



1-CUBE

Hamry 3567, 580 01 Havl. Brod, Czech Rep.

tel + 420 569 433 620

1-cube@1-cube.com

www.1-cube.com

At-line digital CO₂ and O₂ meter for beer and carbonated beverages, type OXI-GMD (CO₂ / O₂ GEHALTEMETER)

Application:

The digital CO₂ and O₂ meter type OXI-GMD is used to determine the content of dissolved carbon dioxide and oxygen in beer, carbonated beverages, soft drinks, and sparkling wines. Measurements can be carried out directly during the production process on production lines, in cylindroconical and pressure tanks, as well as in kegs.

The instrument is also suitable for laboratory use for determining oxygen content in beverages packaged in bottles and cans. For these measurements, in addition to the O₂ meter itself, the ICAS sampler must be used. The sampler ensures safe sampling from bottles or cans without the risk of contamination by oxygen from the ambient air.

Measurement Principle:

The instrument for determining CO₂ content operates on the principle of Henry's law. The CO₂ content is determined by measuring the temperature and the partial pressure of CO₂ in equilibrium after mechanical shaking of the beverage. A piston allows carbon dioxide to be released very quickly, eliminating the need to shake the device.

For O₂ measurement, an optical probe (electrolyte-free) is used, enabling accurate determination of dissolved oxygen in beverages. The O₂ measurement is not affected by other dissolved gases and can therefore be used for reliable monitoring of oxygen content in beverages.



Working Procedure:

The instrument's filling valve is connected, using the supplied tubing, to a sampling valve on the pipeline or to a tank in operation. The CO₂ measuring chamber is then filled with a beverage sample, while the beverage simultaneously flows through the O₂ meter measuring chamber.

The flow of the beverage through both the CO₂ measuring chamber and the O₂ meter measuring chamber can be finely and independently regulated using the drain valves, so that foam formation is prevented during filling. After selecting O₂ measurement, the measurement is started by pressing the Enter key. The measured oxygen value should be read only after it has stabilized.

Once the measuring chamber is filled, the outlet valve is closed first, followed by the inlet valve. Then the pressure in the measuring chamber is zeroed by brief opening and closing of the outlet valve. Dissolved CO₂ is released by repeatedly pulling and pressing a piston in the upper part of the measuring chamber, increasing the pressure inside the chamber.

After this preparation and selecting CO₂ measurement, the measurement is started by pressing the Enter key. The instrument automatically measures pressure and temperature, calculates the CO₂ content, and displays the resulting values in g/L and volume percent on the display.

Technical description of the O₂ meter:

- Highly sensitive optical O₂ sensor providing excellent measurement repeatability.
- The instrument is supplied with two types of O₂ sensors. The standard range is up to 10,000 ppb. Optionally, the O₂ meter can be equipped with a sensor with a range up to 2,000 ppb, which offers higher accuracy and faster response time.
- No influence from other dissolved gases.
- O₂ measurement is independent of the flow rate of the measured medium.
- User-friendly operation.
- Data Logger function: enables continuous monitoring of O₂ content from a pipeline or tank.
- Measured values can be displayed on a mobile phone equipped with a Bluetooth interface and the ArcAir software installed. The ArcAir software is available for free download from Google Play or the App Store.
- Option for independent user calibration of the O₂ sensor using a Bluetooth-enabled mobile phone with the ArcAir software installed.
- Regular calibration of the O₂ sensor zero point (0 ppb) is required at least once every six months.

Technical data:

Parameter	Values for the O ₂ meter sensor with a range of 0 to 10,000 ppb	Values for the O ₂ meter sensor with a range of 0 to 2,000 ppb
Oxygen measuring range	0 až 10 000 ppb	0 až 2 000 ppb
O ₂ Accuracy	7 ppb	1 ppb
Units O ₂	ppb, ppm	ppb, ppm
Max.temperature	70°C	70°C
Max. operating pressure	6 bar	6 bar
CO ₂ measuring range	2 to 9,99 g/l (1 to 5,15 vol)	2 to 9,99 g/l (1 to 5,15 vol)
CO ₂ Accuracy	0,1 g/l or 0,05 vol	0,1 g/l or 0,05 vol
Temperature measuring range	-3 to +30 °C	-3 to +30 °C
Pressure measuring range	0 to 600 kPa (0 to 6 bar)	0 to 600 kPa (0 to 6 bar)
Temperature measurement accuracy	0,1 °C	0,1 °C
Pressure measurement accuracy	0,5 %	0,5 %
Instrument dimensions	280 x 180 x 350 mm	280 x 180 x 350 mm
Weight	3 kg	3 kg
Protection rating (with connector cover screwed on)	IP 54	IP 54
Interface	Bluetooth	Bluetooth
Memory	200 measured values	200 measured values
Power supply	AA 1,2V NiNH rechargeable batteries - 6 pcs	AA 1,2V NiNH rechargeable batteries - 6 pcs
Charging	AC/DC adapter 24V/200mA	AC/DC adapter 24V/200mA
Display	Digital, 4x20 characters	Digital, 4x20 characters

Scope of Delivery:

Digital CO₂ and O₂ meter type OXI-GMD, filling hose made of polyurethane, silicone drain hose, charger, operating manual.

Accessories (optional):

- Sampling head for taking beverage samples from a keg
- Sampler for taking samples from packaging (bottles, cans), type ICAS

Advantages & Benefits:

- High accuracy and calibration capability: ideal for laboratories with an established ISO 9001/9002 quality system.
- Easy O₂ sensor calibration using a Bluetooth-enabled mobile phone.
- No influence from other dissolved gases on O₂ measurement.
- O₂ measurement is independent of the flow rate of the measured medium.
- The O₂ measuring chamber is equipped with a transparent window, allowing visual inspection to ensure that no CO₂ bubbles are forming on the oxygen sensor, which could affect measurement accuracy.
- Release of bound CO₂ from the beverage is ensured by a pressure shock generated by pressing the pump piston, resulting in faster and more reproducible measurement results.

- In addition to measuring CO₂ and O₂, the instrument also allows independent measurement of temperature and pressure.
- Many years of experience: we have been manufacturing CO₂ and O₂ content meters for more than 25 years and have produced thousands of units during that time. Our CO₂ and O₂ content meters are used by both large companies and small producers.
- Excellent price-to-performance ratio.

FAQ:

What are the differences between the O₂ sensors?

The O₂ sensor with a measurement range of up to **10,000 ppb** is universal and covers all common measurement needs in production environments. This versatility, however, is offset by lower measurement accuracy.

The O₂ sensor with a measurement range limited to **2,000 ppb** offers significantly higher accuracy. It is therefore intended primarily for monitoring oxygen content in the final product, where very low O₂ concentrations are present. However, the sensor with a measurement range of up to 2,000 ppb is more expensive than the sensor with a range of up to 10,000 ppb.

How often does the O₂ meter need to be calibrated?

The O₂ meter must be calibrated at least once every six months.

How often do the pressure and temperature sensors need to be calibrated?

The pressure and temperature sensors should be calibrated every two years.

What can affect the accuracy of oxygen measurement?

Measurement accuracy can be negatively affected, in particular, by using inappropriate tubing, through which oxygen may diffuse into the beverage. For example, silicone tubing is unsuitable because it is permeable to oxygen. In contrast, tubing made of polyurethane polyether is suitable, as it does not allow oxygen to pass through.

Another potential source of error is leakage between the inlet tubing and fittings, through which oxygen can enter the measured medium.

Is it possible to measure CO₂ in bottles and cans with the OXI-GMD?

No, this instrument is not suitable for measuring CO₂ in bottles or cans. The reason is the large volume of the CO₂ measuring chamber, which cannot be sufficiently filled with the beverage from a bottle or can.

Is it possible to measure O₂ in bottles and cans with the OXI-GMD?

Yes, this instrument is suitable for measuring O₂ in bottles and cans. However, for these measurements, it is necessary to use the ICAS sampler, which allows a beverage sample to be taken from a bottle or can without contamination from oxygen in the surrounding air.