

# Solutions for the Beverage Industry

CO<sub>2</sub> | O<sub>2</sub> | 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 CO<sub>2</sub> measurements on the market. Combined with the fastest Total Package Oxygen meter and flexible modularity, these instruments boost throughput without compromising accuracy – whether in the lab or at-line.



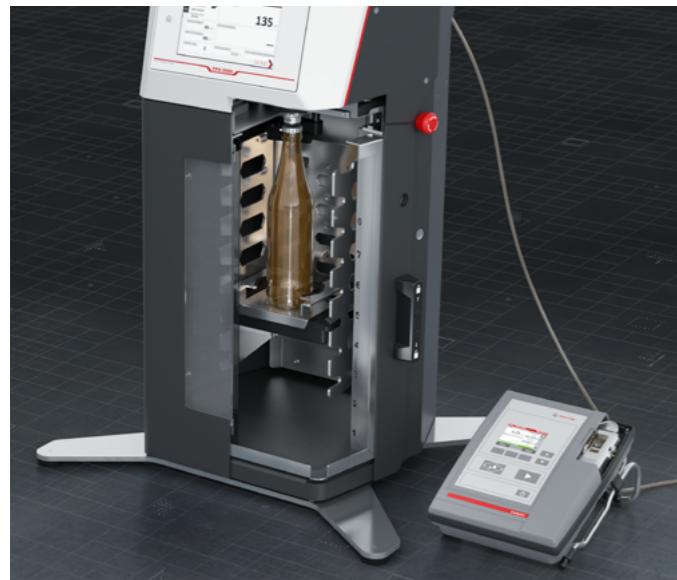
## Reliable quality control

- Accurate results at every stage of production
- Fastest 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 CO<sub>2</sub> and O<sub>2</sub> analysis for consistent quality



## Independent O<sub>2</sub> and CO<sub>2</sub> analysis

- Advanced technology for selective, interference-free gas measurement
- Full-range from dissolved O<sub>2</sub> to total package oxygen
- Highly precise CO<sub>2</sub> measurement via the unique Multiple Volume Expansion method
- Optochemical O<sub>2</sub> sensors for selective headspace and dissolved O<sub>2</sub> 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 (TPO 5000) reduces manual effort



## Expert service guaranteed

- Quality support to count on 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 5000

- 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
- Modular system with up to 50 industry-specific parameters



### Piercing and Filling Devices: PFD | PFD Plus | SFD

- CO<sub>2</sub> and O<sub>2</sub> 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 CO<sub>2</sub>, TPO, density, alcohol, turbidity, pH, etc.
- Expandable via Option O<sub>2</sub> (Plus)



### Portable CO<sub>2</sub> Meters: CarboQC | CarboQC At-line | CarboQC Craft

- Selective CO<sub>2</sub> 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 CO<sub>2</sub> & O<sub>2</sub> Meters: CboxQC | CboxQC At-Line | CboxQC Craft

- CO<sub>2</sub> and O<sub>2</sub> measurement in 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 – essential functions and streamlined performance



### Portable Dissolved O<sub>2</sub> Meters: OxyQC | OxyQC Wide Range

- Selective O<sub>2</sub> 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

## Grow Your Business

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 & control

Cobrix delivers real-time results from the line, auto-calibrated via Davis 5 using lab data. The blending, carbonation, and dosing system, Flex-Blend, optimizes recipe management for minimum product loss and reduced changeover time.



### 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 opening torque of twist-off caps and crowns.

CboxQC/CarboQC/OxyQC: Measure CO<sub>2</sub>, O<sub>2</sub>, or both

# Superior Performance, Guaranteed

Accurate CO<sub>2</sub>, O<sub>2</sub>, 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:

- CO<sub>2</sub>: down to 0.01 g/L or 0.005 vol (standard version)
- O<sub>2</sub>: ±2 ppb accuracy for levels below 200 ppb

Combined CO<sub>2</sub> and O<sub>2</sub> 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

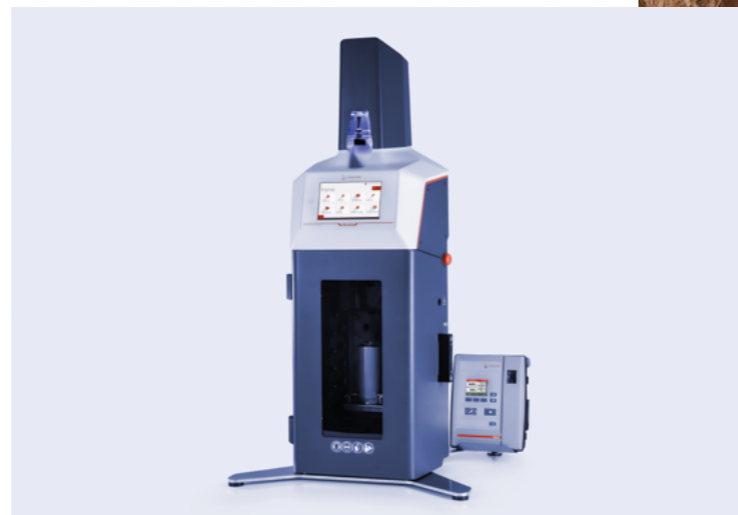
Measurements can begin right away with these factory-adjusted instruments. Automatic FillingCheck™ detects filling errors, while guided prompts support regular checks and system maintenance.



TPO 5000

# Unlock Superior Control

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



#### **Fast, accurate, fully automated**

Total package oxygen (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 5000 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**

Capabilities can be expanded by combining with CarboQC or CboxQC for simultaneous CO<sub>2</sub> 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 5000 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 <sub>2</sub> <sup>1)</sup>		Standard	At-line	Craft
<b>CO<sub>2</sub> range</b>	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.)	
<b>CO<sub>2</sub> repeatability s.d.</b>	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.)
<b>O<sub>2</sub> range</b>	0 ppm to 4 ppm				
<b>O<sub>2</sub> repeatability s.d.</b>	2 ppb (in the range <200 ppb)				

	OxyQC		CarboQC		
	Trace Range Sensor	Wide Range Sensor	Standard	At-line	Craft
<b>CO<sub>2</sub> range</b>	-	-	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.)
<b>CO<sub>2</sub> repeatability s.d.</b>	-	-	0.01 g/L (0.005 vol.)	0.04 g/L (0.02 vol.)	0.1 g/L (0.05 vol.)
<b>O<sub>2</sub> range</b>	0 ppm to 4 ppm	0.015 ppm to 45 ppm	-	-	-
<b>O<sub>2</sub> repeatability s.d.</b>	2 ppb (in the range <200 ppb)	20 ppb (in the range <5 ppm)	-	-	-

	TPO 5000 <sup>2)</sup>	
	Trace Range Sensor	Wide Range Sensor
<b>Oxygen in the gas phase</b>	0 hPa to 45 hPa	0 hPa to 1,000 hPa
<b>Dissolved oxygen</b>	0 ppm to 2 ppm	0 ppm to 45 ppm
<b>TPO repeatability, s.d.</b>	±8 ppb or ±6 %, whichever is higher	

1) Must be integrated in a Packaged Beverage Measurement System  
2) For information about typical sample types, refer to the most recent instruction manual

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

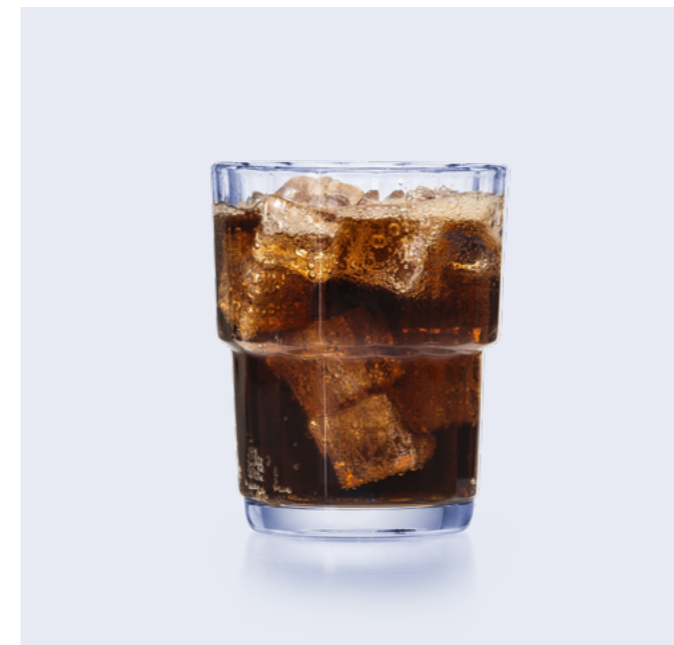
**Consistent carbonation**  
Precise CO<sub>2</sub> control delivers the expected fizziness in every bottle or can.

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

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

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

**Compliance & 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



<b>DMA 5002</b>
<b>CarboQC ME and Option O<sub>2</sub> (Plus)</b>
<b>pH 3201</b>
<b>PFD (Plus)</b>

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

- Determination of the true amount of dissolved CO<sub>2</sub> and O<sub>2</sub>
- No degassing prior to analysis
- Software-guided procedures
- Freeing up of lab capacity and reduction of costs related to expensive chemicals and consumables



<b>TPO 5000</b>
<b>CarboQC</b>

**Selective TPO and CO<sub>2</sub> measurement with highly automatic operation and sample positioning**

- Easy adaptation to all package types with simple package positioning and automatic centering
- Rugged design for long-term use
- Automatic filling into CarboQC
- O<sub>2</sub> performance verification and automatic cleaning routines



World's  
best beer  
analyzing  
system

<b>DMA 5002</b>
<b>Sample conditioner</b>
<b>Alcolyzer 3001 Beer with Option Color</b>
<b>HazeQC 3001</b>
<b>pH 3201</b>
<b>CarboQC ME</b>
<b>TPO 5000</b>

**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

	<b>In-spec production for soft drink and carbonated water portfolios in only six minutes</b>	<b>Selective TPO and CO<sub>2</sub> measurement with highly automatic operation and sample positioning</b>	<b>High-end solution for QC of beverages: maximum operator convenience</b>
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Parameters	CO <sub>2</sub>   O <sub>2</sub>   °Brix   % Diet   pH	CO <sub>2</sub>   O <sub>2</sub>   TPO	CO <sub>2</sub>   O <sub>2</sub>   TPO   extract   alcohol   turbidity   pH
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<b>Measuring range</b>			
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Dissolved CO <sub>2</sub>	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 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 <sub>2</sub>	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	20 °C	0 °C to 40 °C (32 °F to 104 °F) for non-frozen samples	15 °C / 20 °C
Pressure	Up to 6.5 bar abs.	5 to 6.2 bar abs.	5 to 6.2 bar abs.
Density	0 g/cm <sup>3</sup> to 3 g/cm <sup>3</sup>	-	0 g/cm <sup>3</sup> to 3 g/cm <sup>3</sup>
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

<b>Repeatability s.d.</b>			
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Dissolved CO <sub>2</sub>	0.01 g/L (0.005 vol.)	0.01 g/L (0.005 vol.)	0.01 g/L (0.005 vol.)
Dissolved O <sub>2</sub>	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 (DMA 5002)
Density	0.000003 g/cm <sup>3</sup> (DMA 5002)	-	0.000003 g/cm <sup>3</sup> (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)

<b>General information</b>			
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Power features	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 per measurement	150 mL	200 mL	260 mL
Typical measuring time per sample	6 min	4 min to 5 min	8 min
Typical sample throughput	Up to 10 samples per hour	Up to 15 samples per hour	Up to 7 samples per hour
Internal storage	Up to 10,000 measuring values with camera images	Up to 5,000 measuring values	Up to 10,000 measuring values with camera images
Communication interfaces	5 x USB, Ethernet, CAN, RS232	3 x USB, Ethernet, CAN (for Anton Paar devices only), RS232	5 x USB, Ethernet, CAN, RS232
Ambient temperature	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 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



