



GMP252 Carbon Dioxide Probe

For ppm-level measurements



Features

- Measurement range
0 ... 10 000 ppmCO₂
- Intelligent, stand-alone probe with analog and digital outputs
- Compatible with Indigo transmitters and Insight PC software
- Wide operating temperature range (-40 ... +60 °C)
- IP65-classified housing
- 2nd-generation 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 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. 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

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|-------------------|--|
| Measurement range | 0 ... 10 000 ppmCO ₂ (up to 30 000 ppmCO ₂ with reduced accuracy) |
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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

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|------------------------------------|-------------------------------|
| 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

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|---|-------------------------|
| 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

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|--|--|
| 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

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|---|--|
| with compensation, 0 ... 10 000 ppm %CO 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

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| 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

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| 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

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| Operating temperature of CO ₂ measurement | -40 ... +60 °C (-40 ... +140 °F) |
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|---------------------|----------------------------------|
| Storage temperature | -40 ... +70 °C (-40 ... +158 °F) |
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| Humidity | 0 ... 100 %RH, non-condensing |
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| Condensation prevention | Sensor head heating when power on |
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| EMC compliance | EN61326-1, Generic environment |
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| 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 |
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Pressure

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| Compensated | 500 ... 1100 hPa |
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| Operating | < 1.5 bar |
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Mechanical specifications

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| Weight, probe | 58 g (2.05 oz) |
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| Connector type | M12 5-pin male |
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| IP rating, probe body | IP65 |
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Materials

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| Probe housing material | PBT polymer |
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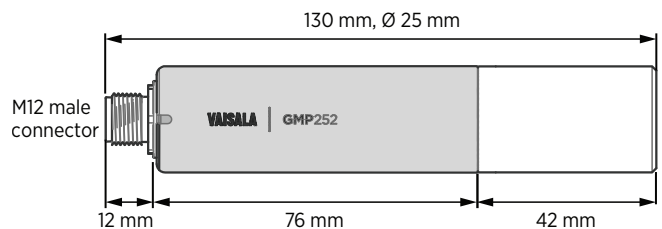
| | |
|--------|------|
| Filter | PTFE |
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| Connector | Nickel plated brass |
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Dimensions

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| Probe diameter | 25 mm (0.98 in) |
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| Probe length | 130 mm (5.12 in) |
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Inputs and outputs

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| 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

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| 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 |

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

