



VAISALA

GMP343 Carbon Dioxide Probe

For demanding measurements



Features

- Vaisala CARBOCAP® sensor, a silicon-based non-dispersive infrared (NDIR) sensor
- Single-beam, dual wavelength CO₂ measurement with no moving parts
- Compensation options for temperature, pressure, humidity, and oxygen
- Designed for outdoor use

Vaisala CARBOCAP® Carbon Dioxide Probe GMP343 is an accurate and rugged probe-type instrument for ecological measurements. Typical applications include CO₂ soil respiration, ambient CO₂ monitoring, plant growth chambers, and OEM applications.

Benefits

- Low power consumption and heat emission
- Compact and lightweight
- Excellent accuracy and stability

GMP343 can output both numerically filtered and raw measurement data, and it can also compensate the measurement with an internal temperature measurement and user-set relative humidity, pressure, and oxygen values.

In combination with an MI70 indicator, GMP343 provides a tool for accurate in-situ measurement. MI70 can be used as a display, communication, and data logging device.

Each GMP343 is calibrated using $\pm 0.5\%$ accurate gases at 0 ppm, 200 ppm, 370 ppm, 600 ppm, 1000 ppm, 4000 ppm, and 2 %. Calibration is also done at temperature points of $-30\text{ }^{\circ}\text{C}$ ($-22\text{ }^{\circ}\text{F}$), $0\text{ }^{\circ}\text{C}$ ($32\text{ }^{\circ}\text{F}$), $25\text{ }^{\circ}\text{C}$ ($77\text{ }^{\circ}\text{F}$), and $50\text{ }^{\circ}\text{C}$ ($122\text{ }^{\circ}\text{F}$).

If needed, the customer can recalibrate the instrument using the multipoint calibration (MPC) feature allowing up to 8 user-defined calibration points.



Technical data

Measurement performance

Measurement range options 0 ... 1000 ppm, 0 ... 2000 ppm,
0 ... 3000 ppm, 0 ... 4000 ppm,
0 ... 5000 ppm, 0 ... 2 %

Accuracy (excluding noise) at 25 °C (77 °F) and 1013 hPa after factory calibration with 0.5 % accurate gases with different range options

0 ... 1000 ppm $\pm(3 \text{ ppm} + 1 \% \text{ of reading})$

0 ... 2000 ppm - 0 ... 2 %¹⁾ $\pm(5 \text{ ppm} + 2 \% \text{ of reading})$

Noise (repeatability) at 370 ppmCO₂

With no output averaging $\pm 3 \text{ ppmCO}_2$

With 30 s output averaging $\pm 1 \text{ ppmCO}_2$

Long-term stability (see graph 'GMP343 operating conditions')

Easy $\pm 2 \% \text{ of reading}^{2)/} \text{ year}$

Moderate $\pm 2 \% \text{ of reading}^{2)/} \text{ 6 months}$

Harsh $\pm 2 \% \text{ of reading}^{2)/} \text{ 3 months}$

Warm-up time

To full accuracy $\pm 0.5 \%$ 10 min

To full accuracy 30 min

¹⁾ Accuracy below 200 ppmCO₂ not specified for 2 % range option.

²⁾ Always at least $\pm 10 \text{ ppmCO}_2$.

Effect on accuracy with temperature compensation

CO₂ range options 0 ... 1000 ppm 0 ... 2 000 - 5000 ppm 0 ... 2 %

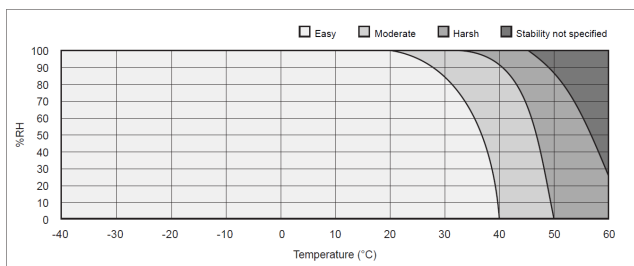
Temperature °C (°F) Accuracy (% of reading)¹⁾

+10 ... +40
(+50 ... +104) ± 1 ± 1 ± 2

+40 ... +60
(+104 ... +140) ± 2 ± 3 ± 4

-40 ... +10
(-40 ... +50) ± 3 ± 3 ± 5

¹⁾ Always at least $\pm 10 \text{ ppmCO}_2$.
Temperature compensation is performed by an integrated Pt1000 element.



GMP343 operating conditions

Effect on accuracy with pressure compensation

CO₂ range options 0 ... 1000 ppm 0 ... 2000 - 2 %

Pressure (hPa) Accuracy (% of reading)

900 ... 1050 ± 0.5 ± 1

700 ... 1300 ± 1 ± 2

Integrated pressure sensor **not** included in GMP343.

Response time (90 %)

Diffusion model

Filter attached	Averaging (s)	Response (s)
Yes	0	75
Yes	30	82
No	0	4
No	30	30

Flow-through model

Gas flow (l/min)	Averaging (s)	Response (s)
0.3	0	26
0.3	30	44
1.2	0	8
1.2	30	23

Operating environment

Operating temperature -40 ... +60 °C (-40 ... +140 °F)

Storage temperature -40 ... +70 °C (-40 ... 158 °F)

Operating humidity See graph 'GMP343 operating conditions'

Compensated pressure range 700 ... 1300 hPa

Operating pressure < 5 bar

Gas flow for flow-through model 0 ... 10 liters/min

EMC compliance IEC/EN 61326-1, Basic environment ¹⁾

¹⁾ Compliance with IEC/EN 61000-4-3: At 3 V/m RF field test within frequency range 300 ... 400 MHz may cause additional deviation of 150 ppmCO₂.

Inputs and outputs

Operating voltage 11 ... 36 VDC

Power consumption Without optics heating : < 1 W
With optics heating : < 3.5 W

Digital outputs RS-485, RS-232

Analogue outputs

Current output range 4 ... 20 mA

Current output resolution 14 bits

Current output maximum load 800 Ω at 24 VDC, 150 Ω at 10 VDC

Voltage output range 0 ... 2.5 V, 0 ... 5 V

Voltage output resolution 14 bits (13 bits with 0 ... 2.5 V)

Voltage output minimum load 5 kΩ

Mechanical specifications

Housing Anodized aluminium

Filter cover PC

Cable connector type 8-pin M12

Weight (probe only) 360 g (12.7 oz)

IP rating

Housing (cable attached) IP67

Diffusion filter (weather protection) IP65

Diffusion filter (sintered PTFE) IP66



Spare parts and accessories

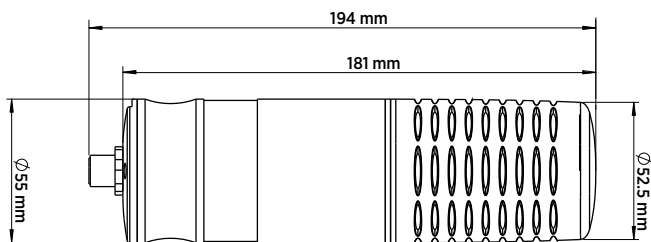
Wall mount bracket	GMP343BRACKET
Mounting flange	GMP343FLANGE
Standard diffusion filter (weather protection, IP65) with filter cover	GMP343FILTER
Diffusion filter (sintered PTFE filter, IP66) with filter cover	215521
Calibration adapter (for the diffusion model)	GMP343ADAPTER
Junction box	JUNCTIONBOX-8

Probe cables

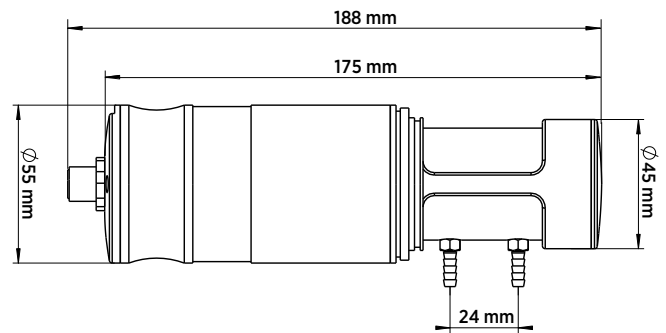
PC connection cable, 2 m (6 ft 7 in)	219687
Interface cable for MI70, 2 m (6 ft 7 in)	DRW216050SP
Soil adapter kit for horizontal positioning	215519
Soil adapter kit for vertical positioning	215520

Cable options

2 m (6 ft 7 in)	GMP343Z200SP
6 m (19 ft 8 in)	GMP343Z600SP
10 m (32 ft 10 in)	GMP343Z1000SP



GMP343 dimensions (diffusion model)



GMP343 dimensions (flow-through model)

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