Anton Paar

Soft Drink Analysis
Overview

Pressurized and non-pressurized analyzing systems

Wherever You Are:
Solutions for Optimized Soft Drink Analysis

Regular quality control is the key to outstanding product quality.

Anton Paar's modular and versatile solutions for all of your production steps provide exactly what you need to accomplish your daily tasks in the most efficient way. You can rely on cutting-edge technology assembled in a smart, user-friendly system, measuring all relevant QC parameters in one single measuring cycle.

Whichever choice you make, using Anton Paar solutions simply saves you time and money.

Master instruments

Density and Sound velocity meter Soft Drink Analyzer M

to determine Brix actual, fresh, and inverted

Density meters DMA™ 4100 M DMA™ 4500 M DMA™ 5000 M

to determine Brix actual

Optional modules for each production step

For quality control on syrup, unfinished soft drinks, and sodas

Xsample™ 320 or

Xsample™ 520 sample changer for automatic analyses

For quality control in all steps of production

pH ME
to determine pH

HazeQC ME
to determine turbidity

DietQC™ ME and DietQC™ ME with option for uncolored drink
to determine diet concentration

For quality control of all kinds of finished and bottled products

PFD or PFD Plus filling devices

CarboQC ME
to determine CO_2 content

Option O_2 for CarboQC ME
to determine O_2 content

Soft Drink Analysis Throughout Production

- Analyze the fresh, actual, and fully inverted sugar content of soft drink samples within a few minutes
- No sample aging and no forced inversion required
- Get a true picture of the state of sugar inversion – by measuring a sample‘s density and sound velocity

Soft Drink Analyzer M
Master instrument for sugar analysis

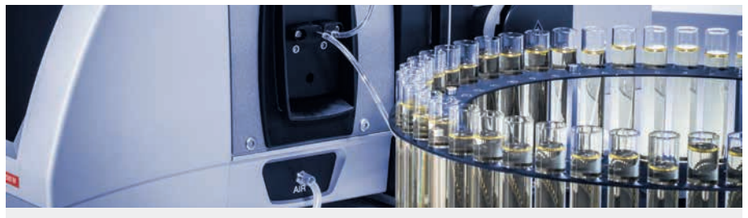
The Soft Drink Analyzer M is designed to work with semi-automatic and fully automatic Xsample™ sampling units. These Plug and Play sampling units fit into the instrument’s housing, saving you space on the lab bench.

pH ME / pH ME Beverage measuring modules

Combining a pH ME measuring module with your system of choice enables the simultaneous measurement of the pH value along with other soft drink-specific parameters. The pH ME Beverage module is designed for beverages and similar samples without pressure. Use the pH ME module for samples measured under pressure.

Sample filling unit: Xsample™ 320

The simply installed, versatile Xsample™ 320 sample filling unit saves space and is easily used with the Soft Drink Analyzer M. At the press of a button Xsample™ 320 automatically fills the sample into the measuring cells. The robust peristaltic pump makes it virtually maintenance-free.



Sample changer: Xsample™ 520

Fills sample from a 24-position sample magazine with a peristaltic pump. Xsample™ 520 takes on routine work and allows you to get on with other tasks while your samples are processed. There are five sample loading modes for bubble-free filling.

Choose your sampling unit according to the number of samples you want to measure. You can use the sample list to assign a separate method to each sample, if required. Interrupt the pre-configured sequence to insert a priority sample whenever you want. Measure large numbers of samples automatically and carry out other work while the instrument works for you.

Packaged Beverage Analysis
Final Analysis of Bottled Soft Drinks

- Save time: parallel analysis of sugar (°Brix), CO_2, and more from a single package
- Modular measuring system concept: start with the essential parameters and upgrade later
- No sample preparation required: safe pressurized filling directly from the container
- State-of-the-art control of all installed measuring modules using one 10.4” touchscreen
- One QC solution for all packages such as cans, glass bottles, and PET bottles

Master instruments for sugar analysis

The Soft Drink Analyzer M or DMA™ 4100 M | 4500 M | 5000 M are high-precision measuring instruments as well as control and evaluation units, the “masters” of your system.

%Diet, phosphate, or total acid analysis: DietQC™ ME

DietQC™ ME and DietQC™ ME with the option for uncolored drinks allow the precise concentration measurement of diet soft drinks. DietQC™ ME employs a drift-stabilized precision colorimeter equipped with a Peltier thermostat. This powerful colorimetric method (430 nm and 280 nm, respectively) is independent of fluctuations in process water composition. Repeatable diet analysis without chemicals has a name: DietQC™ ME!

CO_2 content: CarboQC ME

CarboQC ME precisely and reliably determines the dissolved CO_2 content in beverages. The patented multiple volume expansion method eliminates the influence of other dissolved gases (e.g. N_2 and O_2) on your measuring result.

O_2 content & TPO determination: Option O_2 for CarboQC ME

The optochemical oxygen sensor in the Option O_2 provides a proven and reliable way of oxygen determination. Option O_2 can also be easily retrofitted in your existing CarboQC ME.

Piercing and filling device: PFD (Plus)

The PFD filling system allows comfortable, clean and safe filling directly out of glass bottles, PET bottles, or cans without requiring any electricity. No sample preparation like degassing or filtering is needed. If you need to fill the entire sample volume from a package, you can use the PFD Plus device.

The Heart of Your Measurement

Soft Drink Analyzer M

The Soft Drink Analyzer M (SDA M) simultaneously determines density with the precision of DMA™ 5000 M – the most accurate density meter on the market – and sound velocity in the sample. These main parameters are used for the additional measurement of sugar inversion, together with a °Brix and Diet analysis based on density measurement. Whether you measure highly concentrated syrup or the finished soft drink product, the Soft Drink Analyzer M provides precise information about the true sugar content before, during, and after the inevitable inversion process. For the first time, beverages with inverting sugar can be analyzed with speed and precision, regardless of the storage time and storage temperature. Manually forced inversion is no longer required.

DMA™ M

The DMA™ M density meters measure density with an oscillating U-tube based on the patented Repeated Fade-out Method. The density is used to calculate the °Brix value in regular soft drinks. Depending on the accuracy you need, use DMA™ 4100 M, DMA™ 4500 M, or DMA™ 5000 M. With the most accurate density meter on the market, DMA™ 5000 M, you can determine the diet concentration in uncolored and turbid diet drinks.

U-View™

Check the sample filling process via a high-quality image of the glass cell on the screen or recall stored images of the entire filled-in sample at any later time. The stored images allow you to later verify correct sample filling and measurements, particularly when using automatic sampling systems. You can print results with or without U-View™ pictures or transfer this set of data to your LIMS systems as PDF files.

Ease of use

Perform your tasks quickly and efficiently. Open your favorite menu dialogs directly from the main screen using the quick access area. Assign different user levels to prevent any accidental changes. Symbols on the screen show you vital information, such as system or operation alerts and the current status of an automatic sample changer or measuring modules.

PCAP touchscreen

The 10.4” touchscreen uses projected capacitive technology (PCT/PCAP) for a state-of-the-art user experience well known from cell phones or tablets. Operation is easy, even when wearing gloves. One main screen tells you what you need to know even from a distance, thanks to adaptable font sizes.

Adaptable configurations

Integrate the flexible Soft Drink Analyzer M or DMA™ M into your lab environment without difficulty. Add a sample changer or any of the various additional measuring modules to increase the efficiency of your measuring processes. Use a mouse, bar code reader, or an external keyboard for sample identification or for work in harsh environments.

Convenient data handling

Store your results in the instrument for as long as you want and use its various interfaces for data exports via USB flash drive, printer, or Ethernet services. Reports are provided in popular formats such as PDF, TXT, and XLS. The automatic calibration of Anton Paar process equipment is also enabled with this system.

FillingCheck™

Your density meter automatically detects filling errors such as bubbles in the sample in real time, alerts you and documents the incident. You can be sure of correct sample filling, whatever the conditions.

Patented technology

The patented Repeated Fade-out Method applied by DMA™ M and SDA M delivers the most stable density results based on comprehensive knowledge of the oscillation characteristics. This method results in viscosity correction which is twice as effective as anything else available on the market.

The Packaged Beverage Analyzers

Save time – save money

The parallel analysis of several parameters, e.g. density, sound velocity, light absorption, and CO_2 from a single package allows you to downscale the analysis time to 3 to 5 minutes. QC parameters such as °Brix actual, °Brix before the start of inversion in regular soft drinks, diet concentration in diet soft drinks, and the CO_2 content are determined automatically. Additional modules, e.g. for pH, O_2, or turbidity, can be installed immediately or later on.

Fully comparable to reference methods

PBA M keeps the CO_2 dissolved via over-pressure and determines the CO_2 content while measuring density. The CO_2-corrected density value is then converted into °Brix. As a result, you receive the same Brix and CO_2 values as with the traditional method, only more reliable ones determined in a shorter time.

Less sample preparation – more reliability

PBA M systems are not only much faster, but also more reliable than previous routine analyses. Possible errors during sample preparation are completely avoided. PBA M systems are easy to use and guarantee excellent measuring results, since sample preparation is not required.

	for regular, mid-calorie soft drinks and sodas	for regular, mid-calorie soft drinks and sodas with or without invert sugar	for regular, mid-calorie soft drinks, sodas & diet soft drinks	for regular, mid-calorie soft drinks and sodas with or without invert sugar & diet soft drinks
	PBA-S	PBA-SI	PBA-SD	PBA-SID
PFD (Plus) Piercing and Filling Device	●	●	●	●
DMA™ 4100/4500/5000 M density meter | Sugar concentration: °Brix actual	●	○	●	○
Soft Drink Analyzer M | Sugar concentration: °Brix actual, fresh, inverted	○	●	○	●
CarboQC ME | CO_2 concentration: vol., g/L	●	●	●	●
DietQC™ ME | %Diet, g/L TA, mL NaOH, mg/100mL H_3PO_4, alcalinity	○	○	●	●
DietQC™ ME with option for uncolored drinks | %Diet, g/L TA, mL NaOH, mg/100mL H_3PO_4, Alcalinity	○	○	optional	optional
Option O_2 for CarboQC ME | O_2 concentration: ppb, ppm; TPO; package pressure	optional	optional	optional	optional
pH ME | pH value	optional	optional	optional	optional
HazeQC ME | Turbidity: EBC, NTU	optional	optional	optional	optional

Specifications

General Specifications for SDA M and DMA™ M

Touchscreen	10.4" TFT PCAP touchscreen 640 x 480 px
Housing material	Sealed housing Top & side cover: Aluminum, coated Back: Aluminum Front, Xsample slot cover plate: Polystyrene /Butadiene
Memory	1000 measuring values with/without camera pictures
Interfaces	4 x USB (2.0 full speed); 1 x Ethernet (100 Mbit); 1x CAN Bus; 1 x RS-232; 1 x VGA
RS-232 printer settings	Interface: RS-232 C; Baud rate: 9600; Parity: none; Stop bit: 1; Data bits: 8
Voltage	AC 100 to 240 V, 50/60 Hz
Power	190 VA (incl. Xsample and external measuring module)
Power inlet	according to IEC/EN 60320-1/C14, protection class I
Fuses	Ceramic tube fuses 5 x 20 mm; IEC60127-2; AC 250 V; T 5 AH
Environmental conditions (EN 61010)	Indoor use only
Ambient temperature	15 °C – 35 °C (59 °F – 95 °F)
Air humidity	10 % – 90 % relative humidity, non-condensing
Pollution degree	2
Overvoltage category	II
Altitude	max. 3000 m (9800 ft)

SDA M and Xsample™

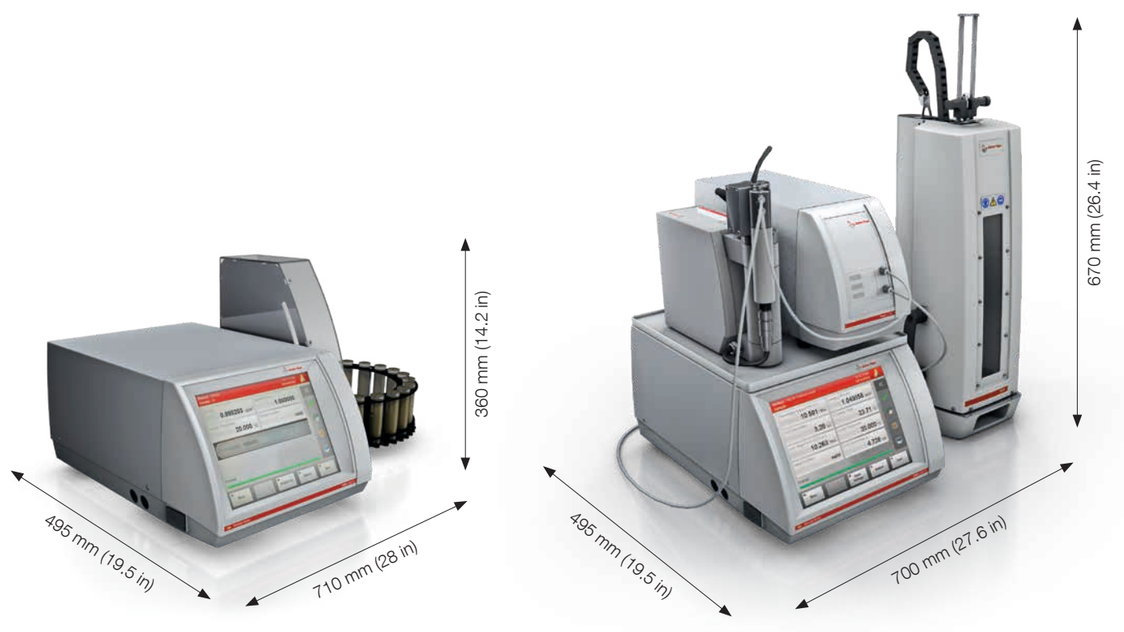
	Measuring ranges	Repeatability, s.d.
Density	0 g/cm³ to 3 g/cm³	0.000001 g/cm³*
Sound velocity	1000 m/s to 2000 m/s	0.1 m/s*
Concentration sugar actual	0 °Brix to 80 °Brix	<0.01 °Brix
Concentration sugar fresh	0 °Brix to 80 °Brix	0.02 °Brix
Concentration sugar inverted	0 °Brix to 80 °Brix	0.02 °Brix
Degree of inversion	0 % to 100 %	1 %
Temperature	20 °C	0.001 °C
pH	pH 0 to pH 14	0.02 (in the range pH 3 to pH 7)
Typical measuring time	5 minutes	
Sample volume per measurement	20 mL of degassed soft drink; 40 mL of syrup	

	Xsample™ 320	Xsample™ 520
Max. sample viscosity	3000 mPa.s**	3000 mPa.s**
Magazine	No	24 positions

* according to ISO 5725
** recommended for samples with a viscosity of up to 500 mPa.s at ambient and measuring temperature

PBA M

	Measuring ranges	Repeatability, s.d.
Density	0 g/cm³ to 3 g/cm³	DMA™ 4500 M: 0.00001 g/cm³* DMA™ 5000 M: 0.000001 g/cm³* Soft Drink Analyzer M: 0.000001 g/cm³*
Concentration sugar actual	0 °Brix to 15 °Brix	DMA™ 4500 M: 0.01 °Brix DMA™ 5000 M: <0.01 °Brix Soft Drink Analyzer M: <0.01 °Brix
Concentration sugar fresh	0 °Brix to 15 °Brix	Soft Drink Analyzer M: 0.02 °Brix
Concentration sugar inverted	0 °Brix to 15 °Brix	Soft Drink Analyzer M: 0.02 °Brix
Degree of inversion	0 % to 100 %	Soft Drink Analyzer M: 1 %
Temperature	20 °C	DMA™ 4500 M: 0.01 °C DMA™ 5000 M: 0.001 °C Soft Drink Analyzer M: 0.001 °C
Diet concentration for typical diet beverage compositions	0 % to 200 % or 0 mL NaOH to 100 mL NaOH or 0 g/L TA to 100 g/L TA	DietQC™ ME: Colored diet drinks: 0.2 % DietQC™ ME with option for uncolored drinks: Uncolored diet drinks: 0.4 % DMA™ 5000 M or Soft Drink Analyzer M: Uncolored or turbid diet drinks: 0.4 %
CO_2	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)	0.005 vol. (0.01 g/L)
O_2	0 ppm to 4 ppm	2 ppb (in the range <200 ppb)
pH	pH 0 to pH 14	0.02 (in the range pH 3 to pH 7)
Typical measuring time	3 minutes to 5 minutes	
Sample volume per measurement	120 mL to 150 mL for PBA-S/SI (add approx. 20 mL for each additional measuring module)	
Operating pressure for PBA system	6 ±0.5 bar relative (87 ±7 psi)	



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