

**VAISALA**

GMP343 Carbon Dioxide Probe  
For demanding measurements



Features

- Vaisala CARBOCAP® sensor, a silicon-based non-dispersive infrared (NDIR) sensor
- Single-beam, dual wavelength CO<sub>2</sub> 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 CO<sub>2</sub> soil respiration, ambient CO<sub>2</sub> 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 ±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 °C (-22 °F), 0 °C (32 °F), 25 °C (77 °F), and 50 °C (122 °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                      ±(3 ppm + 1 % of reading)  
0 ... 2000 ppm - 0 ... 2 %<sup>1)</sup>      ±(5 ppm + 2 % of reading)

### Noise (repeatability) at 370 ppmCO<sub>2</sub>

With no output averaging          ±3 ppmCO<sub>2</sub>  
With 30 s output averaging        ±1 ppmCO<sub>2</sub>

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

Easy                                    ±2 % of reading <sup>2)</sup>/ year  
Moderate                              ±2 % of reading <sup>2)</sup>/ 6 months  
Harsh                                   ±2 % of reading <sup>2)</sup>/ 3 months

### Warm-up time

To full accuracy ±0.5 %            10 min  
To full accuracy                      30 min

<sup>1)</sup> Accuracy below 200 ppmCO<sub>2</sub> not specified for 2 % range option.  
<sup>2)</sup> Always at least ±10 ppmCO<sub>2</sub>.

### Effect on accuracy with temperature compensation

CO<sub>2</sub> range options      0 ... 1000 ppm      0 ... 2 000 - 5000 ppm      0 ... 2 %

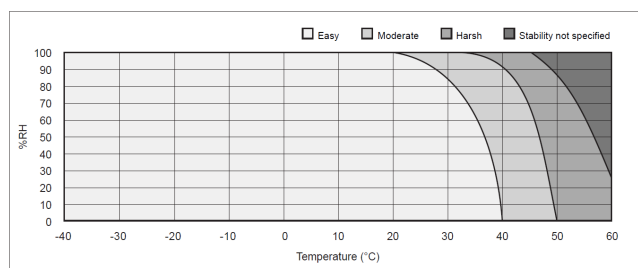
Temperature °C (°F)      Accuracy (% of reading)<sup>1)</sup>

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

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

-40 ... +10  
(-40 ... +50)                ±3                      ±3                      ±5

<sup>1)</sup> Always at least ±10 ppmCO<sub>2</sub>.  
Temperature compensation is performed by an integrated Pt1000 element.



## GMP343 operating conditions

### Effect on accuracy with pressure compensation

CO<sub>2</sub> 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 <sup>1)</sup>

<sup>1)</sup> 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 ppmCO<sub>2</sub>.

## 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

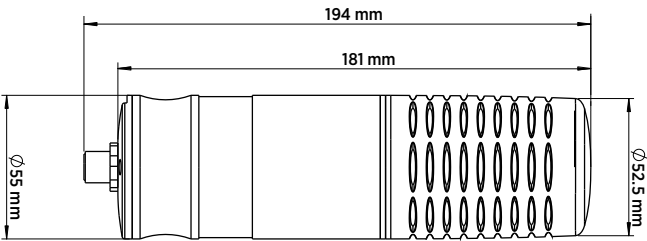
Housing (cable attached)            IP67

Diffusion filter (weather protection) IP65

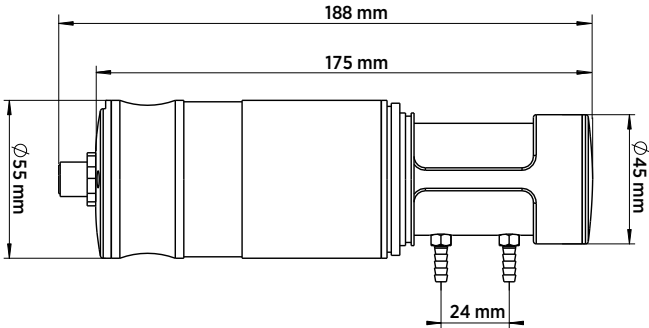
Diffusion filter (sintered PTFE)    IP66

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)