

# Laboratory Density and Concentration Meters



**DMA™ 501**  
**DMA™ 1001**



# Are you ready? Let's measure.

The compact, robust, stand-alone density meters DMA™ 501 and DMA™ 1001 are Anton Paar's response to the latest trends and rising demands in quality control recognized across industries.

Take the next step and obtain density analytics compliant to lab standards or focus on process optimization by completing a good deal of your measurement work around the corner. We are ready.

## Your benefits when going with the market leader

Since Anton Paar introduced digital density measurement in 1967, the company's renowned DMA™ density meters based on the oscillating U-tube principle have been advanced over decades in direct response to customers' needs. We provide you with our long-term technological and application-specific expertise in the form of outstanding instruments as well as worldwide support through our network of local representatives. Our latest research findings prove that no other technology provides the stability, reliability, and independence of measured results from external influences like our new Repeated Fade-out Method. This patented method sets a new standard for professional digital density measurement.

An investment in DMA™ technology from Anton Paar is an all-round provision for highly reliable quality control of your products and increased efficiency in your production process.



**There is no such thing as a difficult sample if you choose the right density meter.**

Install the compact DMA™ 501 density and concentration meter near your production line or storage tank and see how a corner of your production or storage facilities turns into a tiny lab for doing quick checks. You can count on the instrument's reliable measuring results at any time – even if the sample characteristics are challenging.

You need a density value for pasty, inhomogeneous, sedimenting, particle-containing samples or even aerosol sprays right away? Challenge accepted!



**A density meter designed to meet relevant industry lab standards at an unmatched price.**

When you have a DMA™ 1001 density and concentration meter in your lab, you know that you have everything lab standards required by industry stipulate: a measuring accuracy in density of 0.0001 g/cm³. Not more – not less: DMA™ 1001 stands for density measurement at its purest, for an unprecedented price.

Get ready for compliance with your industry lab standards by using the most straightforward lab density meter you can get.



# Stand-alone & ready for work

## Measure density on all samples you are able to fill and remove

There is no such thing as a difficult sample if you use the right density meter. Countless different sample types are conveniently filled and measured – including those with challenging characteristics such as pasty, inhomogeneous, sedimenting, and particle-containing samples or even aerosol sprays. With an unconditional reliability, the instrument will always show you the best possible result. The viscosity influence on the result is automatically corrected.

## Full documentation and traceability of data

Identify your sample by entering its name manually via a keyboard or using a bar code reader and select a preconfigured set of measuring parameters to be determined before the measurement. Up to 5000 results as well as related potential filling warnings and camera images are stored in the instrument's memory. After defining the layout, file format, and contents of your result report, it is ready for printout or export to a PC via USB, Ethernet, or RS232 to ensure that you have a perfectly traceable documentation of your production process available later on.

## Personalize your instrument and concentrate on the essentials

DMA™ 501 and DMA™ 1001 allow you to create individual measurement display layouts with result outputs according to your needs. See all result details at a glance or only two numbers in a big font – it's your choice! Regularly used menu points are accessible via one touch on the 7" touchscreen from the main screen. For a quick exit, the home button takes you back to where you started.

## Enjoy built-in support for quick and worry-free measurements

Graphic illustrations showing standard operating procedures on the screen and shortcuts to important functions help you shorten the time required for measurements and quality control in general. Dual control principle by one operator? Sophisticated features will prove this is possible. Via U-View™ – a pin-sharp camera image of the measuring cell – you can closely observe the sample filling. Filling errors caused by inhomogeneous samples, bubbles, or particles in the filled sample are automatically detected by the FillingCheck™ feature.

## 100 % uptime and a long working life

DMA™ 501 and DMA™ 1001 provide a splash-proof front and a ventilation-free temperature control of the sample to avoid suction of contaminated air or dust into the housing and electronics. Especially when operating your instrument under challenging measurement conditions in production or storage facilities, you will benefit from the instrument's rugged design and sense of self-preservation. It will give you a warning and recommendation for required action if the environmental conditions are not in the specified ideal range.

## Eliminate external influences by applying standardized sample handling

The more you standardize your measuring procedure, the better your results will be. You fill the few milliliters required for density analysis using the newly designed syringe holder and can rely on results being completely independent of users or side effects coming from different syringe types or syringe filling volumes. For the best possible repeatability, low-viscosity samples are filled with the optional peristaltic pump.

## Specifications guaranteed: A unique, quick adjustment routine

A quick check to see whether your instrument measures according to specifications as well as an adjustment are done directly at the measuring temperature. In this way you lose no time on tempering to a reference temperature and benefit from an unparalleled measuring accuracy at the adjustment temperature. If a check fails, DMA™ 1001 even allows for a unique, quick one-point adjustment without the need to refill the deionized water after the calibration. There is no faster way to get ready for your measurement work.





# Product applications & measuring principle

DMA™ 501 and DMA™ 1001 have all relevant concentration tables and formulas for calculation of product-specific parameters installed and are ready to show you the result in the appropriate unit. DMA™ 1001 meets the requirements of lab standards in the pharmaceutical industry (e.g. European, Japanese, and US Pharmacopoeia) as well as the petroleum industry (e.g. ASTM D4052, ASTM D5002). The instruments are most frequently used in the following industries.

### DMA™ 501

The right density meter for measurement under challenging conditions

- Chemicals (concentration of acids & bases, solvents, paints & coatings)
- Pharmaceuticals (raw material used for drug production, intermediate products, ointments, creams)
- Cosmetics (shampoo, creams, toothpaste, sprays, make-up)
- Food (extract content of sauces, pastes, salad dressings, density of fats and oils)
- Beverages (syrup, blending checks in soft drink production)

### DMA™ 1001

The economical density meter designed to meet your lab standards

- Pharmaceuticals (filling volume control of sprays, density of infusions)
- Petroleum (quality control and blending checks on lubricants, fuels, crude oil, byproducts like acids)
- Chemicals (concentration of acids and bases, solvents, quality control of raw materials and final products)
- Food (density of additives, total solid and solid non-fat content of dairy products)

## A revolutionary measuring principle

The sample is introduced into a U-shaped tube made from borosilicate glass that is excited to oscillate at its characteristic frequency which is directly related to the density of the sample. After reaching a stable oscillation, the excitation is switched off and the oscillation fades out. This excitation and fade-out pattern is repeated continuously (the patented Repeated Fade-out Method). By evaluating this pattern, highly precise density results are obtained, the effects of viscosity compensated, and air bubbles or particles detected.

Instrument type	DMA™ 501	DMA™ 1001
Patents granted	AT516420 (B1)	AT516420 (B1)
Patents pending	AT517486 (A1)	AT517486 (A1)
Measuring range	Density: 0 g/cm³ to 3 g/cm³ Pressure: 0 bar to 10 bar (0 psi to 145 psi)	
	Temperature: 15 °C to 40 °C (59 °F to 104 °F)	Temperature: 15 °C to 60 °C (59 °F to 140 °F)
Accuracy	Density: 0.001 g/cm³ Temperature: 0.3 °C (0.6 °F)	Density: 0.0001 g/cm³ * Temperature: 0.05 °C (0.09 °F)
Repeatability, s.d.*	Density: 0.0002 g/cm³ Temperature: 0.1 °C (0.2 °F)	Density: 0.00005 g/cm³ Temperature: 0.02 °C (0.04 °F)
Reproducibility, s.d.**	Density: 0.0004 g/cm³	Density: 0.00007 g/cm³
U-View™	Yes	
FillingCheck™	Yes	
Full-range viscosity correction	Yes	
Minimum sample volume	Approx. 1 mL	
Output parameters	Density, Specific Gravity (SG), alcohol tables, sugar/extract tables, various acid/base tables, API functions	
Wetted parts	Borosilicate glass, PTFE	
Dimensions (L x W x H)	375 mm x 265 mm x 180 mm (14.8 in x 10.4 in x 7.0 in)	
Weight	13.5 kg (29.8 lb)	
Power supply	AC 100 to 240 V; 47 to 63 Hz; DC 24V, 3A	
Display	7 inches, TFT WVGA (800 x 480 Px); PCAP touchscreen	
Controls	Touchscreen, optional keyboard, mouse, and bar code reader	
Communication interfaces	1 x Ethernet, 3 x USB, 1 x RS232	
Internal storage	5000 measured results	
Other special functions	Integrated temperature and humidity sensor for intelligent condition monitoring Built-in pressure sensor for adjustments	
	–	Quick one-point water adjustment
Industry standards	DIN EN ISO 15212-1	
		ASTM standards D4052, D5002, D6448, D2501, D5931, D1475, D1250, D4806; DIN 51757; EN ISO 12185; EN 14214; ISO 18301; ISO 2811-3; European, Japanese, and US Pharmacopoeia
Available options & upgrades	Peristaltic pump Printers Aerosol filling adapter Filling kit for pasty samples ISO calibration Pharma Qualification Package - Smart	

\*\*under conditions according to installation requirements  
\*\*according to ISO 5725

