

# Lab and At-Line CO<sub>2</sub>/O<sub>2</sub> Meters and a TPO Meter **for the Beverage Industry**

CO<sub>2</sub> | O<sub>2</sub> | TPO Meter Series



# Driving Innovation in Gas Analysis

When you analyze the CO<sub>2</sub> and O<sub>2</sub> content with Anton Paar gas meters, you're not just performing measurements. You're leveraging the decades of market-leading know-how that drives our innovation and ensures the instruments you use are always superior. So that you're always one step ahead of the competition.





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### Reliable quality control

- Control quality at any step in the process
- Enjoy the fastest total package oxygen meter on the market with results in approx. four minutes
- Withstand tough operating conditions of up to 40 °C during and after the production process with a rugged design
- Get fast, accurate, and reliable determination of CO<sub>2</sub> and O<sub>2</sub>

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2

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

- Analyze the full range: from dissolved O<sub>2</sub> to total package oxygen (TPO 5000)
- Get precise and selective dissolved CO<sub>2</sub> measurements in around 55 seconds with the Multiple Volume Expansion method, which we invented
- Conduct optochemical O<sub>2</sub> measurements, the worry-free method for selectively measuring headspace O<sub>2</sub> and dissolved O<sub>2</sub>
- Eliminate influence from other gases

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3

### Decades of application experience

- Know you're working with a partner that has over 40 years of experience in the field
- Draw on our application expertise wherever and whenever you need it
- Rely on the same expertise that QC managers from around the world and across every industry have access to

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4

### Usability features

- Guided system checks
- FillingCheck™ ensures quality measurement results from the start
- Hassle-free operation and sampling out of every beverage container type
- Integrated self-cleaning function minimizes cleaning efforts (TPO 5000)

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5

### Expert service, guaranteed

- Know you benefit from Anton Paar quality when it comes to durability and service
- Get a 3-year warranty with each product
- Access our global service network whenever you need it
- Enjoy support in your local language
- Know you have access to spare parts for at least 10 years after purchase

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# Leading Technology: Multiple Volume Expansion Method



We have decades of industry-leading experience providing intelligent, intuitive, and automated solutions. These solutions elevate, enhance, and ensure product quality during every step of your beverage production process.

These help you maximize sample throughput without compromising on quality.

#### **Benefit from our technology-driven curiosity**

- Use the Multiple Volume Expansion method, which we invented, for selective and most precise CO<sub>2</sub> measurements
- Enjoy the fastest and most sophisticated Total Package Oxygen meter on the market
- Get unmatched modularity in combination with packaged beverage measuring systems for up to 50 industry-specific parameters

#### **Experience versatile measuring instruments**

- Measure in the lab or at-line
- Increase efficiency with automation and compatibility with measuring systems
- Benefit from market-leading accuracy

#### **Leverage usability features**

- Use guided workflows
- Enjoy automatic cleaning (TPO 5000)
- Access convenient sampling out of beverage containers and sample points
- Ensure quality measurements from the start with integrated system checks

#### **Perform tasks quickly and easily**

- Open your favorite menu dialogs from the 7" screen using the quick access area (TPO 5000)
- Assign different user levels to prevent accidental changes
- Get system or operation alerts and see the current status of an automatic sample changer or measuring module (PBA system)

# Versatile Instruments for a Range of Industries

## Total package oxygen meter: TPO 5000

- Selectively determine total package oxygen directly out of cans, glass bottles, and PET bottles
- Get 4-minute results
- Perform highly automated measurements with built-in support for self-diagnosis and error detection
- Enjoy self-cleaning and minimal maintenance
- Open up to 50 industry-specific measurement parameters with its modularity



## Piercing and filling device: PFD / PFD Plus and SFD

- Sample filling without affecting the content of dissolved CO<sub>2</sub> and O<sub>2</sub>
- Suitable for glass bottles, cans, and PET bottles
- High operator safety standard due to protective shield
- 360° safety shield (PFD Plus)
- Sample filling out of corked sparkling wine bottles (SFD)

## Portable dissolved CO<sub>2</sub> meter: CarboQC and CarboQC At-Line

- Perform the most selective dissolved CO<sub>2</sub> measurements, uninfluenced by other dissolved gases
- Conduct reliable QC for finished packages and measurements at-line or in the lab
- Automatically detect filling errors with FillingCheck™
- Transfer data and methods via USB
- Use up to 500 measurement data sets
- Conduct straightforward at-line measurements or high precision ones in the lab



Best  
Seller



## Combined CO<sub>2</sub> and O<sub>2</sub> meter: CboxQC and CboxQC At-Line

- Measure dissolved CO<sub>2</sub> and O<sub>2</sub> from process lines, tanks, kegs, and casks at-line or in packaging
- Use in tough environments: protection class IP67 and rubber housing
- Work longer: up to 11-hour battery life
- Quickly change measurement settings with RFID interface
- Conduct straightforward at-line measurements or high-precision ones in the lab

## Portable dissolved O<sub>2</sub> meter: OxyQC and OxyQC Wide Range

- Perform selective dissolved O<sub>2</sub> measurements, uninfluenced by other dissolved gases
- Conduct reliable QC for finished packages and production steps
- Transfer data and methods via USB
- Use up to 500 measurement data sets
- Available with a wide range oxygen sensors up to 45 ppm



# Superior Performance, Guaranteed

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

## At-line solutions

- Ensure your production process remains consistent
- Monitor your process instruments effectively
- Implement solutions for filling lines, tanks, bright beer tanks (BBT), kegs, and casks

## Reliable, accurate results

Make precise, efficient measurements with great repeatability:

- CO<sub>2</sub>: 0.01 g/L or 0.005 vol. (standard version)
- O<sub>2</sub>: ±2 ppb (in the range <200 ppb)

## Solutions for the lab

- Conduct reliable QC on finished packages
- Perform accurate measurements for product development

## Durable instruments for tough conditions

- Get an 11-hour battery life (portable recharging capability)
- Use the IP67 leak-proof instruments in harsh environments
- Enjoy a compact, lightweight, and portable design

## Quick CO<sub>2</sub> and O<sub>2</sub> results

- Get O<sub>2</sub> results in 50 seconds and CO<sub>2</sub> results in 55 seconds
- See your combined CO<sub>2</sub> and O<sub>2</sub> measurement results in just 90 seconds

## Guided features for peace of mind

- Start measuring immediately: Instruments are factory-adjusted from the start
- Rely on FillingCheck™ to automatically detect filling errors
- Leverage features that guide you through recommended system checks and support your work

	CarboQC ME*	CarboQC 1001*	CboxQC	
	(with Option O <sub>2</sub> )		Standard	At-line
CO <sub>2</sub> 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 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)	
CO <sub>2</sub> 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.)
O <sub>2</sub> range	0 ppm to 4 ppm		0 ppm to 4 ppm	
O <sub>2</sub> repeatability s.d.	2 ppb (in the range <200 ppb)		2 ppb (in the range <200 ppb)	

\* Must be integrated in a packaged beverage measuring system

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

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[www.anton-paar.com/apb-gas-co2-o2](http://www.anton-paar.com/apb-gas-co2-o2)



# Unlock Superior Control

## TPO 5000: The oxygen mastermind

### Efficient, accurate, fast

- Get TPO results in less than four minutes
- No more time-consuming sample preparation
- Total package oxygen content in one measurement
- Essential for QC in finished beverages
- No need to regularly replace consumables

### Low maintenance

- Automatic self-cleaning
- Selective measurements of headspace oxygen and dissolved oxygen not influenced by other gases

### Convenient and easy to use

- Self-centering function facilitates easy positioning of commonly used beverage containers
- Hassle-free measuring experience with glass, PET bottles, and even cans with wide sample containers

### Modular integration

- Integrates with our CarboQC CO<sub>2</sub> meter or CboxQC combined CO<sub>2</sub> and O<sub>2</sub> meter so you can measure dissolved CO<sub>2</sub> during the same cycle
- Integrates with packaged beer measuring systems (PBA) and opens up to 50 industry-specific parameters

### Durability, guaranteed

- Ready for harsh process environments
- Solid, stainless steel housing, splash-proof, and glove-friendly
- Visible status light



	TPO 5000	
	Trace Range Sensor	Wide Range Sensor
Oxygen in the gas phase	0 hPa to 45 hPa	0 hPa to 1000 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

For information about typical sample types, refer to the most recent instruction manual.

FIND OUT MORE



[www.anton-paar.com/apb-gas-tpo5000](http://www.anton-paar.com/apb-gas-tpo5000)

# The Dream Experience

You've long wanted a smart and intuitive instrument that guides your workflow and enhances your productivity. Well, now you have it.

## Easy-to-use software, intuitive usability

- Industry-specific profiles
- Guided user workflows
- Intuitive user interface and 7" touchscreen

## Smart features, smart measurements

- Integrated FillingCheck™ feature automatically detects filling errors
- Self-centering function for every bottle/can type
- RFID interface recognizes measurement setting
- Set target CO<sub>2</sub> and O<sub>2</sub> margins with threshold function
- Continuous control using data logger

## Streamline your data flow

- Automatic digital transfer of measurement data
- Stores 5,000 measurements in a single digital space
- Communicates with your existing data management systems via a customizable interface





# Recommended Configurations

Design your gas analysis system, one component at a time

1

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

- DMA 4501 Diet
- + CarboQC ME and Option O<sub>2</sub> (Plus)
- + pH 3201
- + PFD (Plus)

- Determine the true amount of dissolved CO<sub>2</sub> and O<sub>2</sub>
- No degassing prior to analysis
- Software guided procedures
- Free up lab capacity and save money on costly chemicals and consumables

2

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

- TPO 5000
- + CarboQC

- Easily adapt 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

3

**High-end solution for QC of beverages and maximum operator convenience**

- DMA 5001
- + Sample conditioner
- + Alcoalyzer 3001 Beer with option Color
- + HazeQC 3001
- + pH 3201
- + CarboQC ME
- + TPO 5000

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

MANY MORE CONFIGURATIONS



[www.anton-paar.com/apb-gas-modulyzer](http://www.anton-paar.com/apb-gas-modulyzer)



World's best beer analyzing system

# Versatile, for Different Applications

## 1 Quality and consumer satisfaction

Precise measurement of dissolved gases is a crucial aspect due to its impact on the taste, texture, and overall sensory experience of beverages. By accurately measuring the gases, the desired levels can be upheld, guaranteeing the expected taste and experience.

## 2 Precise consistency and carbonation

Carbonation is a defining characteristic of many beverages, and precise control of CO<sub>2</sub> levels ensures that each bottle or can delivers the desired level of fizziness. Precise measuring of dissolved gases is the first step towards meeting consumer expectations.

## 3 Extending shelf life and preserving flavors

Monitoring dissolved gases, especially oxygen levels, is essential to determine the shelf life and freshness of beverages. Oxygen can have detrimental effects on the taste and quality of beverages, leading to flavor degradation and spoilage over time. Accurate measurement and control of gas levels let you extend the shelf life of the products.

## 4 Preventing corrosion and maintaining can integrity

During the production and filling process, oxygen can infiltrate the can, posing risks to both the beverage and the container itself. Elevated oxygen levels increase the likelihood of can corrosion, including perforation and metal uptake. By effectively managing dissolved gases, particularly oxygen, these risks are mitigated, safeguarding the quality and integrity of both the beverage and its packaging.

## 5 Enhancing production efficiency and waste reduction

Close monitoring of gas levels let you make process optimizations and precise adjustments based on product specifications, reducing waste and maximizing efficiency. Maintaining optimal gas levels during filling operations minimizes quality issues and product wastage, resulting in improved efficiency and resource utilization.

## 6 Regulatory compliance and risk mitigation

Accurate measurement of dissolved gases ensures compliance with regulatory standards, mitigating potential legal and reputational risks associated with non-compliant products. Adhering to these standards demonstrates a commitment to consumer safety and reinforces trust in the brand, both among consumers and regulatory bodies.



# Grow Your Business

Our gas analysis solutions are designed to grow with your needs. Whether you're integrating data management, upscaling your analytical solutions, or implementing inline analysis in your production, we've got you covered.

## Measure inline

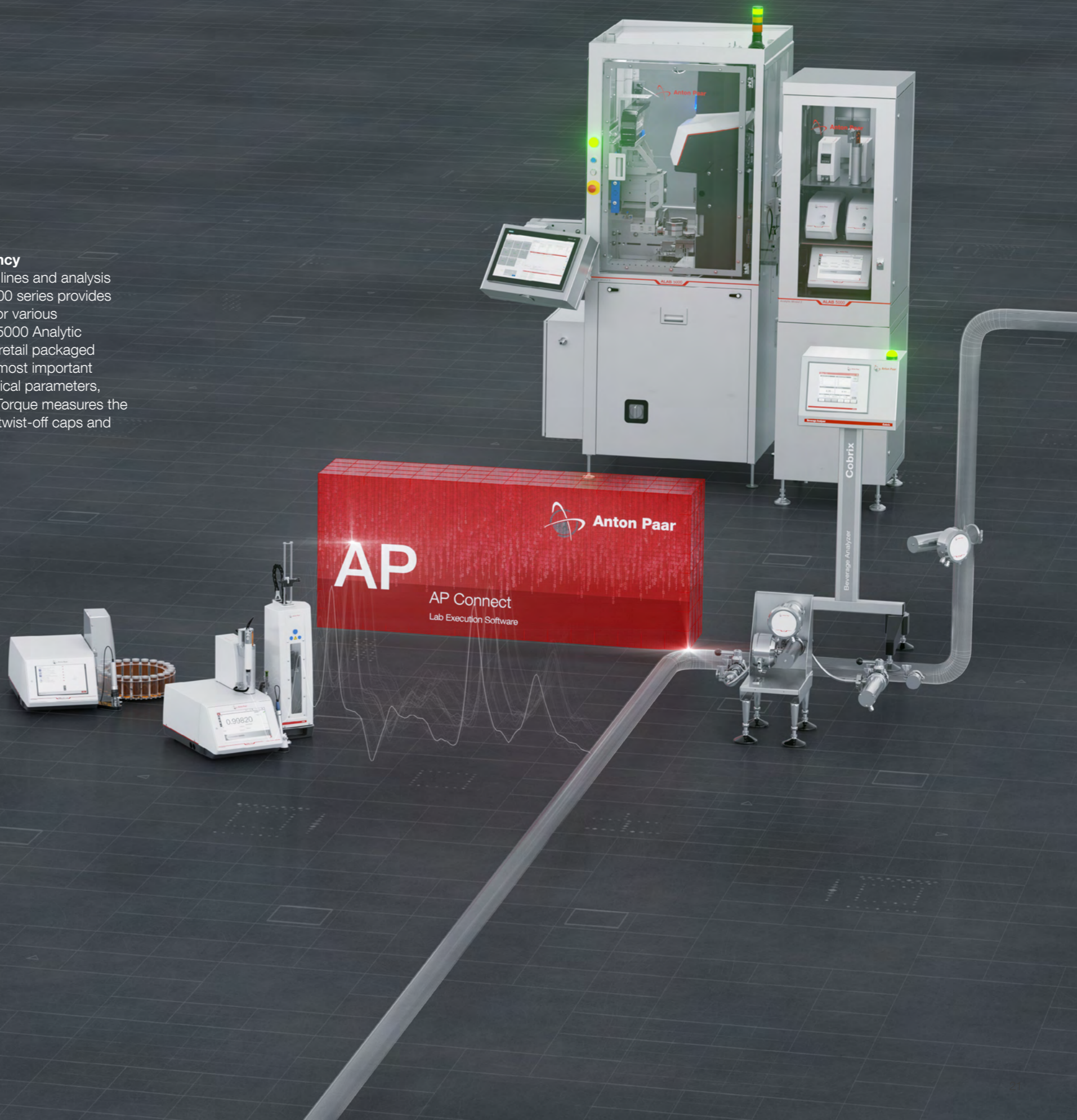
The inline sensor Cobrix reports results directly from the line. Connected via the Davis 5 software, it's automatically calibrated and adjusted, taking lab measurements as a reference. The blending, carbonation, and dosing system Flex-Blend 3000 optimizes recipe management for minimum product loss and change over time.

## Go paperless

Centralize your lab data and store all your measurements in a single digital space. With our lab execution software, AP Connect, your data is accessible from any network computer, whenever you need. Streamlining your data flow frees up time for analysis and ensures full traceability.

## Maximize efficiency

Designed for filling lines and analysis labs, the ALAB 5000 series provides quick, at-line QC for various beverages. ALAB 5000 Analytic analyzes bulk and retail packaged beverages for the most important physical and chemical parameters, while ALAB 5000 Torque measures the opening torque of twist-off caps and crowns for bottles.



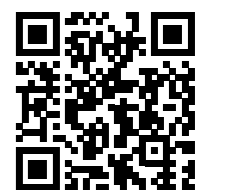
Recommended Configuration	1	2	3
Parameters	CO <sub>2</sub>   O <sub>2</sub>   °Brix   % Diet   pH	CO <sub>2</sub>   O <sub>2</sub>   TPO	CO <sub>2</sub>   O <sub>2</sub>   TPO   Extract Alcohol   Turbidity   pH
MEASURING RANGE			
Dissolved CO <sub>2</sub>	0 g/L to 12 g/L (0 vol. to 6 vol.) at 30 °C (86 °F) 0 g/L to 20 g/L (0 vol. to 10 vol.) <15 °C (59 °F)		
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 1000 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
Original extract	-	-	0 °Plato to 30 °Plato
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 <sub>2</sub>	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	0.01 °C (0.02 °F) (DMA 4501 Diet)	-	0.001 °C (DMA 5001)
Density	0.000005 g/cm <sup>3</sup> (DMA 4501 Diet)	-	0.000001 g/cm <sup>3</sup> (DMA 5001)
Alcohol	-	-	0.01 % v/v
Original extract	-	-	0.03 °Plato
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 4501 Diet)	-	-
pH value	0.02 (in the range pH 3 to pH 7)	-	0.02 (in the range pH 3 to pH 7)

Recommended Configuration	1	2	3
GENERAL INFORMATION			
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 minutes	4 to 5 minutes	8 minutes (incl. filling)
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 measurement data sets	More than 10,000 measuring values with camera images
Communication interfaces	5 x USB, Ethernet, CAN, RS232	3x 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		
Trademarks	U-View (006834791), FillingCheck (006834725), Thermobalance (006835094)		

Reliable.  
Compliant.  
**Qualified.**

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www.anton-paar.com/  
service

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



Maximum uptime



Warranty program



Short response times



A global service network

