

CO₂ Engine® K30 FR

Fast Response CO₂ Sensor Module



CO₂ Engine® K30 FR is a high performance CO₂ sensor module optimised for fast response time. The sample cell is well protected by a particle filter and is designed for fast diffusion without any need for external pump. In addition, there is a tube inlet to be able to feed on-line test gas through the sensor.

The module is designed for high volume production with full traceability by sensor serial number on all manufacturing processes and key components. Every sensor is individually calibrated and is provided with UART digital interface.

STANDARD SPECIFICATION

Measured gas	Carbon dioxide (CO ₂)
Operating Principle	Non-dispersive infrared (NDIR)
Measurement range CO ₂	0–5000ppm, 0–3%
OUT1 Linear Output	0–10VDC = 0–5000ppm
OUT2 Linear Output	0–5VDC = 0–5000ppm
OUT3 Digital Output	On ≥800ppm, Off ≤700ppm
OUT4 Digital Output	On ≥1000ppm, Off ≤900ppm
Accuracy CO ₂	±30ppm ±3% of reading
Dimensions	51 x 57 x 14mm (L x W x H)
Life Expectancy	>3 years
Operation temperature range	0–50°C
Operation humidity range	0–95%RH (non-condensing)
Power supply	4.5–14VDC
Current consumption	70mA (Average)
Response time _{T90}	2 seconds @ 0,5 l/min tube gas flow
Warm-up time	1 min
Communication	I ² C, UART (Modbus protocol)

APPLICATIONS

CO₂ Engine® K30 FR is designed for simple integration into products that requires a fast update rate of CO₂ measurement.

The sensor can be used in a wide range of applications where fast changes need to be detected, such as gas leakage in food and pharmaceuticals packaging industry. Other uses are human occupancy detection and leakage detection in industry environments.

KEY BENEFITS

- Fast response time
- Individually calibrated
- Maintenance-free
- High quality
- Long term stability

General Performance:

Storage Temperature Range.....	-30—70°C, (no condensation) ¹
Sensor Life Expectancy	>3 years
Maintenance Interval.....	Maintenance free ²
Self-Diagnostics.....	Complete function-check of the sensor module
Operating Temperature Range	0—50°C
Operating Humidity Range.....	0—95%RH, (non condensing) ³

Electrical / Mechanical:

Power Input	4.5—14 VDC max rating, (without reverse polarity protection) stabilized to +-5% over load and line changes. Ripple voltage less than 100mV.
Dimensions.....	51 x 57 x 14mm (Length x Width x Height)

CO₂ Measurement:

Operating principle.....	Non-dispersive infrared (NDIR) waveguide technology with ABC (Automatic Baseline Correction)
Sampling Method.....	Diffusion
Response Time (T _{1/e}).....	<2s, diffusion time @ 0.5l/min tube gas flow
Measurement Range	0—5000ppm
Accuracy.....	±30ppm ±3% of reading ⁴

Outputs:

Linear

OUT1.....	0—10VDC = 0—5000ppm
OUT2.....	0—5VDC = 0—5000ppm
Electrical Characteristics.....	R _{OUT} <100Ω, R _{LOAD} >5kΩ, Power input >5,5V ⁵

Digital

OUT3.....	On ≥800ppm, Off ≤700ppm
OUT4.....	On ≥1000ppm, Off ≤900ppm

Note 1: SO₂ enriched environments excluded

Note 2: When using Senseair®'s ABC (Automatic Baseline Correction) algorithm. ABC is enabled in default configuration

Note 3: Sensors are 100% tested in production at 45°C / 85%RH / 1000ppm CO₂ for one hour.

For applications operating continuously in high humidity, contact Senseair® for further information.

Note 4: Accuracy is specified over operating temperature range at normal pressure 101.3kPa. Specification is referenced to certified calibration mixtures.

Uncertainty of calibration gas mixtures (±1% currently) is to be added to the specified accuracy for absolute measurements.

Note 5: For the buffered output OUT2 the maximum output voltage range equals power voltage input minus 0.5V