



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 °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

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 ppmCO₂

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

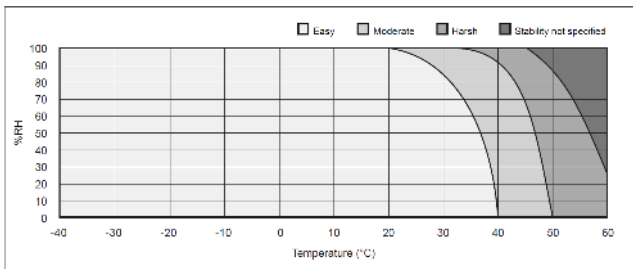
- 1) Accuracy below 200 ppmCO₂ not specified for 2 % range option
2) Always at least ±10 ppmCO₂.

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 ppmCO₂.
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	<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

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	EN61326, Generic Environment

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

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)	213379
MI70 connection cable, 2 m (6 ft 7 in)	DRW216050SP
USB adapter (USB-D9 Serial connection cable)	219686
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



Features

- Probe durable during heat sterilization up to +180 °C (+356 °F)
- Incubator can be sterilized with probe in place, saving time and reducing risk of cross-contamination
- Heat durability and superior long-term stability with next generation CARBOCAP® sensor
- Designed for OEM use in CO₂ incubators – installation options available
- CO₂ sensor measurement optimized for 5 % CO₂, measurement range up to 20 % CO₂
- 4-point traceable calibration for CO₂

Vaisala CARBOCAP® Carbon Dioxide Probe GMP231 withstands high temperature sterilization.

GMP231 is designed to provide incubator manufacturers with accurate and reliable carbon dioxide measurements and sterilization durability at high temperatures. The probe is based on Vaisala's patented CARBOCAP® technology and a new type of infrared (IR) light source. These technologies allow for sterilization temperatures of up to 180 °C (+356 °F), enabling easier and more complete sterilization without the risk of cross-contamination.

The probe is installed through the incubator wall, ensuring that only the IR sensor and optical components are exposed to the incubation

environment. This allows the incubator to be sterilized with the probe in place, removing the need to decontaminate the probe separately. This saves time and reduces the risk of contamination.

The probe's sensor performance is optimized at 5 %CO₂, but the sensor measures CO₂ up to 20 % with high accuracy. In addition, GMP231 can measure pressure and temperature for CO₂ measurement compensation purposes, ensuring the product remains stable and accurate in all CO₂ incubation conditions. The sensor is made of highly durable materials to achieve outstanding stability over both time and temperature.

Since water vapor, dust, and most chemicals do not affect measurements, GMP231 module is ideal for CO₂ incubator environments.

Benefits

- Internal pressure and temperature measurement improves accuracy and stability
- Full temperature and pressure compensations available
- Sensor head heating for condensation prevention

Technical Data

Measurement Performance

Measurement range	0 ... 20 %CO ₂
Calibration uncertainty at 5 %CO ₂	±0.1 %CO ₂
Start-up time	< 20 s
Warm-up time for full spec.	< 3 min

Response Time

T63	< 30 s
T90	< 50 s

Accuracy at 37 °C, 1013 hPa

Repeatability at:	
0 ... 8 %CO ₂	±0.1 %CO ₂
8 ... 12 %CO ₂	±0.2 %CO ₂
12 ... 20 %CO ₂	±0.4 %CO ₂
Non-linearity at 0 ... 20 %CO ₂	±0.1 %CO ₂

Temperature Dependence

With compensation at 3 ... 12 %CO ₂ , 20 ... 60 °C	±0.1 %CO ₂
Without compensation (typical)	-0.4 % of reading/°C

Pressure Dependence

With compensation at 3 ... 12 %CO ₂ , 700 ... 1100 hPa	±0.015 % of reading/hPa
Without compensation (typical)	+0.15 % of reading/hPa

Humidity Dependence

With compensation at 0 ... 20 %CO ₂ , 0 ... 100 %RH	±0.9 % of reading (at 37 °C)
Without compensation (typical)	+0.05 % of reading/%RH

O₂ dependence

With compensation at 0 ... 20 %CO ₂ , 0 ... 90 %O ₂	±0.6 % of reading
Without compensation (typical)	-0.08 % of reading/%O ₂

Long-term Stability

0 ... 8 %CO ₂	< ±0.2 %CO ₂ /year
8 % ... 12 %CO ₂	< ±0.5 %CO ₂ /year
12 % ... 20 %CO ₂	< ±1.0 %CO ₂ /year

Mechanical Specifications

Connector	M12/8 pin
Weight	150 g (5.29 oz) without cable
IP rating	IP54 (sensor head) IP20 (electronics housing)

Materials

Housing	Metal coated plastic ABS+PC
Inner tube	Aluminum
Probe tube	PPSU
Filter	PTFE

Dimensions

Probe tube max. diameter	30.2 mm (1.19 in)
Probe tube length	118.5 mm (4.67 in)
Sensor filter length	12 mm (0.47 in)

Operating Environment

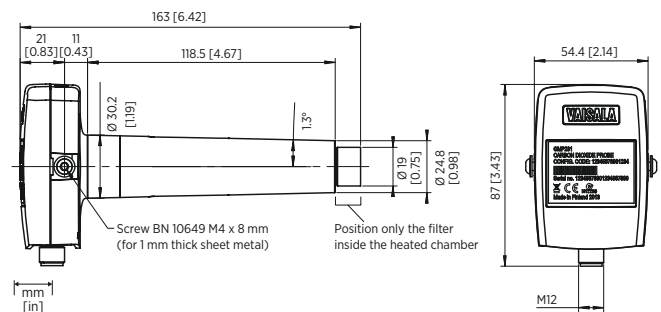
Operating temperature for CO ₂ measurement	0 ... +70 °C (+32 ... +158 °C)
Max. temperature durability in standby mode (sensor head only)	Max. +195 °C (Max. +383 °C)
Heat sterilization 180 °C durability	At least 120 cycles
Storage temperature	-40 ... +75 °C (-40 ... +167 °C)
Pressure (compensated)	500 ... 1100 hPa
Pressure (operating)	< 1500 hPa
Humidity	0 ... 100 %, non-condensing
Condensation prevention	Sensor head heating when power on
Chemical tolerance	DMSO, IPA (70 %), H ₂ O ₂ (2000 ppm, non-condensing), ethanol, acetic acid
Electromagnetic compatibility	EN61326-1, Generic Environment

Inputs and Outputs

Digital outputs	I ² C 5 V, RS-485 (2-wire with Vaisala industrial protocol)
Analog output	0 ... 20 mA (scalable) max. load 600 Ω
Power consumption	< 1 W (pulsed)
Operating voltage	11 ... 30 VDC 20 ... 30 VDC (with analog output)

Accessories

M12 Connection Cable 0.9 m with open ends	DRW240977SP
M12 Connection Cable 0.6 m with Milli-Grid connector	ASM210903SP
Service cable for MI70	221801
Silicone plug	DRW240015SP
Attachment bracket	DRW240247SP
PTFE filter	DRW240494SP
USB PC connection cable	DRW240494SP
Calibration adapter for GMP231	239523



Dimensions



Features

- Measurement range 0 ... 20 %CO₂
- Intelligent, stand-alone probe with analog and digital outputs
- Compatible with Indigo 200 transmitters and Vaisala Insight
- Wide operating temperature range -40 ... +60 °C
- IP65-classified housing
- Full temperature and pressure compensations
- 2nd-gen proprietary CARBOCAP® technology
- Integrated temperature measurement for CO₂ compensation purposes
- Compensations for background gases, O₂, and humidity
- Sensor head heated to prevent condensation

Vaisala CARBOCAP® Carbon Dioxide Probe GMP251 is a new intelligent probe for measuring carbon dioxide. This robust, stand-alone measurement device is designed for use in demanding applications, such as life science incubators, where stable, reliable, and accurate performance is required.

Benefits

- Superior long-term stability
- Reliable and accurate
- Calibration certificate included

GMP251 is based on Vaisala's unique, second-generation CARBOCAP technology that enables exceptional stability. A new type of infrared (IR) light source is used instead of the traditional incandescent light bulb, which extends the lifetime of GMP251.

GMP251 incorporates an internal temperature sensor for compensation of the CO₂ measurement according to ambient temperature. The effects of pressure and background gas can also be compensated for. The measurement range is 0 ... 20 %CO₂ and the sensor performance is optimized at 5 %CO₂ measurement.

The operating temperature range of the probe is wide (-40 ... +60 °C (-40 ... +140 °F)), and the probe housing is classified as IP65. Condensation is prevented as the internal sensor head is heated.

GMP251 is resistant to dust and most chemicals, such as, H₂O₂ and alcohol-based cleaning agents.

Ease of Use

GMP251 is a compact probe with easy and fast plug-in, plug-out installation. The surface of the probe is smooth, which makes it easy to clean. The probe provides several output options, including analog current and voltage outputs and digital RS-485 output with Modbus protocol.

GMP251 can be connected to Indigo 200 series transmitters for an extended range of output and configuration options. See www.vaisala.com/indigo.

For easy-to-use access to field calibration, device analytics, and configuration functionality, the probe can be connected to Vaisala Insight PC Software (for Windows® 7, 8.1 and 10: see www.vaisala.com/insight).

Applications

GMP251 is ideal for life science incubators, cold storages, fruit and vegetable transportation, and for all demanding applications where stable and accurate %-level CO₂ measurements are needed.

Technical Data

Measurement Performance

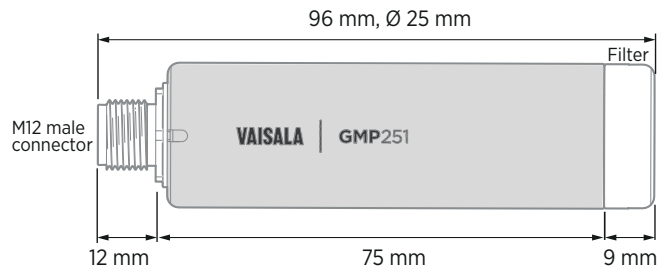
Measurement range	0 ... 20 %CO ₂
Accuracy at 25 °C (77 °F) and 1013 hPa (incl. Repeatability and Non-linearity)	
At 5 %CO ₂	±0.1 %CO ₂
0 ... 8 %CO ₂	±0.2 %CO ₂
8 ... 20 %CO ₂	±0.4 %CO ₂
Calibration Uncertainty	
At 5 %CO ₂	±0.12 %CO ₂
At 20 %CO ₂	±0.32 %CO ₂
Long-Term Stability	
0 ... 8 %CO ₂	±0.3 %CO ₂ /year
8 ... 12 %CO ₂	±0.5 %CO ₂ /year
12 ... 20 %CO ₂	±1.0 %CO ₂ /year
Temperature Dependence	
With compensation at 5 %CO ₂ , 0 ... +50 °C (+32 ... +122 °F)	< ±0.05 %CO ₂
With compensation, 0 ... 20 %CO ₂ , -40 ... +60 °C (-40 ... +140 °F)	±0.045 % of reading/°C
Without temperature compensation at 5 %CO ₂ (typical)	-0.25 % of reading/°C
Pressure Dependence	
With compensation at 5 %CO ₂ 700 ... 1100 hPa	±0.05 %CO ₂
With compensation, 0 ... 20 %CO ₂ 500 ... 1200 hPa	±0.015 % of reading/hPa
Without compensation (typical)	+0.15 % of reading/hPa
Humidity Dependence	
With compensation, 0 ... 20 %CO ₂ , 0 ... 100 %RH	±0.7 % of reading (at +25 °C (+77 °F))
Without compensation (typical)	+0.05 % of reading / %RH
O₂ Dependence	
With compensation, 0 ... 20 %CO ₂ , 0 ... 90 %O ₂	±0.6 % of reading (at +25 °C (+77 °F))
Without compensation (typical)	-0.08 % of reading / %O ₂
Flow Rate Dependence (for Flow-Through Model Option)	
< 1 l/min flow	No effect
1 ... 10 l/min flow	< 0.6 % of reading/ l/min
Start-up time at +25 °C (+77 °F)	< 10 s
Warm-up time for full spec.	< 4 min
Response Time (T₉₀)	
With standard filter	< 1 min
Flow-through model with > 0.1 l/min	< 1 min
With spray shield	< 2 min

Operating Environment

Operating temperature of CO ₂ measurement	-40 ... +60 °C (-40 ... +140 °F)
Storage temperature	-40 ... +70 °C (-40 ... +158 °F)
Pressure	
Compensated	500 ... 1100 hPa
Operating	< 1.5 bar
Humidity	0 ... 100 %RH, non-condensing
Gas Flow (for Flow-Through Option)	
Operating range	< 10 l/min
Recommended range	0.1 ... 0.8 l/min
Condensation prevention	Sensor head heating, when power on
EMC compliance	EN61326-1, Generic Environment
Chemical tolerance (temporary exposure during cleaning)	<ul style="list-style-type: none"> • H₂O₂ (2000 ppm, non-condensing) • Alcohol-based cleaning agents (for example ethanol and IPA) • Acetone • Acetic acid

Mechanical Specifications

Weight, probe	45 g (1.59 oz)
Materials	
Probe housing	PET plastic
Filter	PTFE membrane, PET plastic grid
Connector	Nickel plated brass, M12 / 5 pin
IP rating, probe body	IP65
Connector	M12 5-pin male
Dimensions	
Probe diameter	25 mm (0.98 in)
Probe length	96 mm (3.78 in)



Inputs and Outputs

Analog outputs	<ul style="list-style-type: none">• 0 ... 5/10 V (scalable), min load 10 kΩ• 0/4 ... 20 mA (scalable), max load 500 Ω
Digital output	Over RS-485: <ul style="list-style-type: none">• Modbus• Vaisala Industrial Protocol

Operating Voltage

With digital output in use	12 ... 30 VDC
With voltage output in use	12 ... 30 VDC
With current output in use	20 ... 30 VDC

Power Consumption

Typical (continuous operation)	0.4 W
Maximum	0.5 W

Spare Parts and Accessories

Standard membrane filter	ASM211650SP
Porous sintered PTFE filter (extra protection)	DRW243649SP
Probe cable with open wires (1.5 m)	223263SP
Probe cable with open wires and 90° plug (0.6 m)	244669SP
Probe cable with open wires (10 m)	216546SP
Flow-through adapter with gas ports	ASM211697SP
USB cable for PC connection ¹⁾	242659
M170 connection cable for probe	CBL210472
Flat cable for GMP250 probes, M12 5-pin	CBL210493SP
Probe mounting clips (2 pcs)	243257SP
Probe mounting flange	243261SP
Calibration adapter	DRW244827SP
Spray shield	ASM212017SP

Transmitters

Indigo 200 series	See www.vaisala.com/indigo
-------------------	--

¹⁾ Vaisala Insight software for Windows available at www.vaisala.com/insight





Features

- Measurement range 0 ... 10 000 ppmCO₂
- Intelligent, stand-alone probe with analog and digital outputs
- Compatible with Indigo 200 transmitters and Vaisala Insight
- Wide operating temperature range -40 ... +60 °C
- IP65-classified housing
- 2nd-gen proprietary CARBOCAP® technology
- Full temperature and pressure compensations
- Integrated temperature measurement for CO₂ compensation purposes
- Compensations for background gases, O₂, and humidity
- Sensor head heated to prevent condensation

Vaisala CARBOCAP® Carbon Dioxide Probe GMP252 is a new intelligent probe for measuring carbon dioxide. This robust, stand-alone measurement device is designed for use in agriculture, refrigeration, greenhouses and demanding HVAC applications.

Benefits

- Superior long-term stability
- Reliable and accurate
- Calibration certificate included

GMP252 is suitable for harsh and humid CO₂ measurement environments where stable and accurate ppm-level CO₂ measurements are needed. GMP252 is based on Vaisala's unique, second-generation CARBOCAP technology that enables exceptional stability. A new type of infrared (IR) light source is used instead of the traditional incandescent light bulb, which extends the lifetime of GMP252.

GMP252 incorporates an internal temperature sensor for compensation of the CO₂ measurement according to ambient temperature. The effects of

pressure and background gas can also be compensated for. The measurement range is 0 ... 10 000 ppmCO₂ (measurements up to 30 000 ppmCO₂ are available with reduced accuracy). The operating temperature range of the probe is wide (-40 ... +60 °C (-40 ... +140 °F)), and the probe housing is classified as IP65. Condensation is prevented as the internal sensor head is heated.

GMP252 is resistant to dust and most chemicals, such as, H₂O₂ and alcohol-based cleaning agents.

Ease of Use

GMP252 is a compact probe with easy and fast plug-in, plug-out installation. The surface of the probe is smooth, which makes it easy to clean. The probe

provides several output options, including analog current and voltage outputs and digital RS-485 output with Modbus protocol.

GMP252 can be connected to Indigo 200 series transmitters for an extended selection of outputs and configuration options. See www.vaisala.com/indigo.

For easy-to-use access to field calibration, device analytics, and configuration functionality, the probe can be connected to Vaisala Insight PC Software (for Windows® 7, 8.1 and 10: see www.vaisala.com/insight).

Applications

GMP252 is ideal for agriculture, refrigeration, greenhouses and demanding HVAC applications where stable and accurate ppm-level CO₂ measurements are needed.

Technical Data

Measurement Performance

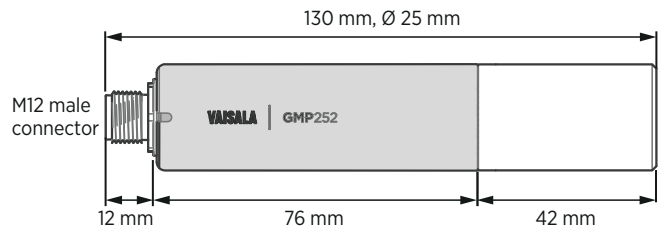
Measurement range	0 ... 10 000 ppmCO ₂ (up to 30 000 ppmCO ₂ with reduced accuracy)
Accuracy at 25 °C and 1013 hPa (incl. Repeatability and Non-Linearity)	
0 ... 3000 ppmCO ₂	±40 ppmCO ₂
3000 ... 10 000 ppmCO ₂	±2 % of reading
Up to 30 000 ppmCO ₂	±3.5 % of reading
Calibration Uncertainty	
at 2000 ppmCO ₂	±38 ppmCO ₂
at 10 000 ppmCO ₂	±105 ppmCO ₂
Long-Term Stability	
0 ... 3000 ppmCO ₂	±60 ppmCO ₂ /year
3000 ... 6000 ppmCO ₂	±150 ppmCO ₂ /year
6000 ... 10 000 ppmCO ₂	±300 ppmCO ₂ /year
Temperature Dependence 0 ... 10 000 ppmCO₂	
with compensation, -10 ... +50 °C	±0.05 % of reading/°C
with compensation, -40 ... +60 °C	< ±0.1 % of reading/°C
without temperature compensation at 2000 ppmCO ₂ (typical)	-0.5 % of reading/°C
Pressure Dependence	
with compensation at 0 ... 10 000 ppmCO ₂ , 500 ... 1100 hPa	±0.015 % of reading/hPa
without compensation (typical)	+0.15 % of reading/hPa
Humidity Dependence	
with compensation, 0 ... 10 000 ppmCO ₂ , 0 ... 100 %RH	±0.7 % of reading (at +25 °C (+77 °F))
without compensation (typical)	+0.05 % of reading/%RH
O₂ Dependence	
with compensation, 0 ... 10 000 ppmCO ₂ , 0 ... 90 %O ₂	±0.6 % of reading (at +25 °C (+77 °F))
without compensation (typical)	-0.08 % of reading/%O ₂
Start-Up, Warm-Up and Response Time	
Start-up time at +25 °C	< 12 s
Warm-up time for full spec.	< 2 min
Response time (T90) with standard filter	< 1 min
Response time (T90) with spray shield	< 3 min
Flow-Through Option	
Response time (T90) with > 0.1 l/min	30 s
Flow rate dependence < 1 l/min flow	no effect
Flow rate dependence 1 ... 10 l/min flow	< 0.6% of reading l/min
Gas flow operating range	< 10 l/min
Gas flow recommended range	0.1 ... 0.8 l/min

Operating Environment

Operating temperature of CO ₂ measurement	-40 ... +60 °C (-40 ... +140 °F)
Storage temperature	-40 ... +70 °C (-40 ... +158 °F)
Humidity	0 ... 100 %RH, non-condensing
Condensation prevention	Sensor head heating when power on
EMC compliance	EN61326-1, Generic Environment
Chemical tolerance (temporary exposure during cleaning)	<ul style="list-style-type: none"> H₂O₂ (2000 ppm, non-condensing) Alcohol-based cleaning agents (for example ethanol and IPA) Acetone Acetic acid
Pressure	
Compensated	500 ... 1100 hPa
Operating	< 1.5 bar

Mechanical Specifications

Weight, probe	58 g (2.05 oz)
Connector type	M12 5-pin male
IP rating, probe body	IP65
Materials	
Probe housing material	PBT plastic
Filter	PTFE
Connector	Nickel plated brass
Dimensions	
Probe diameter	25 mm (0.98 in)
Probe length	130 mm (5.12 in)



Inputs and Outputs

Digital output	Over RS-485: <ul style="list-style-type: none"> • Modbus • Vaisala Industrial Protocol
Analog output	<ul style="list-style-type: none"> • 0 ... 5/10 V (scalable), min load 10 kΩ • 0/4 ... 20 mA (scalable), max load 500 Ω
Operating voltage	
With digital output in use	12 ... 30 VDC
With voltage output in use	12 ... 30 VDC
With current output in use	20 ... 30 VDC
Power consumption	
Typical (continuous operation)	0.4 W
Maximum	0.5 W
When connected to Indigo 200 transmitter	
Analog output	3 voltage (V) or current (mA) outputs: <ul style="list-style-type: none"> • 0 ... 10 VDC / 0 ... 5 VDC / 0 ... 1 VDC / 1 ... 5 VDC (min load 1kΩ) • 0 ... 20 mA / 4 ... 20 mA (max load 500 Ω)
Relays	2 configurable relays
Power supply input	Nominal 24 V, range: <ul style="list-style-type: none"> • 15 ... 40 VDC • 20 ... 28 VAC
Power consumption	Max. 3.5 W (transmitter + probe total max. consumption)

Spare Parts and Accessories

Porous sintered PTFE filter for GMP252	DRW244221SP
Probe cable with open wires (1.5 m)	223263SP
Probe cable with open wires and 90° plug (0.6 m)	244669SP
Probe cable with open wires (10 m)	216546SP
Flow-through adapter with gas ports	ASM212011SP
USB cable for PC connection ¹⁾	242659
MI70 connection cable for probe	CBL210472
Flat cable for GMP250 probes, M12 5-pin	CBL210493SP
Probe mounting clips (2 pcs)	243257SP
Probe mounting flange	243261SP
Calibration adapter	DRW244827SP
Spray shield	ASM212017SP
Radiation shield DTR250	DTR250
Radiation shield DTR250 with pole mounting kit	DTR250A
Transmitters	
Indigo 200 series	See www.vaisala.com/indigo

¹⁾ Vaisala Insight software for Windows available at www.vaisala.com/insight



The Vaisala CARBOCAP® Handheld Carbon Dioxide Meter GM70 is the demanding professional's choice for hand-held carbon dioxide measurement. The meter consists of the indicator (center) and probe, used either with the handle (left) or pump (right).

Features

- Two optional sampling methods: diffusion or pump aspiration
- User-friendly meter with multilingual user interface
- Numerical and graphical display of measurements
- Data can be logged and transferred to PC via MI70 Link software

GM70 is a user-friendly meter for demanding spot measurements in laboratories, greenhouses and mushroom farms. The meter can also be used in HVAC and industrial applications, and as a tool for checking fixed CO₂ instruments.

GM70 has a short warm-up time and is ready for use almost immediately. It has a menu-based interface, a graphical LCD display and data logging capability.

Vaisala CARBOCAP® Technology

GM70 incorporates the advanced CARBOCAP sensor that has unique reference measurement capabilities. The measurement accuracy is not affected by dust, water vapor or most chemicals. The meter has a two-year recommended calibration interval.

Two Sampling Methods

The handle is for hand-held diffusion sampling. GM70 pump enables pump-aspirated sampling from locations difficult to access otherwise. It is also ideal for comparisons with fixed CO₂ transmitters.

Interchangeable Probes

GM70 uses the same probes as Vaisala CARBOCAP Carbon Dioxide Transmitter Series GMT220. By plugging different probes into the handle or pump, the user can easily change the measurement range of the GM70.

The meter can also be used as a calibration check instrument for Vaisala's fixed CO₂ instruments. GMW90 and GMP220 probes can also be adjusted by using the GM70 meter. GM70 has two probe inputs. Vaisala's relative humidity and dewpoint probes can also be used simultaneously with CO₂ measurement.

MI70 Link

The optional MI70 Link Windows® software and the USB connection cable form a practical tool for transferring logged data and real time measurement data from GM70 to a PC.

Benefits

- Proven Vaisala CARBOCAP® reliability
- Wide selection of measurement ranges
- Easy recalibration using the interchangeable probes
- Suitable for field checking of fixed CO₂ instruments
- Short warm-up time
- Compact and versatile

Technical Data

CO₂ Volume Concentration Measurement Performance, GMH70 Probe

Response Time (63 %)

GMP221	20 s
GMP222	30 s

Measurement Ranges

High concentrations, short probe (GMP221)	0 ... 2 % 0 ... 3 % 0 ... 5 %, 0 ... 10 %, 0 ... 20 %
Low concentrations, long probe (GMP222)	0 ... 2000 ppm, 0 ... 3000 ppm, 0 ... 5000 ppm, 0 ... 7000 ppm, 0 ... 10 000 ppm

Accuracy at 25 °C and 1013 hPa¹⁾

GMP221	±(1.5 % of range + 2 % of reading) ²⁾
GMP222	±(1.5 % of range + 2 % of reading)
Temperature dependence, typical	-0.3 % of reading/°C
Pressure dependence, typical	+0.15 % of reading/hPa
Long-term stability	< ±5 %FS / 2 years
Warm-up time	30 s, 15 min full specifications

1) Including repeatability, non-linearity and calibration uncertainty.

2) Applies for concentrations above 2 % of full scale.

Measurement Environment

Temperature	-20 ... +60 °C (-4 ... +140 °F)
Relative humidity	0 ... 100 %RH, non-condensing
Operation pressure	700 ... 1300 hPa
Flow range (diffusion sampling)	0 ... 10 m/s

Probe, Handle & Pump Mechanical Specifications

Sensor	Vaisala CARBOCAP®
Housing Material	
GMP221/222 probe	PC plastic
GMH70 handle	ABS/PC blend
GM70 Pump	Aluminium casing
Weight	
GMH70 with GMP221/222 probe	230 g
GM70 Pump with GMP221/222 probe	700 g

Probe, Handle & Pump Operating Environment

Storage temperature	-30 ... +70 °C (-22 ... +158 °F)
Storage humidity	0 ... 100 %RH, non-condensing

MI70 Measurement Indicator

Operating Environment

Operating temperature	-10 ... +40 °C (+14 ... +104 °F)
Operating humidity	0 ... 100 %RH, non-condensing
Storage temperature	-40 ... +70 °C (-40 ... +158 °F)

Inputs and Outputs

Max. no of probes	2
Power supply	Rechargeable NiMH battery pack with AC adapter or 4xAA size alkalines, type IEC LR6
PC interface	MI70 Link software with USB or serial port cable

Analog Output	
Scale	0...1 VDC
Output resolution	0.6 mV
Accuracy	0.2 % full scale
Temperature dependence	0.002 %/°C (0.01 %/°F) full scale
Minimum load resistor	10 kΩ to ground

Mechanical Specifications

Housing classification	IP54
Housing materials	ABS/PC blend
Weight	400 g (14 oz)

Compatibility

EMC compliance	EN61326-1, Portable Equipment
----------------	-------------------------------

Other

Menu languages	English, Chinese, Spanish, Russian, French, Japanese, German, Swedish, Finnish
Display	<ul style="list-style-type: none"> LCD with backlight Graphic trend display of any parameter Character height up to 16 mm (0.63 in)
Alarm	Audible alarm function
Data logging capacity	2700 real time data points
Logging interval	1 s to 12 h
Logging duration	1 min ... memory full
Resolution	0.01 %RH, 0.01 °C/°F, 0.01 hPa, 0.01 a _w , 10 ppm / 0.01 %CO ₂

Battery Operation Time

Typical charging time	4 hours
Operation Times	
Continuous use (with handle)	Better than 8 h at +20 °C (68 °F)
Continuous use (with pump)	Better than 5 h at +20 °C (68 °F) without load
Data logging use (one probe)	Up to 30 days depending on logging interval



Dimensions in mm (inches)

Spare Parts and Accessories

MI70 Link software with USB cable	219687
MI70 Link software with serial port cable	MI70LINK
Analog output cable for 0 ... 1 VDC	27168ZZ
Calibration adapter	26150GM
Weatherproof carrying case	MI70CASE3
Soft carrying case for diffusion handle and probe	MI70SOFTCASE
Battery, NiMH 4.8 V	26755
Spare probe (use the order form to define measurement range etc.)	GMP221, GMP222
Nafion Membrane Tubing	212807GM
Connection Cable for Fixed CO₂ Instruments	
GMT220, GMD20	GMA70
GMP343	DRW216050SP
GMW90 series	219980SP