VAISALA

GMP252 Carbon Dioxide Probe
For ppm-level measurements

Vaisala CARBOCAP® Carbon Dioxide Probe GMP252 is a new intelligent probe for measuring carbon dioxide. This robust, stand-alone measurement device is designed for use in agriculture, refrigeration, greenhouses, and demanding HVAC applications.

Benefits

- Superior long-term stability
- Reliable and accurate
- Calibration certificate included

GMP252 is suitable for harsh and humid CO$_2$ measurement environments where stable and accurate ppm-level CO$_2$ measurements are needed. GMP252 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 GMP252.

GMP252 incorporates an internal temperature sensor for compensation of the CO$_2$ measurement according to ambient temperature. The effects of pressure and background gas can also be compensated for. The measurement range is 0 ... 10 000 ppmCO$_2$ (measurements up to 30 000 ppmCO$_2$ are available with reduced accuracy). The operating temperature range of the probe is wide (-40 ... +60 °C (-40 ... +140 °F)), and the probe housing is classified as IP65. Condensation is prevented as the internal sensor head is heated.

GMP252 is resistant to dust and most chemicals, such as, H$_2$O$_2$ and alcohol-based cleaning agents.

Ease of use

GMP252 is a compact probe with easy and fast plug-in, plug-out installation. The surface of the probe is smooth, which makes it easy to clean. The probe provides several output options, including analog current and voltage outputs and digital RS-485 output with Modbus protocol.

GMP252 can be connected to Indigo series transmitters for an extended selection of outputs and configuration options. See www.vaisala.com/indigo.

For easy-to-use access to field calibration, device analytics, and configuration functionality, the probe can be connected to Vaisala Insight PC software. See www.vaisala.com/insight.

Applications

GMP252 is ideal for agriculture, refrigeration, greenhouses, and demanding HVAC applications where stable and accurate ppm-level CO$_2$ measurements are needed.

Technical data

Measurement performance

Measurement range	0 ... 10 000 ppmCO_2 (up to 30 000 ppmCO_2 with reduced accuracy)
Accuracy at 25 °C and 1013 hPa (incl. repeatability and non-linearity)	
0 ... 3000 ppmCO_2	±40 ppmCO_2
3000 ... 10 000 ppmCO_2	±2 % of reading
Up to 30 000 ppmCO_2	±3.5 % of reading
Calibration uncertainty	
at 2000 ppmCO_2	±38 ppmCO_2
at 10 000 ppmCO_2	±105 ppmCO_2
Long-term stability	
0 ... 3000 ppmCO_2	±60 ppmCO_2/year
3000 ... 6000 ppmCO_2	±150 ppmCO_2/year
6000 ... 10 000 ppmCO_2	±300 ppmCO_2/year
Temperature dependence 0 ... 10 000 ppmCO_2	
with compensation, -10 ... +50 °C	±0.05 % of reading/°C
with compensation, -40 ... +60 °C	< ±0.1 % of reading/°C
without temperature compensation at 2000 ppmCO_2 (typical)	-0.5 % of reading/°C
Pressure dependence	
with compensation at 0 ... 10 000 ppmCO_2, 500 ... 1100 hPa	±0.015 % of reading/hPa
without compensation (typical)	+0.15 % of reading/hPa
Humidity dependence	
with compensation, 0 ... 10 000 ppmCO_2, 0 ... 100 %RH	±0.7 % of reading (at +25 °C (+77 °F))
without compensation (typical)	+0.05 % of reading/%RH
O_2 dependence	
with compensation, 0 ... 10 000 ppm %CO_2, 0 ... 90 %O_2	±0.6 % of reading (at +25 °C (+77 °F))
without compensation (typical)	-0.08 % of reading/%O_2
Start-up, warm-up and response time	
Start-up time at +25 °C	< 12 s
Warm-up time for full spec.	< 2 min
Response time (T90) with standard filter	< 1 min
Response time (T90) with spray shield	< 3 min
Flow-through option	
Response time (T90) with > 0.1 l/min	30 s
Flow rate dependence < 1 l/min flow	no effect
Flow rate dependence 1 ... 10 l/min flow	< 0.6 % of reading l/min
Gas flow operating range	< 10 l/min
Gas flow recommended range	0.1 ... 0.8 l/min

Operating environment

Operating temperature of CO_2 measurement	-40 ... +60 °C (-40 ... +140 °F)
Storage temperature	-40 ... +70 °C (-40 ... +158 °F)
Humidity	0 ... 100 %RH, non-condensing
Condensation prevention	Sensor head heating when power on
EMC compliance	EN61326-1, Generic environment
Chemical tolerance (temporary exposure during cleaning)	• H_2O_2 (2000 ppm, non-condensing) • Alcohol-based cleaning agents (for example ethanol and IPA) • Acetone • Acetic acid
Pressure	
Compensated	500 ... 1100 hPa
Operating	< 1.5 bar

Mechanical specifications

Weight, probe	58 g (2.05 oz)
Connector type	M12 5-pin male
IP rating, probe body	IP65
Materials	
Probe housing material	PBT polymer
Filter	PTFE
Connector	Nickel plated brass
Dimensions	
Probe diameter	25 mm (0.98 in)
Probe length	130 mm (5.12 in)
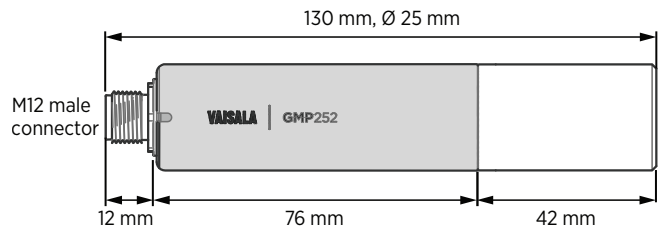
Inputs and outputs

Digital output	Over RS-485: • Modbus • Vaisala Industrial Protocol
Analog output	• 0 ... 5/10 V (scalable), min load 10 kΩ • 0/4 ... 20 mA (scalable), max load 500 Ω
Operating voltage	
With digital output in use	12 ... 30 VDC
With voltage output in use	12 ... 30 VDC
With current output in use	20 ... 30 VDC
Power consumption	
Typical (continuous operation)	0.4 W
Maximum	0.5 W
When connected to Indigo 200 transmitter	
Analog output	3 voltage (V) or current (mA) outputs: • 0 ... 10 VDC / 0 ... 5 VDC / 0 ... 1 VDC / 1 ... 5 VDC (min load 1kΩ) • 0 ... 20 mA / 4 ... 20 mA (max load 500 Ω)
Relays	2 configurable relays
Power supply input	Nominal 24 V, range: • 15 ... 40 VDC • 20 ... 28 VAC
Power consumption	Max. 3.5 W (transmitter + probe total max. consumption)

Spare parts and accessories

Porous sintered PTFE filter for GMP252	DRW244221SP
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
Flow-through adapter with gas ports	ASM212011SP
USB cable for PC connection [1]	242659
MI70 connection cable for probe	CBL210472
Flat cable for GMP250 probes, M12 5-pin	CBL210493SP
Probe mounting clips (2 pcs)	243257SP
Probe mounting flange	243261SP
Calibration adapter	DRW244827SP
Spray shield	ASM212017SP
Radiation shield DTR250	DTR250
Radiation shield DTR250 with pole mounting kit	DTR250A

1) *Vaisala Insight software for Windows available at www.vaisala.com/insight*

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