VAISALA

GMP252 Carbon Dioxide Probe
For ppm-level measurements

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

Benefits

- Excellent 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 patented, latest-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 ppm CO_2 (measurements up to 30 000 ppm CO_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_2O_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 and the Indigo80 handheld indicator for an extended range of outputs and configuration options.

For easy-to-use access to field calibration, device analytics, and configuration functionality, the probe can be connected to Vaisala Insight software for Windows®.

Applications

GMP252 is ideal for agriculture, refrigeration, greenhouses, and demanding HVAC applications where stable and accurate ppm-level CO_2 measurements are needed.

A flow-through adapter with gas ports is available as an accessory, enabling tubing for easy and flexible remote measurement with a separate pump. A multiplexer can also be added for sampling gas from several locations. [1]

1) Third-party pump and multiplexer not provided by Vaisala.

Technical data

Measurement performance

Measurement range	0 ... 10 000 ppm CO_2
	(up to 30 000 ppm CO_2 with reduced accuracy)
Accuracy [1]	
0 ... 3000 ppm CO_2	±40 ppm CO_2
3000 ... 10 000 ppm CO_2	±2 % of reading
Up to 30 000 ppm CO_2	±3.5 % of reading
Calibration uncertainty	
at 2000 ppm CO_2	±31 ppm CO_2
at 10 000 ppm CO_2	±105 ppm CO_2
Long-term stability	
0 ... 3000 ppm CO_2	±60 ppm CO_2/year
3000 ... 6000 ppm CO_2	±150 ppm CO_2/year
6000 ... 10 000 ppm CO_2	±300 ppm CO_2/year
Temperature dependence 0 ... 10 000 ppm CO_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 ppm CO_2 (typical)	−0.5 % of reading/°C
Pressure dependence	
With compensation at 0 ... 10 000 ppm CO_2, 500 ... 1100 hPa	±0.015 % of reading/hPa
Without compensation (typical)	+0.15 % of reading/hPa
Humidity dependence	
With compensation, 0 ... 10 000 ppm CO_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
Flow-through option with > 0.1 l/min	30 s
With spray shield	< 3 min
Flow rate dependence (for flow-through option)	
< 1 l/min flow	no effect
1 ... 10 l/min flow	< 0.6 % of reading l/min

1) At 25 °C and 1013 hPa (incl. repeatability and non-linearity).

Inputs and outputs

Analog outputs	• 0 ... 5/10 V (scalable), min. load 10 kΩ
	• 0/4 ... 20 mA (scalable), max. load 500 Ω
Digital output	Over RS-485:
	• Modbus
	• Vaisala Industrial Protocol
Operating voltage	
With digital output in use	12 ... 30 V DC
With voltage output in use	12 ... 30 V DC
With current output in use	20 ... 30 V DC
Power consumption	
Typical (continuous operation)	0.4 W
Maximum	0.5 W

## 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
IP rating, probe body	IP65
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
Gas flow (for flow-through option)	
Operating range	< 10 l/min
Recommended range	0.1 ... 0.8 l/min

## Compliance

EU directives and regulations	EMC, RoHS
EMC compatibility	EN 61326-1, basic electromagnetic environment
EMC emissions	CISPR 32 / EN 55032, Class B
Compliance marks	CE, RCM

Mechanical specifications

Weight, probe	58 g (2.05 oz)
Connector type	M12 5-pin male
Materials	
Probe housing	PBT polymer
Filter	PTFE
Connector	Nickel plated brass
Dimensions	
Probe diameter	25 mm (0.98 in)
Probe length	130 mm (5.12 in)
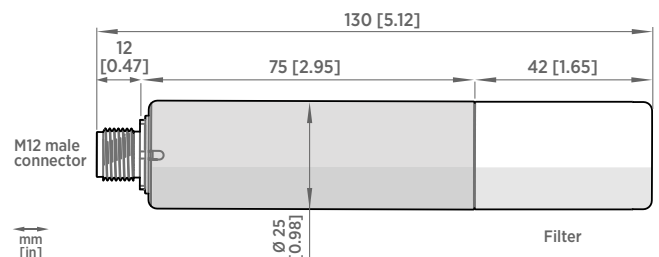
GMP252 probe dimensions
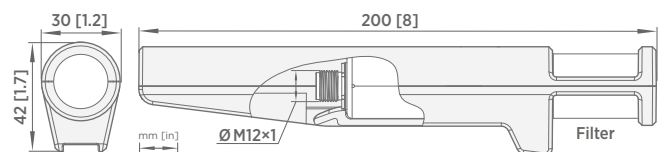
GMP252 probe handle dimensions

Spare parts and accessories

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Porous sintered PTFE filter for GMP252	DRW244221SP
Probe connection cable with open wires (1.5 m)	223263SP
Probe connection cable with open wires (1.5 m), shielded	254294SP
Probe connection cable with open wires (3 m)	26719SP
Probe connection cable with open wires (10 m)	216546SP
Probe connection cable with open wires and 90° plug (0.6 m)	244669SP
Probe connection cable with open wires and 90° plug (1.5 m)	255102
MI70 connection cable, M12 5-pin	CBL210472
Flat cable for GMP250 probes, M12 5-pin	CBL210493SP
Indigo USB adapter [1]	USB2
Probe mounting clips (2 pcs)	243257SP
Probe mounting flange	243261SP
Probe holder assembly	ASM213582
Probe handle with magnetic hanger	GMP252HANDLESP
Flow-through adapter with gas ports	ASM212011SP
Calibration adapter	DRW244827SP
Spray shield	ASM212017SP
Radiation shield DTR250	DTR250
Radiation shield DTR250 with pole mounting kit	DTR250A

1) *Vaisala Insight software for Windows*
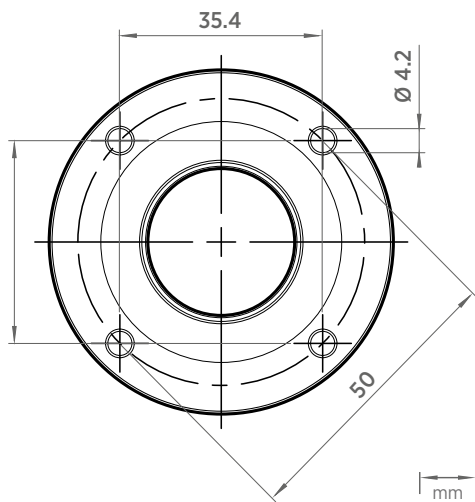
Probe mounting flange 243261SP dimensions
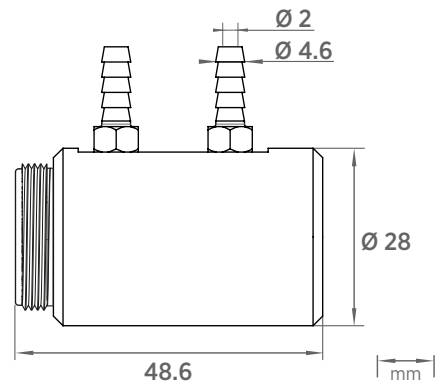
Flow-through adapter with gas ports ASM212011SP. Suitable for tubes with 4 mm inner diameter.
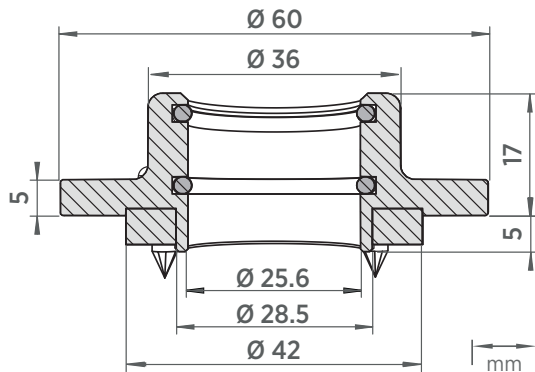
Probe mounting flange 243261SP dimensions, cross section
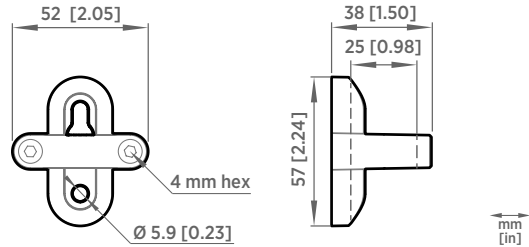
Probe holder ASM213582 dimensions