# Senseair K33 ICB 10%

Sensor Module for bio applications

Senseair K33 ICB 10% is targeted on bio applications with required measurement range 0 to up to 10%vol CO_2.

Senseair K33 ICB 10% can be supplied in diffusion modification OR without tube IN/OUT.

The module is as all other sensors from Senseair 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.

This platform is designed to be a low power OEM module for integration into host apparatus, such as battery operated products and sensors with radio transmitters. Any application where power consumption is important to keep at a minimum without sacrificing the performance.
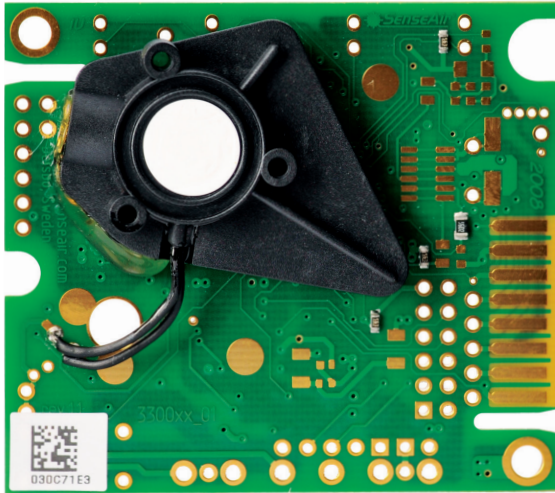
Standard specification

Measured gas	Carbon dioxide (CO_2)
Operating principle	Non-dispersive infrared (NDIR)
Measurement range	0 – 10%vol
Accuracy	±0.3%vol (CO_2) ±3% of measured value
Dimensions (L x W x H)	51 x 57 x 14 mm
Life expectancy	>15 years
Operation temp. range	0 – 50 °C
Operation humidity range	0 – 95% RH (non-condensing)
Power supply	5 – 14 V DC max rating, stabilised to within 10%
Power consumption	40 mA average <200 mA average during IR lamp ON (120 ms) <250 mA peak power during IR lamp start-up (the first 50 ms)
Communication	I²C, UART (Modbus protocol)

Key benefits

- Low-power consumption
- Individually calibrated
- Maintenance free
- High quality
- Long term stability

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Senseair K33 ICB 10% Technical Specification

General Performance:

Storage temperature range	-40 – 70 °C
Storage environment	Non-condensing, non-corrosive
Sensor life expectancy	>15 years
Maintenance interval	Maintenance-free [1]
Self-diagnostics	Complete function-check of the sensor module
Operating temperature range	0 – 50 °C
Operating humidity range	0 – 95% RH (non-condensing) [2]
Operating environment	Residential, commercial, industrial spaces used in HVAC (Heating Ventilation and Air-Conditioning) systems

Electrical / Mechanical:

Power input	5 – 14 V DC stabilised to within 10% (on board protection circuits) [2]
Average current consumption	40 mA average, <200 mA averaged during IR lamp ON, (120 ms)
Peak current consumption	<250 mA peak power (during IR lamp start-up, (the first 50 ms)
Electrical connections [3]	Terminals not mounted (G+, G0, OUT1,OUT2, Din1, Din2, TxD and RxD) [4]
Dimensions (Length x Width x Height)	51 x 57 x 14 mm

CO_2 Measurement:

Operating principle	Non-dispersive infrared (NDIR) waveguide technology with ABC (Automatic Baseline Correction)
Sampling method	Diffusion
Response time ($T_{1/e}$)	<20 s, diffusion or tube IN/OUT (0.2 l/minute gas flow)
Measurement period	2 seconds
Measurement range	0 – 10%$_{vol}$ (CO_2)
Accuracy	±0.3%$_{vol}$ (CO_2) ±3% of measured value [5]
Pressure dependence	+1.6% reading per kPa deviation from normal pressure, 101.3 kPa

Linear Signal Output:

OUT2

D/A resolution	5 mV
Linear conversion range	0 – 5 V DC for 0 – 10%$_{vol}$
Electrical characteristics	R_{OUT} <100 Ω, R_{LOAD} >5 kΩ, Power input >5.5 V [6]

Note 1: When using Senseair´s ABC (Automatic Baseline Correction) algorithm. ABC is enabled in default configuration.

Note 2: For applications operating continuously in high humidity, contact Senseair for further information.

Note 3: Notice that absolute maximum rating is 14 V, so sensor can be used with 12 V ±10% supply.

Note 4: Different options exist and can be customized depending on the application. Please contact Senseair for further information!

Note 5: Accuracy is specified over operating temperature range at normal pressure 101.3 kPa. 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 6: For the buffered output OUT2 the maximum output voltage range equals power voltage input minus 0.5 V.

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