

Go for cost-effective and straightforward CO₂ measurement

Flow-through measurement module for high CO₂ concentrations

The Vaisala CARBOCAP® Carbon Dioxide Module GMM111 is for light industrial applications requiring cost-effective and straightforward CO₂ measurement.



As an alternative to diffusion aspirated CO₂ probes, Vaisala's range of carbon dioxide instruments for high CO₂ concentrations is expanding with the Vaisala CARBOCAP® Carbon Dioxide Module GMM111.

The GMM111 is a compact CO₂ module with flow-through aspiration. The module is available with measurement ranges of 0...5% CO₂, 0...10% CO₂, or 0...20% CO₂. It is particularly well-suited for measurements in pharmaceutical incubators, bioreactors and chicken egg hatchers.

Light industrial applications

The GMM111 expands Vaisala's range of CO₂ products for light industrial applications. The success of the diffusion aspirated GMP221 probes for high concentrations has spurred us to develop a flow-through aspirated module. The module is intended for light industrial applications requiring cost-effective and straightforward CO₂ measurement for percentage level CO₂ concentrations.

Flow-through sampling

The flow-through sampling concept of the GMM111 is realized with the well-established Vaisala CARBOCAP®, a

silicon-based non-dispersive infrared (NDIR) sensor. The measurement is made with an advanced single-beam, dual wavelength technology with no moving parts. The excellent long-term stability is a result of both the CARBOCAP® technology and the corrosion resistance and tolerance of high humidity of the sensor structure. The measurement is made with renowned Vaisala accuracy - including repeatability, non-linearity, and calibration uncertainty, the accuracy is +/- 0.3% CO₂ and 3% of reading - which caters for the needs of demanding applications.

Benefiting original equipment manufacturers

The target applications for this module are mainly original equipment manufacturers (OEM) requiring a compact and cost-effective CO₂ measurement module. Bioreactor users, pharmaceutical incubator manufacturers, chicken egg hatcher producers, and other OEM manufacturers will benefit from this flow-through design.

The module can be easily integrated into any design and features both 4...20 mA and 0...10V analog outputs. Serial communication using a 2-wire RS485 connection enables several instruments

to be installed using a single connection bus. For gas sampling, an inlet and an outlet is provided with convenient gas sampling tube fittings.

The GMM111 sensor is designed to minimize the number of particles reaching the optical cell of the sensor. Although all flow-through sampling instruments require some amount of sample conditioning, the design which prevents particles from reaching the sampling cell also prevents pressure building inside the cell. The effect of gas flow on the CO₂ reading is negligible at rates below 1 liter per minute, but allows for free flow rates up to even 10 liters per minute.

However, precaution must be taken when drawing air from humid environments, since the sensor inside the flow-through cell must still be protected from condensation. Pharmaceutical incubators and other environmental chambers in particular tend to be demanding measurement applications, since a gas sample is usually drawn from an environment with high temperature and humidity. The GMM111 offers a flow-through sampling option for these applications requiring an accurate CO₂ measurement in harsh and humid environments.