fast initial response, followed by a slower stabilisation to the final voltage.

The absolute mV shifts with time and environment, so sensor should be calibrated regularly in fresh air (typically 400 ppm CO₂).

CO2-D1 Sensor Conditioning PCB

The CO₂-D1 is a potentiometric electrochemical gas sensor which responds to carbon dioxide as a gas ion selective electrode. The potential that is generated must not be measured using low impedance circuitry. Alphasense has developed a simple buffering circuit that conditions the potential to protect the CO₂-D1 from damage.

This conditioning board allows customers during validation and single users (research groups) to use a simple datalogger or DVM to monitor the sensor without causing damage to the sensor.

Power: CR2032 Li coin cell (3V) (20mm dia, 3.2mm ht. 165mA) located under the board

Power consumption: Approx. 30uA giving between 6 and 12 months continuous use

Output socket: 2-way screw terminal
Marked + and -. Suitable for feeding directly into a datalogger or DVM

