

Solutions for the Beverage Industry

CO₂ | O₂ | TPO Meter Series



Driving Innovation in Gas Analysis

Inspired by two decades of experience in gas analysis, Anton Paar's intuitive, automated solutions ensure quality at every step of beverage production. The unique Multiple Volume Expansion method delivers the most precise CO₂ measurements on the market. Combined with the fast total package oxygen meter and flexible modularity, these instruments boost throughput without compromising accuracy – whether in the lab or at-line.



Reliable quality control

- Accurate results at every stage of production
- Fast total package oxygen (TPO) measurements – results in down to four minutes
- Rugged design tolerates temperatures up to 40 °C in harsh production environments
- Precise, reliable CO₂ and O₂ analysis for consistent product quality



Independent O₂ and CO₂ analysis

- Advanced technology for selective, interference-free gas measurement
- Full-range from dissolved O₂ to total package oxygen
- Highly precise CO₂ measurement via the unique Multiple Volume Expansion method
- Optochemical O₂ sensors for selective headspace and dissolved O₂ analysis

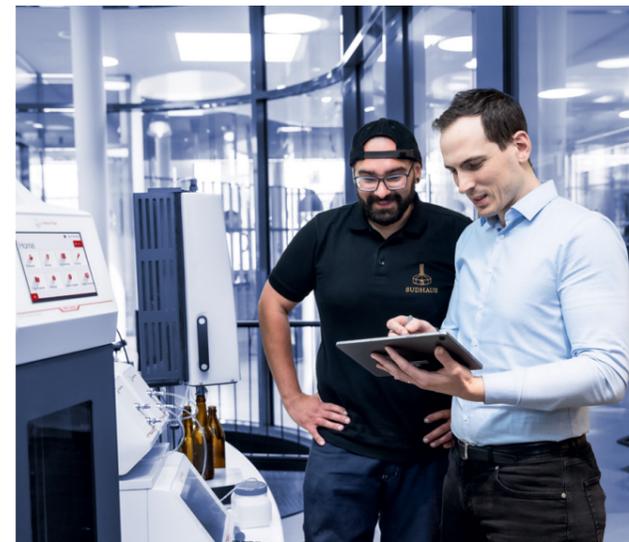


Decades of application experience

- 40+ years global expertise in beverage analysis
- Trusted by QC managers across industries worldwide
- Expert support available when and where needed
- Proven solutions for beverage production challenges

Designed for efficient workflows and easy handling

- Guided system checks and FillingCheck™ ensure accurate results from the start
- Simple sampling from any beverage container
- Integrated self-cleaning of the TPO series reduces manual effort



Expert service guaranteed

- Quality support you can count on in the long term
- Three-year warranty and a minimum of 10 years' spare parts availability
- Global service network with local-language support
- Anton Paar quality in both product and service



Paperless with AP Connect

- Centralized digital handling of lab measurement data
- Data accessible anytime from any network computer
- Streamlining of workflows for full traceability and optimal efficiency

Versatile Instruments for Multiple Industries



Total package oxygen meter: TPO 3001 | TPO 5001

- Fast, selective TPO measurement from cans, glass bottles, and PET bottles
- Results in down to four minutes
- Automated operation with self-diagnosis and error detection
- Self-cleaning design for minimal maintenance
- Option for integration into a modular system



Piercing and filling devices: PFD | PFD Plus | SFD

- CO₂ and O₂ levels remain unaffected during sample filling
- Compatible with glass bottles, PET bottles, and cans
- High safety standards with protective shield (360° with PFD Plus)
- SFD enables sampling from corked sparkling-wine bottles



Dissolved gas measuring module: CarboQC ME

- Operates as part of a measurement system for simultaneous analysis of dissolved CO₂, TPO, density, alcohol, turbidity, pH, etc.
- Expandable via Option O₂ (Plus), for simultaneous O₂ determination



Portable CO₂ meters: CarboQC | CarboQC At-line | CarboQC Craft

- Selective CO₂ measurement, unaffected by other gases
- Reliable QC, from the process line, tank, or final packages
- FillingCheck™ for automatic filling-error detection
- Storage of up to 500 results; USB data/method transfer
- Availability of dedicated craft brewer version with streamlined features



Combined CO₂ and O₂ meters: CboxQC | CboxQC At-Line | CboxQC Craft

- CO₂ and O₂ measurement at process lines, tanks, or from packaging
- Rugged IP67 design with protective rubber housing
- Up to 11 hours of battery life
- Availability of model dedicated to craft brewing with essential functions and streamlined performance



Portable dissolved O₂ meters: OxyQC | OxyQC Wide Range

- Selective O₂ measurement, unaffected by other gases
- Reliable QC for packaging and production
- Storage of up to 500 results; USB data/method transfer
- Wide-range sensor option for up to 45 ppm

Solutions that Evolve with Your Needs

Anton Paar's gas analysis solutions are designed to grow with your needs – from upscaling analytical solutions to implementing inline analysis in production.



Inline measurement and control

The inline sensor, Cobrix, reports results directly from the line. Connected via the Davis 5 software, it is automatically calibrated and adjusted, taking lab measurements as a reference.



Maximum efficiency with ALAB 5000

Fast, fully automated QC for beverage lines and labs – 24/7 operation, no manual sample prep, no downtime. ALAB 5000 Analytic analyzes key physical and chemical parameters in bulk and retail packages. ALAB 5000 Torque measures the opening torque of twist-off caps and crowns.

CarboQC/OxyQC/CboxQC: Measure CO₂, O₂, or both

Superior Performance, Guaranteed

Accurate CO₂, O₂, or combined gas measurement for at-line and lab applications.



Reliable measurements, wherever needed

At-line solutions for filling lines, tanks, bright beer tanks (BBTs), kegs, and casks ensure consistent production and effective process monitoring. In the lab, these instruments deliver precise quality control for finished products and support product development.

High precision

Fast and accurate results with outstanding repeatability can be achieved:

- CO₂: down to 0.01 g/L or 0.005 vol. (standard version)
- O₂: ±2 ppb accuracy for levels below 200 ppb

Combined CO₂ and O₂ results are available in down to 90 s.

Rugged and ready for daily use

With IP67 protection and durable rubber housing, the instruments are built for harsh environments. They offer up to 11 hours of battery life, full portability, and a compact design for flexible at-line or lab use.

Smart features for smooth operation

Measurements can begin right away with these factory-adjusted instruments. Automatic FillingCheck™ detects filling errors, while guided prompts support regular checks and system maintenance.



TPO Series

Unlock Superior Control

**The oxygen mastermind:
Fast, precise, low-
maintenance total package
oxygen measurement for
ultimate quality assurance.**



Fast, accurate, fully automated

TPO results are achieved in down to four minutes – with no time-consuming sample preparation and minimal consumables to replace. Ideal for final product QC, the TPO meter series measures headspace and dissolved oxygen in a single measurement cycle.

Built for daily use with minimal effort

Self-cleaning functionality and selective oxygen measurement ensure reliable performance without interference from other gases. The self-centering design allows quick, hassle-free handling of glass bottles, PET containers, and cans.

Modular and fully integrated

TPO 5001 comes with CO₂ measurement already integrated by design; the capabilities of TPO 3001 can be expanded anytime by combining for CO₂ measurement. The instrument seamlessly integrates into packaged beverage measurement systems – unlocking up to 50 industry-specific parameters.

Durable design for demanding environments

Crafted with stainless-steel housing, splash protection, and a glove-friendly interface, the TPO meter series is built for tough conditions. A clear status light ensures visibility and control at a glance.



Versatile, for Different Applications

	CarboQC ME	CarboQC 1001	CboxQC		
	With Option O ₂ (Plus) ¹⁾		Standard	At-line	Craft
CO₂ range	0 g/L to 12 g/L (0 vol. to 6 vol.) at 30 °C (86 °F) 0 g/L to 20 g/L (0 vol. to 10 vol.) <15 °C (59 °F)			0 g/L to 8 g/L (0 vol. to 4 vol.)	
CO₂ repeatability s.d.	0.01 g/L (0.005 vol.)	0.05 g/L (0.025 vol.)	0.01 g/L (0.005 vol.)	0.04 g/L (0.02 vol.)	0.1 g/L (0.05 vol.)
O₂ range	0 ppm to 4 ppm				
O₂ repeatability s.d.	2 ppb (in the range <200 ppb)				

	OxyQC		CarboQC		
	Trace range sensor	Wide range sensor	Standard	At-line	Craft
CO₂ range	-	-	0 g/L to 12 g/L (0 vol. to 6 vol.) at 30 °C (86 °F) 0 g/L to 20 g/L (0 vol. to 10 vol.) <15 °C (59 °F)	-	0 g/L to 8 g/L (0 vol. to 4 vol.)
CO₂ repeatability s.d.	-	-	0.01 g/L (0.005 vol.)	0.04 g/L (0.02 vol.)	0.1 g/L (0.05 vol.)
O₂ range	0 ppm to 4 ppm	0.015 ppm to 45 ppm	-	-	-
O₂ repeatability s.d.	2 ppb (in the range <200 ppb)	20 ppb (in the range <5 ppm)	-	-	-

	TPO 3001 5001 ²⁾	
	Trace range sensor	Wide range sensor
Oxygen in the gas phase	0 hPa to 45 hPa	0 hPa to 1,000 hPa
Dissolved oxygen	0 ppm to 2 ppm	0 ppm to 45 ppm
TPO repeatability, s.d.	±8 ppb or ±6 %, whichever is higher	±25 ppb or ±6 %, whichever is higher
CO₂ range³⁾	0 g/L to 8 g/L (0 vol. to 4 vol.) at 30 °C (86 °F) 0 g/L to 10 g/L (0 vol. to 5 vol.) < 15 °C (59 °F)	
CO₂ repeatability s.d.³⁾	0.01 g/L (0.005 vol.)	

1) Must be integrated in a Packaged Beverage Measurement System.
 2) For information about typical sample types, refer to the most recent instruction manual.
 3) CO₂ specification applies only to TPO 5001, or to TPO 3001 units upgraded with CO₂ functionality.

Quality and consumer satisfaction
 Accurate gas measurement ensures consistent taste, texture, and sensory experience in beverages.

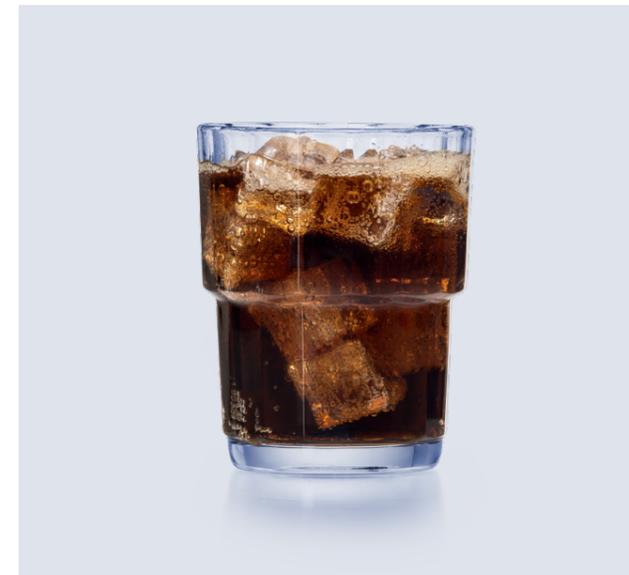
Consistent carbonation
 Precise CO₂ control delivers the expected fizziness in every bottle or can.

Longer shelf life and freshness
 Monitoring oxygen helps prevent flavor degradation and spoilage – extending product shelf life.

Can integrity and corrosion prevention
 Controlling oxygen levels protects beverage quality and prevents can corrosion or metal uptake.

Efficiency and waste reduction
 Gas level monitoring enables process optimization, reducing waste and boosting production efficiency.

Compliance and brand trust
 Reliable gas measurement ensures regulatory compliance and builds consumer and industry trust.



Recommended Configurations

Gas analysis system design,
one component at a time.

World's
best beer
analyzing
system



CboxQC

PFD (Plus)



DMA 5002

CarboQC ME and Option O₂ (Plus)

pH 3201

PFD (Plus)



DMA 6002

TPO 5001

pH 3201



DMA 5002

TPO 3001

CarboQC ME

Sample conditioner

Alcolyzer 3001 Beer with Option Color

Haze 3001

pH 3201

Portable, robust, and versatile gas meters that put you in control of critical parameters

- Reliable, selective measurement of dissolved CO₂ and DO
- FillingCheck™ for automated filling error detection
- Low sample volume required – starting from 150 mL
- Built-in system checks guidance
- Centralized data management via AP Connect system

In-spec production for soft-drink and carbonated-water portfolios in only six minutes

- Determination of the true amount of dissolved CO₂ and O₂
- No degassing prior to analysis
- Software-guided procedures
- Freeing up of lab capacity and reduction of costs related to expensive chemicals and consumables

Fast, reliable multi-parameter quality control with selective TPO and CO₂ analysis

- Filler performance and final product specification monitoring
- Measurement of 10+ industry parameters, including total package oxygen
- Data acquisition at the push of a button, with all results combined in a single data set

High-end solution for QC of beverages: Maximum operator convenience

- The most comprehensive QC system, with centralized quality control and data management
- All parameters at the push of a button, in a single dataset
- Up to 50 quality parameters from a single package

	Portable, robust and versatile gas meters: Gain control over critical parameters	In-spec production for soft-drink and carbonated-water portfolios in only six minutes	Selective TPO and CO₂ measurement with highly automatic operation and sample positioning	High-end solution for QC of beverages: Maximum operator convenience
Parameters	CO ₂ O ₂	CO ₂ O ₂ °Brix % diet pH	CO ₂ O ₂ TPO	CO ₂ O ₂ TPO extract alcohol turbidity pH
Measuring range				
Dissolved CO ₂	0 g/L to 12 g/L (0 vol. to 6 vol.) at 30 °C (86 °F) 0 g/L to 20 g/L (0 vol. to 10 vol.) < 15 °C (59 °F)	0 g/L to 12 g/L (0 vol. to 6 vol.) at 30 °C (86 °F) 0 g/L to 20 g/L (0 vol. to 10 vol.) < 15 °C (59 °F)	0 g/L to 8 g/L (0 vol. to 4 vol.) at 30 °C (86 °F) 0 g/L to 10 g/L (0 vol. to 5 vol.) < 15 °C (59 °F)	0 g/L to 12 g/L (0 vol. to 6 vol.) at 30 °C (86 °F) 0 g/L to 20 g/L (0 vol. to 10 vol.) < 15 °C (59 °F)
Dissolved O ₂	0 ppm to 4 ppm	0 ppm to 4 ppm	0 ppm to 45 ppm (wide range)	0 ppm to 2 ppm (trace range)
Oxygen in the gas phase	-	-	0 hPa to 1,000 hPa (wide range)	0 hPa to 45 hPa (trace range)
Temperature	-3 °C to +40 °C (27 °F to 104 °F)	20 °C	0 °C to 40 °C (32 °F to 104 °F) for non-frozen samples	15 °C / 20 °C (59 °F / 68 °F)
Pressure	0 bar abs. to 10 bar abs. (0 psi to 145 psi)	Up to 6.5 bar abs.	5 bar abs. to 6.2 bar abs.	5 bar abs. to 6.2 bar abs.
Density	-	0 g/cm ³ to 3 g/cm ³	-	0 g/cm ³ to 3 g/cm ³
Alcohol	-	-	-	0 % v/v to 12 % v/v
Turbidity	-	-	-	0 EBC to 100 EBC / 0 NTU to 400 NTU
Diet concentration	-	0 % to 200 % diet	-	-
Concentration sugar actual	-	0 °Brix to 15 °Brix	-	-
pH value	-	pH 0 to pH 14	-	pH 0 to pH 14
Repeatability s.d.				
Dissolved CO ₂	0.01 g/L (0.005 vol.)	0.01 g/L (0.005 vol.)	0.01 g/L (0.005 vol.)	0.01 g/L (0.005 vol.)
Dissolved O ₂	2 ppb (in the range <200 ppb)	2 ppb (in the range <200 ppb)	-	-
TPO	-	-	±25 ppb or ±6 %, whichever is higher (wide range)	±8 ppb or ±6 %, whichever is higher (trace range)
Temperature	-	0.005 °C (0.01 °F) (DMA 5002)	-	0.005 °C (0.01 °F) (DMA 5002)
Density	-	0.000003 g/cm ³ (DMA 5002)	-	0.000003 g/cm ³ (DMA 5002)
Alcohol	-	-	-	0.01 % v/v
Turbidity	-	-	-	0.3 % of the measured value + 0.02 EBC / 0.08 NTU according to formazine reference suspension
Diet concentration	-	0.5 % of measured value	-	-
Concentration sugar actual	-	0.01 °Brix (DMA 5002)	-	-
pH value	-	0.02 (in the range pH 3 to pH 7)	-	0.02 (in the range pH 3 to pH 7)
General information				
Power features	FillingCheck™, Chlorine cleaning function	U-View™, FillingCheck™, ThermoBalance™, full-range viscosity correction, ultra-fast measuring mode	FillingCheck™, System Check, guided workflows, automatic cleaning	U-View™, FillingCheck™, ThermoBalance™, full-range viscosity correction, ultra-fast measuring mode
Minimum amount of sample	100 mL	150 mL	200 mL	260 mL
Typical measuring time	1.5 min	6 min	4 min to 5 min	8 min
Typical sample throughput	Up to 40 samples per hour	Up to 10 samples per hour	Up to 15 samples per hour	Up to 7 samples per hour
Communication interfaces	1x USB, RS232 Optional: Bluetooth, RFID	5x USB, Ethernet, CAN, RS232	3x USB, Ethernet, CAN (for Anton Paar devices only), RS232	5x USB, Ethernet, CAN, RS232
Ambient temperature	0 °C to 40 °C (32 °F to 104 °F)	15 °C to 35 °C (59 °F to 95 °F)	15 °C to 35 °C (50 °F to 95 °F) 0 °C to 40 °C (32 °F to 104 °F) on request	15 °C to 35 °C (59 °F to 95 °F)
Air humidity	Non-condensing, 10 % to 95 % relative humidity	Non-condensing, 10 % to 90 % relative humidity	Non-condensing, 10 % to 90 % relative humidity	Non-condensing, 10 % to 90 % relative humidity

Trademarks: U-View (006834791), FillingCheck (006834725), ThermoBalance (006835094)



**Our well-trained and certified technicians
are ready to keep your instrument running smoothly.**

Maximum uptime | Warranty program | Short response times | Global service network

