

## **Model : K33-ICB2** *CO<sub>2</sub> Sensor module* *Designed for Incubator Applications*



Figure 1. **K33-ICB2 with pig-tail connections**

**K33-ICB2** is a non-dispersive infra-red (NDIR) CO<sub>2</sub> sensor module designed specifically for incubator application. With pigtail wire connections, the **K33-ICB2** comes with internal and external mounting options.

The sensor module is powered with 12V DC and it converts the measurement into a linear voltage signal; 0 – 5V corresponding to 0 – 20 vol. % CO<sub>2</sub>.

The **K33-ICB2** also comes with simple maintenance features. The BC wiring connection allows the user to perform a quick background calibration (BC) [sensor exposed to the fresh-air condition.]

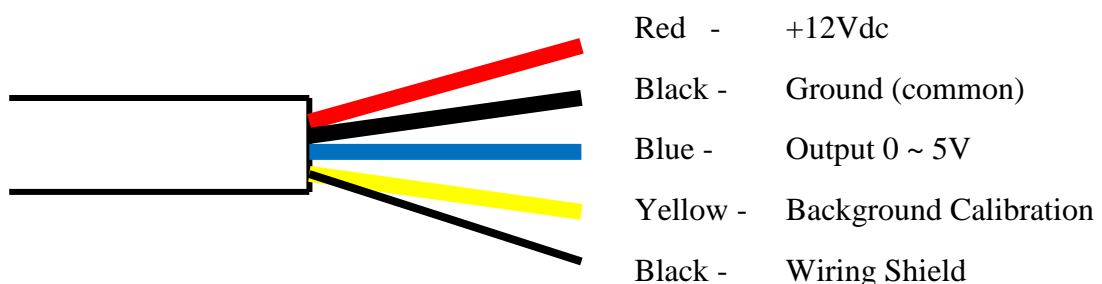


Figure 2. **K33-ICB2 Wiring Connections**

# K33-ICB22 - Technical specification

## General Performance:

Storage Temperature Range	..... -40 to +70 °C (no condensation environment)
Sensor Life Expectancy	..... > 15 years <sup>2</sup>
Maintenance Interval	..... every 12 months
Self-Diagnostics	..... complete function check of the sensor module
Warm-up Time	..... ≤ 1 min
Conformance with the standards.....	Emission: EN61000-6-3:2001 Immunity: EN61000-6-2:2001 RoHS directive 2002/95/EG
Conformance with standards.....	Mechanical shock test IEC 60068-2-27 Test Ea .....Random vibration test IEC 60068-2-64 Test Fh
Vibration immunity Test severity	..... IEC TR 60721-4-5 table 5: IEC 60721-3-5, Class 5M3 (3,6 gRMS) "Mechanical conditions in road vehicles in areas without well-developed road systems, light-weighted vehicles, tracked vehicles and self propelled machines, including installations in places which may be directly hit by flying stones"
Random vibration Test severity	..... IEC TR 60721-4-2 table 7: IEC 60721-3-2, Class 2M3 (3,2 gRMS) "Transportation in lorries, trailers and all other kinds of transportation in areas without well-developed road systems, by trains with shock reducing buffers and by ships", ..... IEC 60721-3-2, Class A (1,0 gRMS) "Instrumentation and automation equipment on ships"
Operating Temperature Range	..... -10 to 50 °C
Operating Humidity Range	..... 0 to 95% RH (non-condensing)
Operating Environment	..... Incubators and/or Residential, commercial and industrial spaces. <sup>4</sup>
Certification	..... CE certification pending

## Electrical / Mechanical:

Power Input	..... 9 - 18 VDC max rating, stabilized to within 10% (on board protection circuits) <sup>3</sup>
Current Consumption	..... 40 mA average < 150 mA peak current (averaged during IR lamp ON, 120 msec) < 250 mA peak power (during IR lamp start-up, the first 50 msec)
Electrical Connections	..... 4 x AWG24 cable for power input (Red, Black) and voltage outputs (Blue) and background calibration (Yellow), wire length ≈ 96cm <sup>4</sup>
Dimensions	..... 8 x 6 x 3 cm (Length x Width x approximate Height); external dimensions

## CO<sub>2</sub> Measurement: <sup>4</sup>

Sensing Method	..... non-dispersive infrared (NDIR) waveguide technology
Sampling Method	..... diffusion
Response Time (T <sub>1/e</sub> )	..... 30 sec diffusion time
Measurement Range	..... 0 to 20% <sub>vol.</sub>
Repeatability	..... ± 0.1 %vol. CO <sub>2</sub> ± 2 % of measured value <sup>1,5</sup>
Accuracy	..... ± 0.2 %vol. CO <sub>2</sub> ± 3 % of measured value
Pressure Dependence	..... + 1.6 % reading per kPa deviation from normal pressure, 100 kPa
Calibration support	..... BC input to trigger Background Calibration @ 400 ppm (0.04% <sub>vol.</sub> ) CO <sub>2</sub> (short circuit to G0 for at least 5 sec)

## Outputs: <sup>4</sup>

Voltage output	..... 0 – 5V corresponding to 0 – 20 vol.% CO <sub>2</sub>
Output voltage resolution	..... 5mV or 0.03% CO <sub>2</sub>
Output Load	..... ≥ 10 kohm

Note 1: In normal IAQ applications. Accuracy is defined after minimum 3 weeks of continuous operation. However, some industrial applications do require maintenance. Please, contact SenseAir for further information!

Note 2: SO<sub>2</sub> enriched environments are excluded.

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

Note 4: Different options exist and can be customized depending on the application. Please, find possible options in this document and contact SenseAir for further information!

Note 5: Accuracy is specified over operating temperature range. Specification is referenced to certified calibration mixtures. Uncertainty of calibration gas mixtures (+-2% currently) is to be added to the specified accuracy for absolute measurements.

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