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_2 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_2 soil respiration, ambient CO_2 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

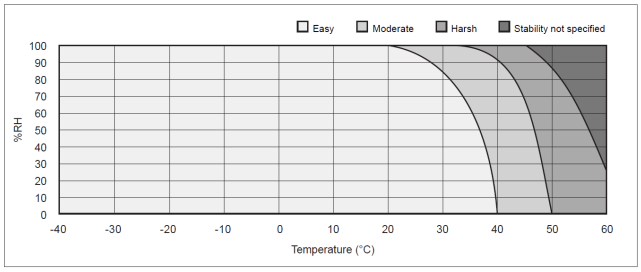
Measurement performance

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 %[1]	±(5 ppm + 2 % of reading)
Noise (repeatability) at 370 ppmCO_2	
With no output averaging	±3 ppmCO_2
With 30 s output averaging	±1 ppmCO_2
Long-term stability (see graph 'GMP343 operating conditions')	
Easy	±2 % of reading [2]/ year
Moderate	±2 % of reading [2]/ 6 months
Harsh	±2 % of reading [2]/ 3 months
Warm-up time	
To full accuracy ±0.5 %	10 min
To full accuracy	30 min

1) Accuracy below 200 ppmCO_2 not specified for 2 % range option.
2) Always at least ±10 ppmCO_2.

Effect on accuracy with temperature compensation			
CO_2 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 ±10 ppmCO_2.
Temperature compensation is performed by an integrated Pt1000 element.



GMP343 operating conditions

Effect on accuracy with pressure compensation		
CO_2 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 ppmCO_2.

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
Analog 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

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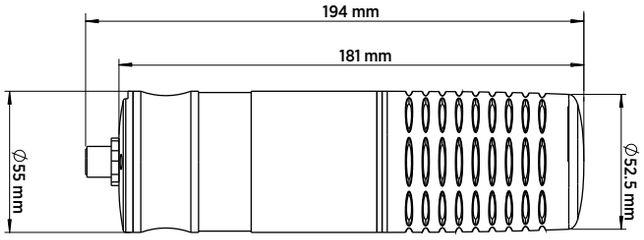
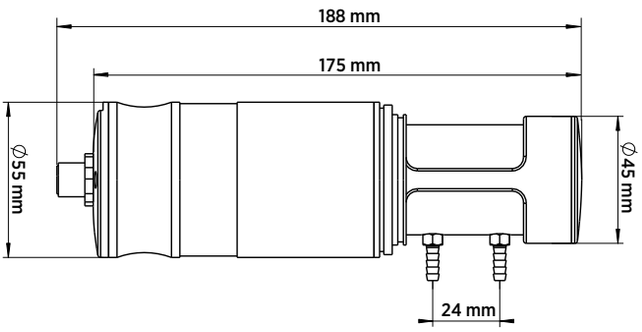


GMP343 dimensions (diffusion model)



GMP343 dimensions (flow-through model)

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