

## GMM111 Carbon Dioxide Module



The Vaisala CARBOCAP® Carbon Dioxide Module GMM111 is a CO<sub>2</sub> measurement module with flow-through aspiration.

### Features/Benefits

- Compact CO<sub>2</sub> module with flow-through aspiration
- Ideal for control of CO<sub>2</sub> concentrations in incubators
- Incorporates Vaisala CARBOCAP®, the silicon based NDIR sensor with unique internal referencing
- Advanced single-beam, dual wavelength measurement with no moving parts
- Measurement range options 0 ... 5 %, 0 ... 10 % and 0 ... 20 % CO<sub>2</sub>
- Excellent long-term stability

The Vaisala CARBOCAP® Carbon Dioxide Module GMM111 is designed especially for control of biological processes where high CO<sub>2</sub> concentrations are used. It has 3 optional measurement ranges 0 ... 5/10/20 % CO<sub>2</sub>. The GMM111 is a flow-through model and has barbed connectors for attaching the in and out flow tubes. As the module is not mounted in the chamber, the chamber can be heatsterilized without removing the module.

The Vaisala CARBOCAP® CO<sub>2</sub> sensors have been proven to be accurate and durable. They have an excellent long-term stability, which decreases maintenance. The superior performance of Vaisala CARBOCAP® sensors results largely

from the stable reference provided by the electrically tunable Fabry-Perot Interferometer(FPI).

The tunable FPI filter measures CO<sub>2</sub> absorption, and simultaneously a reference wavelength. This internal reference measurement compensates effectively for any changes in the optical path, such as light source intensity changes and contamination. In the HVAC market, this type of reference measurement is a unique feature to Vaisala CARBOCAP® products.

The true internal reference measurement of Vaisala CARBOCAP® CO<sub>2</sub> transmitters provides years of stable CO<sub>2</sub> measurements.

# Technical Data

## Performance

CO <sub>2</sub> measurement range	0 ... 5 %, 0 ... 10 % or 0 ... 20 %
Accuracy (including repeatability, non-linearity and calibration uncertainty)	±(1.5% of range + 3 % of reading)
Long-term stability	
0 ... 8 %CO <sub>2</sub>	±0.5 %CO <sub>2</sub> /year
8 ... 12 %CO <sub>2</sub>	±1 %CO <sub>2</sub> /year
12 ... 20 %CO <sub>2</sub>	±2 %CO <sub>2</sub> /year
Response time T <sub>90</sub>	< 1 min, when flow > 0.2 l/min
Flow rate dependence	
< 1 l/min flow	no effect
1 ... 10 l/min flow	4 % of reading/ l/min
Temperature dependence, typical	-0.3 % of reading/°C
Pressure dependence, typical	+0.15 % of reading/hPa
Warm-up time	1 min, 10 min for full specifications

## Operating Environment

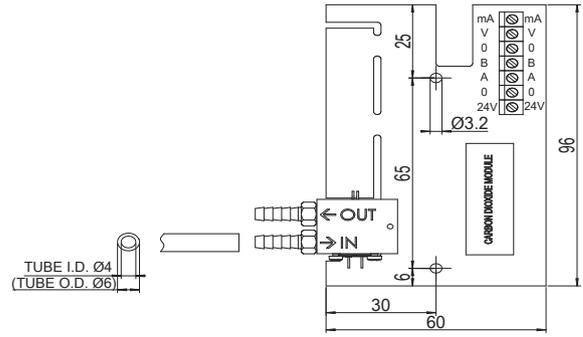
Temperature	+5 ... +55 °C (+41 ... +131 °F)
Humidity	0 ... 99 %RH non-condensing
Pressure	700 ... 1200 hPa
Gas flow	
operating range	< 10 l/min
recommended range	0.2 ... 0.8 l/min
Electromagnetic compatibility	Applicable parts of EN61326-1, Generic Environment

## Inputs and Outputs

Outputs	4 ... 20 mA, 0 ... 10 V RS485, 2-wire, non-isolated
Operating voltage	24 V (±20 %) AC/DC
Power consumption	<2 W

## Dimensions

Dimensions in mm



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