

## GMP251 Carbon Dioxide Probe for %-Level Measurements



The GMP251 is shown in the actual size in the above image.

The Vaisala CARBOCAP® Carbon Dioxide Probe GMP251 is a new intelligent probe for measuring carbon dioxide. This robust, stand-alone measurement device is designed for use in demanding applications, like life science incubators, where stable, reliable, and accurate performance is required. The GMP251 is based on Vaisala's unique, second-generation CARBOCAP® technology that enables exceptional stability. A new type of infrared (IR) light source is used instead of the traditional incandescent light bulb, which extends the lifetime of the GMP251. The GMP251 incorporates an internal temperature sensor for compensation of the CO<sub>2</sub> measurement according

to ambient temperature. The effects of pressure and background gas can also be compensated for. The measurement range is 0 ... 20 %CO<sub>2</sub> and the sensor performance is optimized at 5 %CO<sub>2</sub> measurement. The operating temperature range of the probe is wide and the probe housing is classified as IP65. Condensation is prevented as the internal sensor head is heated. The GMP251 is resistant to dust and most chemicals, such as, H<sub>2</sub>O<sub>2</sub> and alcohol-based cleaning agents.

### Ease of Use

The GMP251 is a compact probe that is easy and fast to install in a number of ways. It's easy to plug in and plug out. The surface of the

### Features/Benefits

- Measurement range  
0 ... 20 %CO<sub>2</sub>
- Intelligent, stand-alone probe with analog (V, mA) and digital (RS485) outputs
- Superior long-term stability with the 2nd-gen proprietary CARBOCAP® technology
- Wide operating temperature range -40 ... +60 °C
- IP65 classified housing
- Full temperature and pressure compensations
- Integrated temperature measurement for CO<sub>2</sub> compensation purposes
- Compensations for background gases, O<sub>2</sub>, and humidity
- Sensor head heated to prevent condensation
- Applications: life science incubators, cold storages, fruit and vegetable transportation

probe is smooth, which makes it easy to clean. The probe provides several outputs for the CO<sub>2</sub> measurement, analog current and voltage outputs as well as digital RS485 with Modbus protocol.

### Applications

The GMP251 is ideal for life science incubators, cold storages, fruit and vegetable transportation, and for all demanding applications where stable and accurate %-level CO<sub>2</sub> measurements are needed.

# Technical Data

## Performance

Measurement range	0 ... 20 %CO <sub>2</sub>
Accuracy (including repeatability and non-linearity) at 25 °C and 1013 hPa	
at 5 %CO <sub>2</sub>	±0.1 %CO <sub>2</sub>
0 ... 8 %CO <sub>2</sub>	±0.2 %CO <sub>2</sub>
8 ... 20 %CO <sub>2</sub>	±0.4 %CO <sub>2</sub>
Calibration uncertainty	
at 5 %CO <sub>2</sub>	±0.05 %CO <sub>2</sub>
at 20 %CO <sub>2</sub>	±0.19 %CO <sub>2</sub>
Long-term stability	
0 ... 8%CO <sub>2</sub>	±0.3 %CO <sub>2</sub> / year
8 % ... 12%CO <sub>2</sub>	±0.5 %CO <sub>2</sub> / year
12 % ... 20%CO <sub>2</sub>	±1.0 %CO <sub>2</sub> / year
Temperature dependence with compensation	
at 5 %CO <sub>2</sub> , 0 ... 50 °C	<±0.05 %CO <sub>2</sub>
Pressure dependence with compensation	
at 5 %CO <sub>2</sub> , 700 ... 1100 hPa	±0.05 %CO <sub>2</sub>
Start-up time at 25 °C	< 10 s
Warm-up time (for full specifications)	< 4 min
Response time (T90) with standard filter	< 1 min
FLOW-THROUGH MODEL/OPTION	
Response time (T90) with >0.1 l/min	< 1 min
Flow rate dependence	
<1 l/min flow	no effect
1 ... 10 l/min	< 0.6 % of reading/ l/min
Gas flow	
Operating range	< 10 l/min
Recommended range	0.1 ... 0.8 l/min

## Operating Environment

Operating temperature	-40 ... +60 °C
Storage temperature	-40 ... +70 °C
Pressure (compensated)	500 ... 1200 hPa
operating	< 1.5 bar
Humidity	0 ... 100 %, non-condensing
Condensation prevention	sensor head heating when power is on
Chemical tolerance (temporary exposure during cleaning)	H <sub>2</sub> O <sub>2</sub> (2000 ppm) non-condensing; alcohol-based cleaning agents (e.g. ethanol and IPA); acetone; acetic acid
Electromagnetic compatibility	EN61326-1, Generic Environment

## Inputs and Outputs

Operating voltage	
when digital output in use	12 ... 30VDC
when voltage output in use	13 ... 30VDC
when current output in use	20 ... 30VDC
Digital output	RS485 (Modbus RTU, Vaisala Protocol)
Analog outputs	0 ... 5/10 V (scalable), min. load 10 kΩ 0/4 ... 20 mA (scalable), max. load 500 Ω
Power consumption	0.4 W in continuous operation

## Mechanics

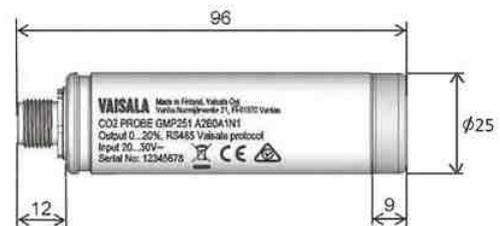
Probe housing material	PET plastic
Filter material	PTFE membrane, PET plastic grid
Connector	Nickel plated brass, M12 / 5 pin
Housing classification	IP65
Weight	
probe	45 g

## Spare Parts and Accessories

Standard membrane filter	ASM211650SP
Porous sintered PTFE filter, extra protection	DRW243649SP
Flow-through adapter with gas ports	ASM211697SP
Probe cable with open wires (1.5 m)	223263SP
Probe cable with open wires and 90° plug (0.6 m)	244669SP
Probe cable with open wires (10 m)	216546SP
Probe mounting clips (2 pcs)	243257SP
Probe mounting flange	243261SP
USB cable for PC connection	242659
MI70 connection cable for probe	CBL210472
Calibration adapter	DRW244827SP

## Dimensions

Probe diameter	25 mm
Dimensions in mm	



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