

Solutions for Your Supreme **Soft Drinks**

Soft Drink Analysis Overview



Market-Leading Laboratory Analysis

Density measurement is crucial to ensuring the supreme quality of your soft drinks. Whether you're analyzing diet or regular soft drinks, our portfolio offers exactly what you need. Our instruments deliver market-leading analysis across the whole soft drink production process. They're always superior and position you one step ahead of the competition.





1



2



3



4



5

1

Revolutionary beverage analysis from the market leader

- Measure seven quality control parameters simultaneously in just five minutes
- Combine up to four instruments for comprehensive quality analysis, which saves you two hours of preparation and cleaning time per day
- Closely monitor processes and product release
- Use handheld devices for fast, reliable QC on-site and in the field

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2

Maximum efficiency for QC

- Reduce waste, streamline operations, and ensure consistent quality
- Get results 6x faster than with traditional methods
- Reduce diet reference analysis time by up to 75 %
- Optimize blending and carbonation, and ensure confidence in your final product
- Automate filling and cleaning of up to 24 samples in a row

WATCH VIDEO



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

WATCH VIDEO



4

Features that make market-leading density meters

- Leverage usability features like 30+ guided workflows and automatic bubble detection to make your density measurements easier than ever before
- Benefit from an automatic compensation of the thermal effects on the U-tube and keep these effects to a minimum over the entire lifetime of the instrument
- Streamline your data management with AP Connect, our lab execution software

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5

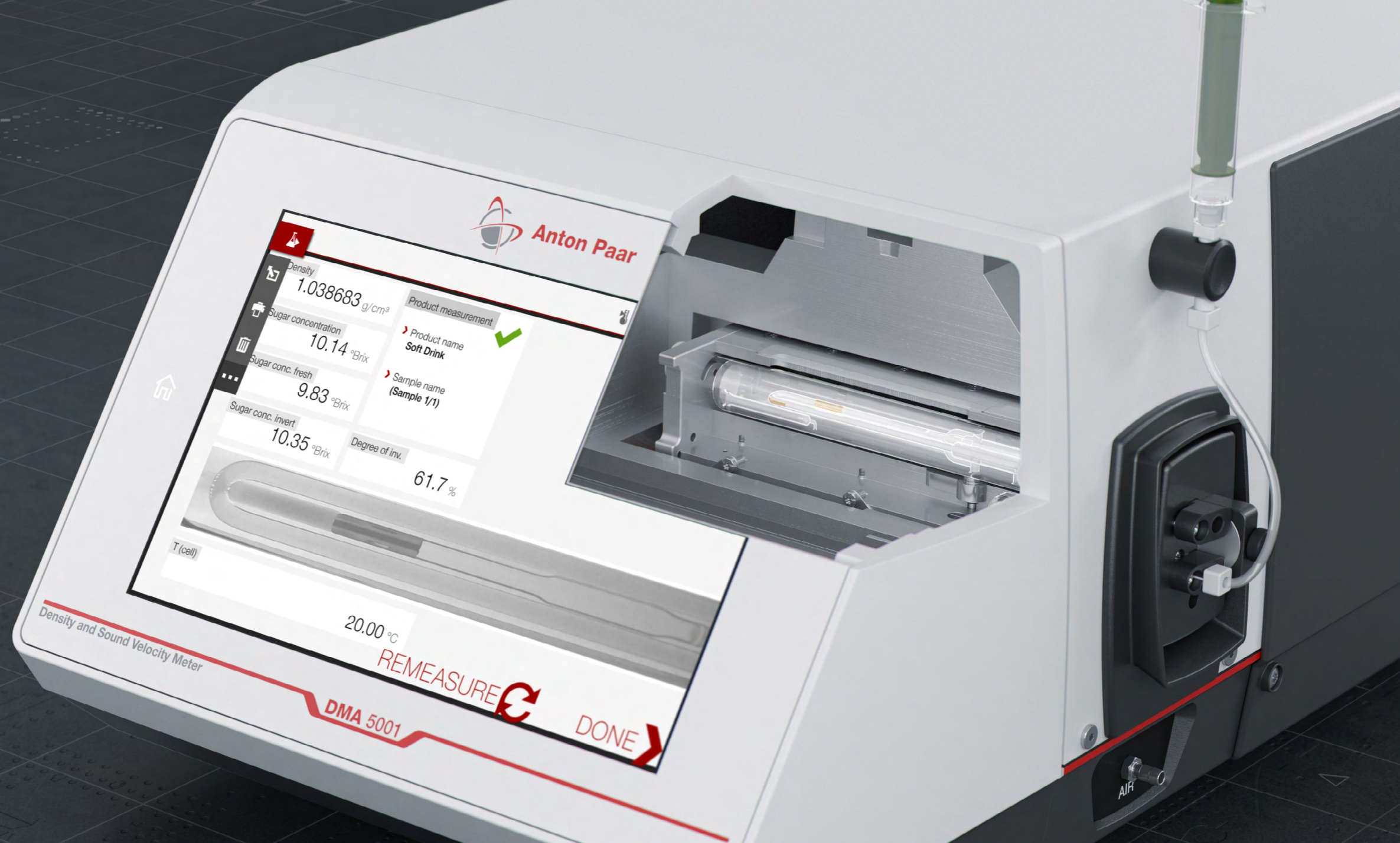
Expert service, guaranteed

- 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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The DMA: Always Superior



Density is the acknowledged standard parameter for evaluating a soft drink's quality. It's the basis for highly accurate Brix and Diet measurement, which you can obtain with our market-leading technology.

By combining sound velocity and density, you can determine the current state of the sugar inversion process, making manual inversion a thing of the past.

Enjoy market-leading accuracy

- Measure with 3- to 6-digit accuracy in density, depending on the instrument
- Know your measurements are unaffected by the surrounding environment (e.g., altitude)
- Get exceptional reproducibility every time

Stay compliant with industry standards

- Comply with all the standards you need to fulfill
- Easily pass audits and lab inspections

Get a live view of the measuring cell with U-View™

- Check the sample filling process via a high-quality image of the glass cell on the high-resolution screen (1280 x 800 px)
- Verify correct sample filling and measurements with the stored images
- Print results with or without U-View™ pictures or transfer this set of data to your LIMS systems

Perform your tasks quickly and efficiently

- Open your favorite menu dialogs from the 10.4" screen using the quick access area
- 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

Ensure correct sample filling with FillingCheck™

- Enjoy automatic monitoring of filling quality
- Get real-time error detection and automatic documentation for later verification
- Know you have the market's most reliable bubble detection with our patented Pulsed Excitation Method

Our Product Portfolio for Soft Drink Analysis

Market
Leader



DMA 35: Our portable density meter

- Conduct quick, reliable quality control during syrup production with just 2 mL of sample
- One device – replacing all glass hydrometers and pycnometers in the workplace
- Leverage the widest viscosity range on the market
- Store and export 1,000+ results to a printer or PC
- Enjoy fast sample processing with an RFID interface and Bluetooth capability

DMA 501, DMA 1001: Our advanced 3- and 4-digit density meters

- Conduct quality checks at production lines and storage facilities with this stand-alone solution
- Benefit from an unmatched price-performance ratio
- Splash-proof, self-diagnosing, no ventilation-related corrosion
- Automatic conversion of density into concentration (60+ conversion tables)



DMA 4501:
Top Seller



DMA 4101, DMA 4501, DMA 5001: The fastest, most accurate modular density meters

- Track and eliminate variations in your production and achieve consistency in every batch
- Get 4-digit accurate results in 20 seconds (or up to 6-digit accuracy for even higher precision)
- Rely on technology that's been in the field for over 40 years
- Enjoy higher throughput with automated filling, measuring, and cleaning
- Connect to various Anton Paar instruments for multiparameter measurements anytime



DMA 4501 Diet: Diet measurement made easy

- Measure % Diet, °Brix, and density for regular and diet drinks, energy drinks, and carbonated water
- Reduce diet reference analysis time by 75 %
- Combine up to four instruments to determine all quality parameters in one go
- Easily manage QC with guided diet adjustments

DMA 5001 Sound Velocity: Density and sound velocity meter: The best of both worlds

- Obtain the exact state of sugar inversion and set the dilution ratio
- Measure °Brix, °Brix fresh, °Brix inverted, and the degree of inversion in one go
- Measure % Diet
- Choose from several Anton Paar instruments for multiparameter measurement systems
- Determine the product quality of your soft drink in less than five minutes



Portable Quality Control: Anywhere, Anytime

Buy online
shop.anton-paar.com

DMA 35: A portable density meter for the field

Density meters that are built to last

The DMA 35 is durable. But don't just take our word for it.

- IP54 protection class: harsh industrial and field applications are no problem
- Added rubber protection around measuring cell
- Replace all glass hydrometers in your workplace and get the expected accuracy
- Replaceable measuring cell for DIY maintenance

On-site QC just got easier

Benefit from fast, reliable QC during syrup production on-site and in the field.

- Measurements with just 2 mL of sample, no need to transfer it to a lab
- Gesture control: one-handed measurements
- Glove-friendly
- Quick result export to printer or PC for documentation and analysis
- RFID interface and Bluetooth streamline your operations and save time in the field

DMA 35

Concentration sugar (accuracy)

0.25 °Brix

Density (accuracy)

0.001 g/cm³



FIND OUT MORE



www.anton-paar.com/
apb-softdrinks-dma35

Step Up to Lab Analysis

Buy online
shop.anton-paar.com

DMA 501, DMA 1001: Compact density meters

Let's revolutionize how you use density

Our compact digital density meters will change the way you do QC. Use intuitive features that help you use the instruments right after delivery.

- Predefined output quantities for soft drink analysis
- Guided user workflows
- Condition monitoring
- Customizable screen layouts

We have your back on traceability

When you work with us, you know your results are traceable.

- FillingCheck™ and U-View™ monitor the quality of filling, deliver alerts, and store a complete image for later verification
- Data export after every measurement via network file share or USB
- Compatible with AP Connect, our lab execution software

DMA 501

Concentration sugar (accuracy)

0.25 °Brix

Density (accuracy)

0.001 g/cm³

DMA 1001

0.025 °Brix

0.0001 g/cm³



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www.anton-paar.com/
apb-softdrinks-cdma

Next-Level Speed, Next-Level Accuracy

DMA 4101, DMA 4501, DMA 5001: Our fastest, most intelligent modular density meters

The DMA: Always superior

- 4-digit accuracy in 20 seconds
- Patented Pulsed Excitation Method ensures market-leading precision, repeatability, and reproducibility
- Storage for 10,000 measurements
- Ultra-fast measurement mode boosts productivity
- Instant pass/fail QC decisions by defining limits for different samples
- Compliance with a range of industry standards
- Up to 6-digit accuracy

The power of multiparameter analysis

- Connect your instrument to various Anton Paar measuring modules for a comprehensive measurement system
- Get all relevant QC parameters from one sample
- Measure up to seven parameters at once
- Increase your efficiency, productivity, and safety with automated sample changers

Features that simplify your workflow

- FillingCheck™ detects microbubbles within seconds
- U-View™ shows a zoomable image of the measuring cell
- Automatic compensation of temperature effects thanks to Thermo Balance™
- Guided user workflows
- Compatible with AP Connect, our lab execution software

	DMA 4101	DMA 4501	DMA 5001
Concentration sugar (accuracy)	0.025 °Brix	0.015 °Brix	<0.01 °Brix
Density (accuracy)	0.0001 g/cm³	0.00005 g/cm³	0.000005 g/cm³

Diet Measurement, Made Easy

DMA 4501 Diet: Straightforward diet measurement with an all-in-one solution

Streamlined QC, better product quality

- Analyze your soft drink in just three to six minutes (depending on system configuration), over 6x faster than using traditional methods
- Measure % Diet and °Brix
- Analyze your complete soft drink portfolio: regular and mid-calorie to diet drinks, energy drinks, and carbonated water

Intuitive to use, fully customizable

- Built-in wizards guide operators through measurement and adjustment
- Wide range of preconfigured output quantities
- Compatible with AP Connect, our lab execution software
- Automated adjustment of inline sensors via Davis 5 software – no need for manual operator interaction

Upgrade for a Packaged Soft Drink Measurement System

- No operator influence with automatic pressurized filling directly from glass bottles, PET bottles, and cans
- No need for labor-intensive cleaning procedures between your product measurements
- Degassing and filtration aren't needed, saving you up to seven minutes per sample
- Experience hassle-free testing with automatic CO₂ correction and a user-friendly software-guided adjustment process, making quality control of diet products accessible to everyone

	DMA 4501 Diet
% Diet (repeatability s.d)	0.5 % Diet
Concentration sugar (accuracy)	0.01 °Brix
Density (accuracy)	0.00001 g/cm³



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FIND OUT MORE



www.anton-paar.com/apb-softdrinks-dma4501-diet

Syrup Inversion Monitoring

Density and sound velocity meter. The best of both worlds.

For products that use sucrose as a sweetener, DMA 5001 Sound Velocity determines the sugar inversion process digitally in just five minutes – no need for forced inversion. It always uses a unique and superior combination of density and sound velocity technology in a single device and is perfect for measuring sugar content in soft drinks, syrups, and HFCS.

Combine DMA 5001 Sound Velocity with a sample changer for measuring syrups and degassed samples, or use it in a multiparameter system for QC out of the final package.

One instrument handles sugar solutions in any state

- Get highly accurate results due to automated detection and compensation of a sample's viscosity
- Analyze all samples with a single instrument – from syrup to finished product

Accurate, repeatable results

- Market-leading repeatability: 0.000001 g/cm³ (density), 0.1 m/s (sound velocity)
- Get the best results on the market combined with our intelligent instrument features like U-View™
- Detect even the smallest deviations in your production with our patented Pulsed Excitation Method
- Optimize your production and receive your perfect product time and time again

Confidence in every measurement

- FillingCheck™ generates and records filling warnings for both the density and the sound velocity cells
- ThermoBalance™ temperature management eliminates drifts caused by temperature stress (requires only one adjustment at one temperature)

DMA 5001 Sound Velocity

Concentration sugar (accuracy)	<0.01 °Brix
Brix fresh (repeatability s.d.)	0.02 °Brix
Brix inverted (repeatability s.d.)	0.02 °Brix
% Diet (repeatability s.d.)	0.5 % Diet
Density (accuracy)	0.000005 g/cm ³
Sound velocity (repeatability s.d.)	0.1 m/s

FIND OUT MORE



www.anton-paar.com/apb-softdrinks-sdms



The Dream Experience

You have a dream: of an intelligent instrument that shows you the measurement way, and if you take a wrong turn, guides you straight back to the right path. A superior instrument that tells you your measurement has bubbles in it, shows you via camera image, and asks you to repeat it. An instrument that's as intuitive as a smart phone.

Usability design

The software that powers our compact and benchtop density meters, others can only dream of. It's the reason measurements are so quick and intuitive. Together with the revolutionary operating systems, it guarantees maximum usability and a smartphone-like experience with industry-specific profiles, 30+ guided user workflows, and 200+ available conversion tables.

Smart features

An instrument that smart thinks for you: efficient sample throughput, industry profile customization, fast sample diagnostics with the new, automatic algorithm-driven FillingCheck™, and reliable single measurements. The automated setup for the industry-specific user interface delivers an out-of-the-box, out-of-this-world measuring experience.

Dream data: AP Connect lab execution software

You have a dream: of a liberating paperless lab that eliminates transcription errors and guarantees data quality. You have a dream: of a lab where the data you need to pass audits is available at a snap, right at your fingertips. Just plug the instrument in to our lab execution software AP Connect for a lab without a single piece of paper. AP Connect links your instruments, communicates measurement information, and ensures compliance. Store 10,000 measurements in a single digital space, with user-defined output reports. The software is available in eight different languages.



Versatile, for Different Applications

1 Syrup and sweetener monitoring in the syrup room

As sugar undergoes inversion during soft drink production, you need to analyze density changes. Combining density and sound velocity measurements helps you determine the extent of sugar inversion and quantify the °Brix inverted (after full inversion) in the final soft drink.

2 Syrup monitoring during soft drink production

Density and sound velocity measurements help to track sugar inversion, ensuring precise syrup dosing and maintaining product quality.

3 Final syrup blending

The final syrup blending stage in soft drink production, when water, sugar, acids, color, and preservatives are combined to create the syrup, requires thorough monitoring to get the desired sweetness level. Controlling dissolved oxygen levels ensures product quality, while proper carbonation enhances taste sensations. Density measurements indicate dissolved solids concentration, while sound velocity measurements provide insights into sugar inversion and product composition.

4 Blending and carbonation

Precise dosing of CO₂ is essential to achieve desired fizziness without compromising package integrity or incurring unnecessary costs. Monitoring key parameters such as sugar concentration, the current state of the sugar inversion process, CO₂, O₂, and pH enables immediate insights into product quality, consistency, and shelf-life stability. Comprehensive QC at this stage guarantees optimal taste sensations and production efficiency.

5 Final QC

Multiparameter measurement systems provide traceable and reliable tracking of quality parameters, ensuring consistent composition across production plants. Density, sound velocity, refractive index, °Brix, turbidity, CO₂, pH, and O₂ measurements ensure high-quality products, maintaining taste and quality throughout the beverage's shelf life.



Create Your Customized Measurement System

The core of our Measurement systems?
Our always-superior density meters.

Choose from the following:

PRIMARY INSTRUMENTS

DMA 4101

DMA 4501

DMA 4501 Diet

DMA 5001

DMA 5001 Sound Velocity

FIND OUT MORE



www.anton-paar.com/apb-softdrinks-analysis



SOUND VELOCITY

Included in
DMA 5001 Sound Velocity

SAMPLE CHANGER

Xsample 320

Xsample 520

REFRACTIVE INDEX

Abbemat 500

pH

pH 3101

pH 3201

CO₂, O₂

CarboQC ME

Option O₂ for
CarboQC ME

Option O₂ Plus for
CarboQC ME

FILLING DEVICE

PFD

PFD Plus

AVAILABLE OPTIONS

Measurement System Modular Extensions



SOUND VELOCITY

1

- Measure sugar inversion effortlessly
- No manual or forced inversion required

The DMA 5001 Sound Velocity features sugar inversion analysis through the simultaneous measurement of density and sound velocity, allowing for precise monitoring and optimization of beverage composition. This makes DMA 5001 Sound Velocity the all-in-one soft drink analyzer for your needs.

CO₂, O₂

2

- Achieve precise measurements of dissolved CO₂ in soft drinks
- No influence by other dissolved gases

Get a repeatability of 0.005 vol. Rely on automatic filling error detection for the density and CO₂ measuring cell for error-free operation. Add the (optional) high-resolution optochemical oxygen sensor for the simultaneous determination of the O₂ concentration in your beverage.

pH

3

- Simultaneous pH measurement optimized for beverage analysis
- Automatic pH value correction for impact of dissolved CO₂

Determine pH alongside other quality parameters. With the pH 3101 and pH 3201 measuring modules, you can select between pressurized and non-pressurized analysis solutions. Measure either directly from the package or from degassed samples.

SAMPLE CHANGER

4

- Eliminate handling errors and save time with automation
- Reduce costs per measurement

Benefit from a range of automation options. Suitable for syrup, intermediate products, finished products, and low and high sample throughputs. We have an automated solution to fit your business.

REFRACTIVE INDEX

5

- Receive your °Brix values based on refractive index simultaneously
- Comply with requirements related to method of analysis

Derive your °Brix values according to the required method. Depending on regulations, it's either required to report your °Brix based on density or on RI. Be prepared for both cases with simultaneous analysis.

FILLING DEVICE

6

- Filling from glass bottles, PET bottles, and cans
- No loss of CO₂ and O₂ due to pressurized filling

The PFD Filling Device transfers your sample directly from a closed container – either a bottle or a can – into the measuring chamber of a measuring instrument. The PFD and PFD Plus are the ideal filling devices for CO₂/O₂ meters and pressurized measurement systems.

Recommended Configurations

Design your soft drink measurement system, one component at a time

1

For syrup or non-carbonated beverages with sample changer

DMA 5001 Sound Velocity
+ pH 3101
+ Xsample 320

- Measure up to four parameters in one go in three to five minutes, 6x faster than with conventional methods
- Analyze your entire portfolio of soft drinks and ready-to-drink beverages
- Optimize your measurement processes with automated filling
- Eliminate operator influence, achieve the most precise % Diet results

2

For relevant parameters from the finished package

DMA 4501 Diet
+ CarboQC ME and Option O ₂ (Plus)
+ pH 3201
+ PFD (Plus)

- Measure up to six parameters in one go in three to six minutes
- Analyze regular and diet drinks, energy drinks, and carbonated water
- Reduce your diet reference analysis time by 75 %
- No sample preparation, no operator influence
- Upgrade and increase system efficiency with modular extensions to measure dissolved O₂ and pH

3

For diet drinks and sugar inversion from the finished package

DMA 5001 Sound Velocity
+ CarboQC ME and Option O ₂ (Plus)
+ pH 3201
+ PFD (Plus)

- Measure up to seven parameters in one go in three to five minutes
- Eliminate the need for manual sugar inversion
- Analyze regular and diet soft drinks, including sugar inversion
- Combine with modules for dissolved oxygen, pH, or turbidity to complete your system for final beverage analysis

MANY MORE CONFIGURATIONS



www.anton-paar.com/apb-softdrinks-modulyzer



Recommended configuration	1	2	3
	↓	↓	↓
Parameters	°Brix % Diet °Brix fresh °Brix inverted Degree of inversion pH	°Brix % Diet CO ₂ O ₂ pH	°Brix % Diet °Brix fresh °Brix inverted Degree of inversion CO ₂ O ₂ pH

MEASURING RANGE			
Density	0 g/cm ³ to 3 g/cm ³		
Sound velocity	1,000 m/s to 2,000 m/s	-	1,000 m/s to 2,000 m/s
Temperature	20 °C		
Operating pressure	Ambient	Up to 10 bar (for 0 °C to 50 °C)	Up to 8 bar (116 psi)
Concentration sugar actual	0 °Brix to 80 °Brix		
Concentration sugar fresh / inverted	0 °Brix to 80 °Brix	0 °Brix to 15 °Brix	
Degree of inversion	0 % to 100 %	-	0 % to 100 %
Diet concentration	0 % Diet to 200 % Diet; or 0 mL NaOH to 200 mL NaOH; or 0 g/L TA to 200 g/L TA; or 0 mg/mL H ₃ PO ₄ to 600 mg/100 mL H ₃ PO ₄		
CO₂ concentration	-	0 vol. to 6 vol. (0 g/L to 12 g/L) at 30 °C (86 °F) 0 vol. to 10 vol. (0 g/L to 20 g/L) <15 °C (59 °F)	
O₂ concentration	-	0 ppm to 4 ppm	
pH value	pH 0 to pH 14		

REPEATABILITY S.D.			
Density	0.000001 g/cm ³	0.000005 g/cm ³	0.000001 g/cm ³
Sound velocity	0.1 m/s	-	0.1 m/s
Temperature	0.001 °C (0.002 °F)	0.01 °C (0.02 °F)	0.001 °C (0.002 °F)
Concentration sugar actual	<0.01 °Brix*	0.01 °Brix	<0.01 °Brix*
Concentration sugar fresh / inverted	0.02 °Brix*	-	0.02 °Brix*
Degree of inversion	1 %	-	1 %
Diet concentration	0.5 % Diet		
CO₂ concentration	-	0.005 vol. (0.01 g/L)	
O₂ concentration	-	2 ppb (in the range <200 ppb)	
pH value	0.02 (in the range pH 3 to pH 7)		

Recommended configuration	1	2	3
	↓	↓	↓

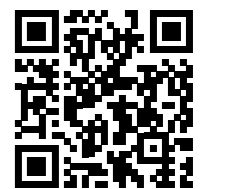
GENERAL INFORMATION	
Power features	U-View™, FillingCheck™, ThermoBalance™, full-range viscosity correction, ultra-fast measuring mode
Minimum amount of sample per measurement	40 mL 150 mL
Typical sample throughput	10 to 20 samples per hour, depending on system configuration
Internal storage	Up to 10,000 measuring values with camera images
Communication interfaces	5 x USB, Ethernet, CAN, RS232
Environmental conditions	(EN 61010) Indoor use only
Ambient temperature	15 °C to 35 °C (59 °F to 95 °F)
Air humidity	Non-condensing; 20 °C, <90 % relative humidity; 25 °C, <60 % relative humidity; 30 °C, <45 % relative humidity

Trademarks **PEM (017985525), U-View (006834791), FillingCheck (006834725), Thermobalance (006835094)**

* Up to 60 °Brix at 20 °C

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

Complete Your Soft Drink Analysis

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www.anton-paar.com/apb-softdrinks-process

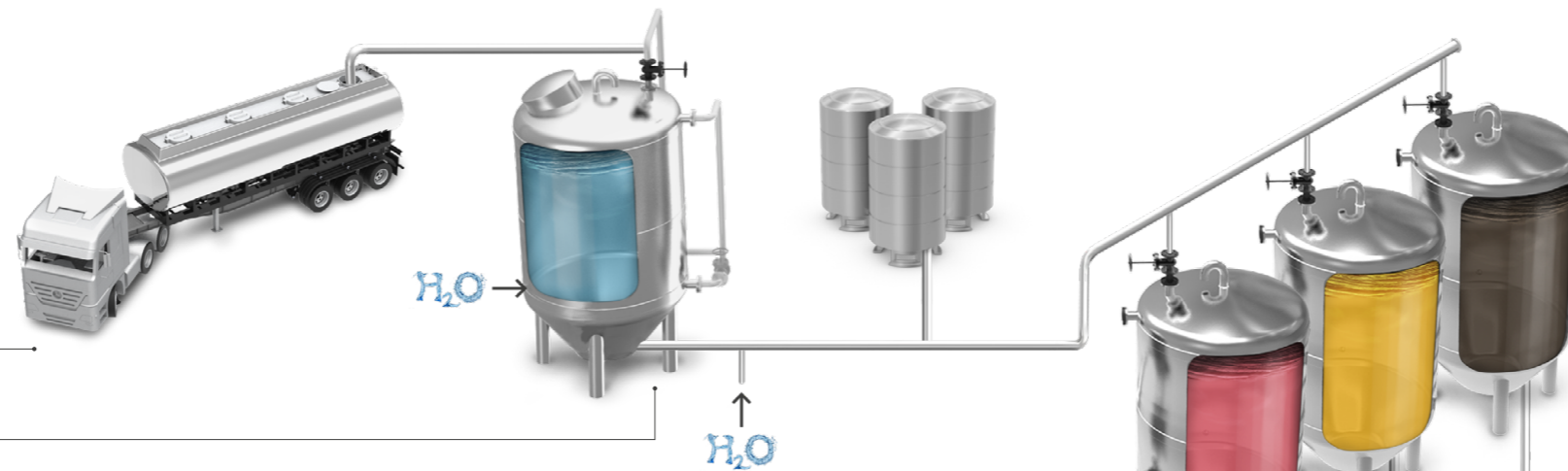
Anton Paar is the world's first full-range supplier for soft drink analysis. With 25 laboratory and process instruments, you can trace 15+ parameters from any location in the plant. Streamlining your soft drink's quality has never been so easy. Connected via the Davis 5 software, process sensors are calibrated and adjusted at the push of a button, taking lab measurements as a reference.

- Laboratory measurement (incl. portable instruments)
- Process measurement

SYRUP MONITORING

Raw Material Monitoring

Density (°Brix), refractive index, optical rotation (°Z), purity, color classification, elemental impurities



SYRUP MONITORING AND INVERSION

Raw Material Monitoring

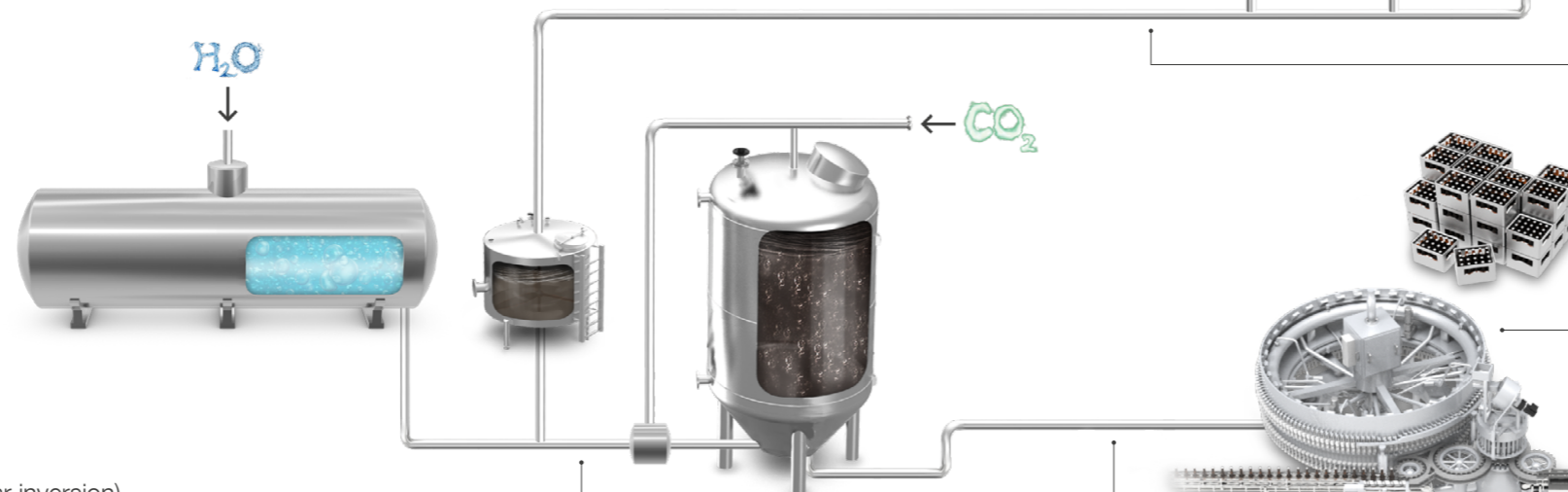
Density (°Brix), density and sound velocity (sugar inversion), refractive index



SYRUP MONITORING AND INVERSION

Sugar/Sweetener Dissolving Monitoring | Syrup Room

Density (°Brix), density and sound velocity (sugar inversion), refractive index



BLENDING AND CARBONATING

Brix Monitoring | Blending

Density (°Brix), density and sound velocity (sugar inversion), refractive index, pH



BLENDING AND CARBONATING

Soft Drink Monitoring | Blending Carbonation

Density (°Brix), density and sound velocity (sugar inversion), dissolved CO₂, dissolved O₂



FINAL QUALITY CONTROL

Soft Drink Monitoring | Pre-Filler and Final Package

Density (°Brix), density and sound velocity (sugar inversion), refractive index, diet concentration, pH, dissolved CO₂, dissolved O₂, TPO



Grow Your Business

Our soft drink 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 provides continuous measurements of °Brix, % Diet, and CO₂ during soft drink production. Connected via the Davis 5 software, it's automatically calibrated and adjusted, taking lab measurements as a reference.

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

The Flex-Blend series is a modular, inline blending, carbonating, and dosing solution that consists of autonomous, skid-mounted process modules. Based on your requirements, these modules can be integrated into your production line – no matter what kind. That's not to mention its modular structure, which gives it a compact design and small footprint.

