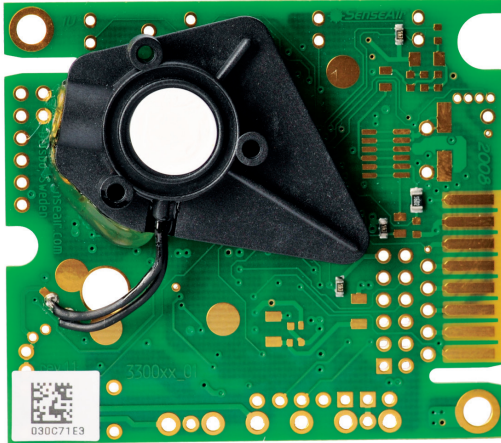


Senseair K33 BLG

Sensor module for environmental logging of CO₂ concentrations.



Senseair K33 BLG is a sensor module for measuring percentage-range carbon dioxide concentration, ambient temperature and relative humidity. It is very easy and small to integrate and operate. It works by either battery-operation or continuous-power. The measurement interval and logging frequency can both be configured to fit a required time resolution. All this result in adaptable and very low average power consumption to fit many requirements; both regarding long battery-operated life-time and low disturbing thermal output and self-heating.

Senseair K33 BLG can be used for low-power and battery applications. It has a large integrated memory for storing of the environmental parameters, also with timestamp. For continuous non-battery installations or when extracting data from memory, the sensor is equipped both with I²C factory edge-connector and with UART digital interface and communicate through Modbus.

Standard specification

Measured gas	Carbon dioxide (CO ₂)
Operating principle	Non-dispersive infrared (NDIR)
Measurement range CO ₂	0–30% vol.
Accuracy CO ₂	±(0.2% vol. +3% of measured value)
Measurement range Temp	-30–60°C
Accuracy Temp	±0.4
Measurement range RH	0–100%
Accuracy RH	±3%
Logging memory	5400 entries (14 Byte, 4 parameters)
Dimensions (L x W x H)	51 x 57 x 14mm
Life expectancy	>10 years
Power supply	4.75–12VDC max rating, via Vbat+
Stand-by current consumption	50µA
Maximum peak current	<250mA
Communication	I ² C, UART (Modbus protocol)

Key benefits

- Triple environmental sensing; CO₂, Temp and RH
- Configurable sampling and measurement periods
- Logger functionality (Time, CO₂, Temperature, RH)
- Configurable logging resolution, minutes to months
- Low-power consumption by stand-by mode
- Maintenance-free operation
- Calibrated and specified measurement accuracy over wide environmental conditions



Senseair K33 BLG Technical Specification

General Performance:

Storage temperature range	-40–70°C
Storage Environment	Non-corrosive, non-condensing ¹
Sensor life expectancy	>10 years
Maintenance Interval	Maintenance-free ²
Self-diagnostics	Complete function-check of the sensor module

Operating environment required for keeping calibrated and specified accuracy in gas measurement:

Operating temperature range	0–50°C
Operating humidity range	0–95%RH (non-condensing) ³

Electrical Properties:

Power input	4.75–12.0 VDC max rating, powered via Vbat+ ^{3,4} 5.50–12.0 VDC maximum rating, powered via G+ ^{3,5}
Stand-by current consumption	~50µA average during low-power stand-by mode
Measuring current consumption	~60mA average during a complete measurement sequence (~12 seconds)
Peak current consumption	<150mA average current draw (during IR emitter irradiation, 100 milliseconds) <250mA peak current (during cold IR emitter start-up, the first 50 milliseconds)

Mechanical Properties:

Electrical connections	Vbat+, G+ and G0
Dimensions	51 x 57 x 14mm (Length x Width x Height)

CO₂ Measurement:

Operating principle	Non-dispersive infrared (NDIR)
Diffusion sampling method	Open diffusion through hydrophobic and oleophobic filter
Diffusion response Time (T1/e)	<25s for gas diffusion exchange to reach a ~63% step response <3 min, 30s measurement period, frac filter enabled
Measurement range	0–30%vol.
Accuracy	± (0.2%vol. CO ₂ +3% of measured value) ⁶
Pressure dependence	+1.6% reading per kPa deviation from normal pressure, 101.3kPa
Digital resolution	0.001%vol.
Measurement interval	Configurable interval range from once per 5 minutes to once per 6 months

Temperature Measurement:

Operating principle	Silicon bandgap temperature sensor
Measurement range	-30–60°C
Accuracy	±0.4°C @ 25°C ^{7,8}
Measurement interval	>5min

Relative Humidity Measurement:

Operating principle	Capacitive sensor element
Measurement range	0–100%RH (non-condensing environment)
Accuracy	±3%RH ^{7,8}
Measurement interval	>5 min

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 12V, so sensor can not be used with 12V±10% supply.

Note 4: Unprotected against reverse connection!

Note 5: Power supply via protection circuit

Note 6: 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 7: Specification is provided by Sensirion.

Note 8: Accuracy is defined after minimum five (5) minutes measurement period.