

GMP343 Carbon Dioxide Probe for Demanding Measurements



Features/Benefits

- Excellent accuracy and stability
- Vaisala CARBOCAP® Sensor, a silicon-based non-dispersive infrared (NDIR) sensor
- A single-beam, dual-wavelength CO₂ measurement with no moving parts
- Compensation options for temperature, pressure, humidity and oxygen
- Low power consumption and heat emission
- Designed for outdoor use
- Compact and lightweight

The GMP343 is available as an open-path diffusion-aspirated model (left) and as a flow-through model (right).

The 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.

The 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, the GMP343 provides a tool for accurate in-situ measurement. The 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, 0 °C, 25 °C and 50 °C. If needed, the customer can recalibrate the instrument using the multipoint calibration (MPC) feature allowing up to 8 user-defined calibration points.

Technical Data

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 %* $\pm(5 \text{ ppm} + 2 \% \text{ of reading})$

*Accuracy below 200 ppm CO₂ not specified for 2 % range option

Noise (repeatability) at 370 ppm CO₂

with no output averaging $\pm 3 \text{ ppm CO}_2$

with 30 s output averaging $\pm 1 \text{ ppm CO}_2$

TEMPERATURE

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)*		
+10 ... +40 (+50 ... +104)	± 1	± 1	± 2
+40 ... +60 (+104 ... +140)	± 2	± 3	± 4
-40 ... +10 (-40 ... +50)	± 3	± 3	± 5

* Always at least $\pm 10 \text{ ppm CO}_2$.

Temperature compensation is performed by an integrated Pt1000 element

Technical Data

PRESSURE

Effect on accuracy **with** pressure compensation:

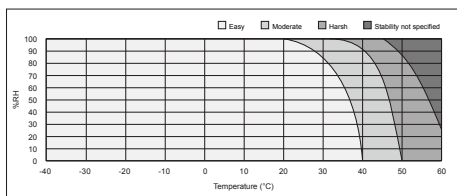
CO ₂ range options	0 ... 1000 ppm	0 ... 2000 - 2 %
Pressure (hPa)	Accuracy (% of reading)	
900 ... 1050	±0.5	±1
700 ... 1300	±1	±2

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

Long term stability see graph below
 easy ±2 % of reading * / year
 moderate ±2 % of reading * / 6 months
 harsh ±2 % of reading * / 3 months

* Always at least ±10 ppm CO₂.

GMP343 OPERATING CONDITIONS



Response time (90 %)

DIFFUSION MODEL		
Filter attached	Averaging (s)	Response (s)
Yes	0	75
Yes	30	82
No	0	<2
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

Warm-up time
 full accuracy ±0.5 % 10 min
 full accuracy 30 min

Operating Environment

Temperature	
operating	-40 ... +60 °C (-40 ... +140 °F)
storage	-40 ... +70 °C (-40 ... 158 °F)
Humidity	see graph 'GMP343 Operating Conditions'
Pressure	
compensated range	700 ... 1300 hPa
operating	<5 bar
Gas flow for flow-through model	0 ... 10 liters/min
Electromagnetic compatibility	EN61326, Generic Environment

Inputs and Outputs

Operating voltage	11 ... 36 VDC
Power consumption	
without optics heating	<1 W
with optics heating	<3.5 W
ANALOG OUTPUTS	
Current output	
range	4 ... 20 mA
resolution	14 bits
max. load	800 Ohm @ 24 VDC, 150 Ohm @ 10 VDC
Voltage output	
range	0 ... 2.5 V, 0 ... 5 V
resolution	14 bits (13 bits with 0 ... 2.5 V)
min. load	5 kOhm
DIGITAL OUTPUTS	RS485, RS232

Materials

Housing	anodized aluminium
Filter cover	PC
IP classification	
Housing (cable attached)	IP67
Diffusion filter (weather protection)	IP65
Diffusion filter (sintered PTFE)	IP66
Cable connector type	8-pin M12
Weight (probe only)	360 g

Options and Accessories

Wall mount bracket	GMP343BRACKET
Mounting flange	GMP343FLANGE
Standard diffusion filter (weather protection, IP65) +filter cover	GMP343FILTER
Diffusion filter (sintered PTFE filter, IP66) + filter cover	215521
Calibration adapter (for the diffusion model)	GMP343ADAPTER
Junction box	JUNCTIONBOX-8
Probe cables	
2m	GMP343Z200SP
6m	GMP343Z600SP
10m	GMP343Z1000SP
PC connection cable, 2m	213379
MI70 connection cable, 2m	DRW216050SP
USB adapter (USB-D9 Serial connection cable)	219686
Soil adapter kit for horizontal positioning	215519
Soil adapter kit for vertical positioning	215520

For full specifications, see the GMP343 User's Guide.

