Quick Guide | Vaisala CARBOCAP® Portable Carbon Dioxide Probe with Pump Sampling GMP80P

Product overview

Vaisala GMP80P CO_2 probe has been designed for portable sampling and spot-checking use with incubators and fixed CO_2 transmitters. CO_2 measurement data can be monitored with Vaisala Indigo80 Handheld Indicator connected to GMP80P. Indigo80 can be used for short-time logging of measurement data, as well as for calibrating and adjusting the GMP251 probe incorporated in GMP80P. GMP80P is powered by Indigo80, which can supply power for up to two GMP80P probes. For more information on Indigo80, see www.vaisala.com/indigo80.

For easy access to field calibration, device analytics, configuration functionality, and powering, GMP80P can also be connected to a PC running Vaisala Insight PC software for Windows®. For more information on Insight, see www.vaisala.com/insight.

> In addition to this Quick Guide, see also the following documents, available at docs.vaisala.com:
> - GMP80P Datasheet (B212721EN) for technical specifications, product dimensions, and list of spare parts.
> - GMP251 User Guide (M211799EN) for more information about the Vaisala GMP251 CO_2 probe incorporated in GMP80P.
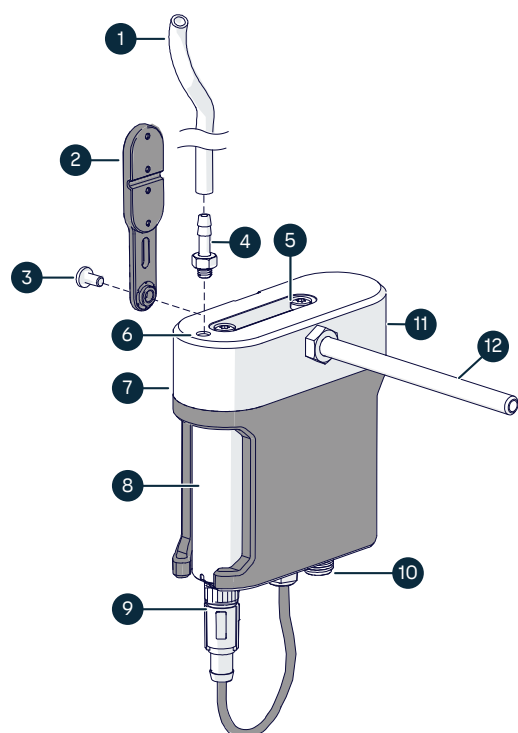
Probe structure

Figure 1   GMP80P probe structure

1   Optional plastic tube for gas outlet (not provided by Vaisala)
2   Magnetic hanger for attaching GMP80P to metallic surfaces
3   Hex-head screw (M4×8) for magnetic hanger
4   Gas port, suitable for ID 4 mm (approx. ID 5/32 in) polyurethane or silicone tubing
5   Condensation window
6   Gas outlet
7   CO_2 measurement chamber
8   Vaisala GMP251 CO_2 probe
9   M12-5F A-coded cable connector for CO_2 probe
10 M12-5M A-coded connector for probe connection cable 272075SP (connection to Indigo80 indicator)
11 Type label at the back of the device
12 Gas inlet through steel pipe (optional polyurethane or Nafion™ membrane tube also available)

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Connecting probes to Indigo80

Up to two Vaisala Indigo-compatible probes or transmitters can be connected to the ports located on the bottom of Indigo80. You can connect and disconnect devices both when the indicator is powered on and when it is off.

Vaisala recommends using cables provided by Vaisala when connecting devices to the indicator. Cables and other accessories are available to order at store.vaisala.com. To connect GMP80P to Indigo80, use Vaisala probe connection cable **272075SP**.

▶ 1. If the indicator is powered and no devices are connected to it, the text **Please connect a probe** will be shown on the display.

2. Insert the probe connection cable in one of the ports on the bottom of the indicator.
    - **Note the orientation of the cable connector when inserting it**
    - **Hold the connector in place while turning its locking ring clockwise – never twist the connector body!**
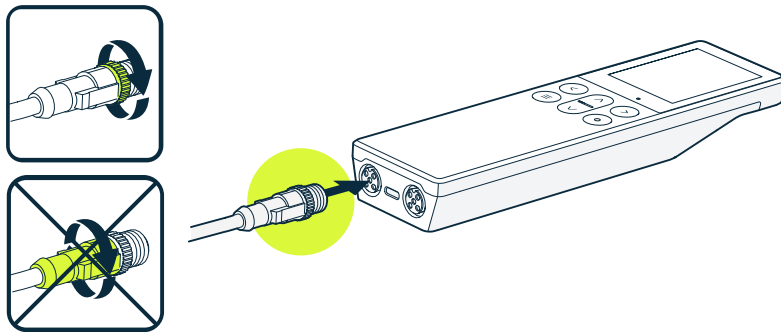
3. Connect the probe to the M12-5F end of the probe connection cable.
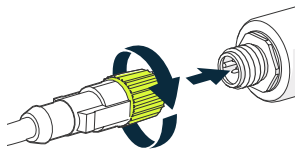
When the indicator recognizes the connected probe, it shows a notification on the display, for example, **GMP251 connected**. Note that Indigo80 identifies the GMP80P probe as **GMP251**.
A probe connected to the leftmost port in the indicator is labeled ❶ on the indicator's display, while the probe in the rightmost port is labeled ❷.

4. To change probes, simply detach the cable from the probe and connect a new probe.

> ℹ️ For optimal measurement accuracy, the indicator guides you to check the connected probe's environment settings next.

> ℹ️ For more information on Indigo80 features and functions, see Indigo80 User Guide (M212722EN), available at docs.vaisala.com.

GMP80P installation and sampling

Typical conditions inside incubators are warm and humid (37 °C (98.6 °F), > 90 %RH). This means that condensed water will form easily in the tubing between GMP80P and the incubator, or inside the measurement chamber of GMP80P (when sampling with the steel pipe). To prevent condensation from affecting measurement accuracy, note the condensation prevention considerations in the following sections.

> ℹ️ As the gas sample dries during the sampling process, the CO_2 concentration of the dry sample will be higher than in the wet sample taken in the measurement environment. This is due to water condensing off the warm gas sample as it cools down. To determine the most accurate measurement values in your sampling environment, see GMP251 User Guide (M211799EN) at docs.vaisala.com for a table listing the dilution coefficients for gas samples taken at different temperatures.
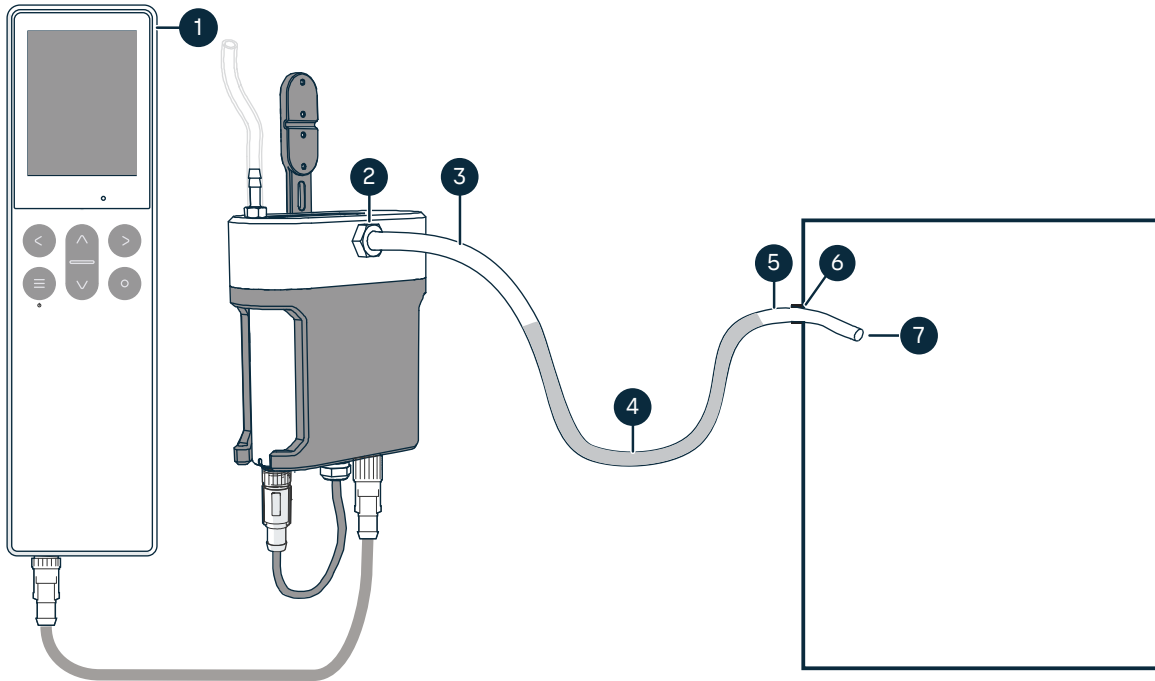
Sampling using plastic tube

Figure 2 CO_2 sampling from incubator using tube, with GMP80P connected to Indigo80

1   Indigo80 indicator
2   Adapter for sampling tube (Vaisala item code 279473SP)
3   Sampling tube (polyurethane or silicone), OD 6 mm (approx. 15/64 in)
4   Section of Nafion membrane tube (moisture exchanger) for optimal condensation prevention. Recommended minimum length approx. 25 cm (10 in).
5   Short section of silicone or polyurethane tube. Nafion membrane tube is not recommended to be inserted through the incubator sampling port.
6   Incubator sampling port
7   Tube inserted into the measurement environment by approx. 5 cm (2 in)

- Position GMP80P higher than the incubator sampling port and leave a loose length of tube hanging between the probe and the incubator (see the figure above).
- Make sure the tube is inserted fully (by approx. 5 cm (2 in)) into the measurement environment.
- Use a Nafion membrane tube for sampling to maximize transfer of water vapor from the sample to ambient air. For more information about the Nafion tube and instructions for use, see GMP251 User Guide (M211799EN), available at docs.vaisala.com.
- There is no specific time limit for sampling, but **you need to remove condensed water from the tube from time to time**. Condensation will start to form inside the tube within 5 minutes, actual droplets of water within hours.

To remove condensed water from the sampling tube:

▶ 1.   Stop the measurement by switching off Indigo80 or by disconnecting GMP80P from Indigo80.
   2.   Detach the tube from GMP80P and the incubator.
   3.   Shake the tube to remove any condensed water from inside. Alternatively, you can use compressed air to blow moisture out from the tube.
   4.   Leave the tube to dry in room temperature.
   5.   Reattach the tube to GMP80P and the incubator sampling port and continue the measurement.

Sampling using steel pipe
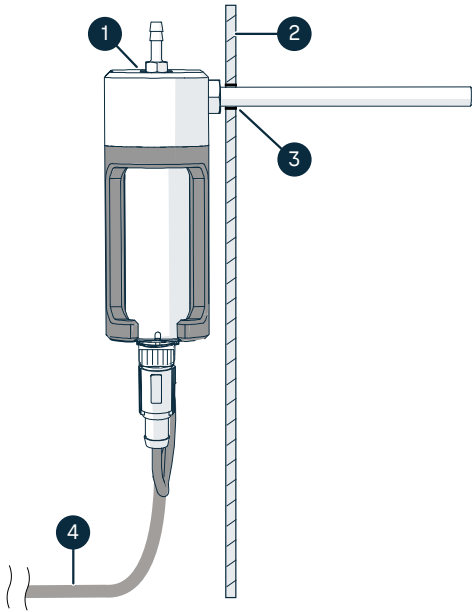
Figure 3 CO_2 sampling from incubator using pipe

1   Condensation window
2   Incubator wall
3   GMP80P sampling pipe inserted through the incubator sampling port
4   Connection cable to Indigo80

• Recommended maximum sampling time with the pipe is 15 minutes. Monitor the level of condensation through the condensation window on top of GMP80P.
• Let GMP80P dry between measurements. For example, after a sampling time of 5 minutes, 10 minutes of drying time is required.

To remove condensed water from GMP80P:

▶ 1.   Detach GMP80P from the incubator wall (do not disconnect from Indigo80).
   2.   Place GMP80P on a flat surface and leave it running, making sure it does not fall off the surface.
         You can continue measuring when there is no more condensation visible in the window on top of GMP80P.

Technical support

Contact Vaisala technical support at helpdesk@vaisala.com. Provide at least the following supporting information as applicable:

• Product name, model, and serial number
• Software/Firmware version
• Name and location of the installation site
• Name and contact information of a technical person who can provide further information on the problem

For more information, see www.vaisala.com/support.