

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 ±(3 ppm + 1 % of reading)
 0 ... 2000 ppm - 0 ... 2 %* ±(5 ppm + 2 % of reading)

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

Noise (repeatability) at 370 ppm CO₂
 with no output averaging ±3 ppm CO₂
 with 30 s output averaging ±1 ppm CO₂

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 |

For readings below 200 ppm CO₂ ±5 ppm CO₂
 Temperature compensation is performed by an integrated Pt1000 element

Technical data

PRESSURE

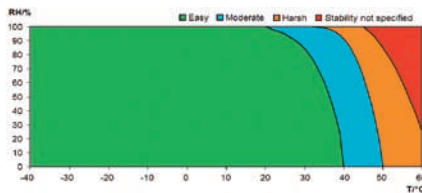
Effect on accuracy **with** pressure compensation:

| 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 |

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 | <1 W |
| 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 |

VAISALA

For more information, visit www.vaisala.com or contact us at sales@vaisala.com

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