



Anton Paar

Modulyzer

Multiparameter Measuring Systems

:: Unique Density & Concentration Meters



The No. 1 in Accuracy: The Prime Class

The Modulyzers of the Prime Class are your basic configurations on which all others are built. A DMA 4100 M, DMA 4500 M or the most accurate density meter in the world, DMA 5000 M, is combined with one of the 6 different refractometers from the Abbemat series and equipped with an Xsample filling unit - all Plug and Play. The resulting Prime Class Modulyzer is your versatile partner in the laboratory.

Measurements with the Modulyzer are highly reproducible, precise and easy to perform. The automatic filling warning given by FillingCheck™ on the DMA Generation M density meters, the check of the filling procedure via U-View™ and the temperature management with ThermoBalance™ result in stable and reliable measuring results. The DMA Generation M density meters and Abbemat refractometers fully support requirements according to 21 CFR Part 11 and cGLP/GMP.

Depending on how you custom-tailor your Prime Class Modulyzer to suit your application, you determine the density and refractive index of up to 96 samples consecutively - even when they are aggressive or volatile.



Unlimited Possibilities: The Unlimited Class



The Modulizers of the Unlimited Class are top-league players when it comes to versatility and flexibility. To meet your measurement needs, the basic configuration (Prime Class) Modulizers can be expanded at any time with a HazeQC ME turbidity measuring module, a pH meter, an MCP polarimeter, Lovis 2000 ME viscometer or a Lovibond* colorimeter. An Unlimited Class Modulizer offers you the maximum flexibility today and tomorrow: Depending on the setup, this multiparameter measuring system** determines the density, refractive index, optical rotation, turbidity, pH, viscosity, color and calculated quality parameters of liquids.

**The Lovibond colorimeter is produced by Tintometer Ltd. Other colorimeters can be integrated on request. The colorimeter communicates via RS232 interface with the tiamo™ laboratory software.*

*** The DMA Generation M density meter, Abbat refractometer, MCP series polarimeter and colorimeter can be operated individually.*

Let the Future Come

Anton Paar measuring instruments embody precise and reproducible results. To help you keep pace with developments in your industry, be up-to-date and react flexibly, Anton Paar has developed the Modulyzers of the Prime Class and Unlimited Class. Highly accurate instruments, a wide range of sample filling units and measuring modules which can be added at a later date combine to make systems which are fit for the future.



| Density | Refractive index | Automation | Turbidity |
|------------------|-----------------------------------------------------|---------------------------------------|-----------|
| DMA Generation M | Abbemat Performance/ Performance Plus/Heavy Duty | Xsample 22/122, Xsample 52/352/452 | ○ |
| DMA Generation M | Abbemat Performance/ Performance Plus | Xsample 22/122 | ○ |
| DMA Generation M | Abbemat Performance/ Performance Plus/Heavy Duty | Xsample 352/452 | ○ |
| DMA Generation M | Abbemat Performance/ Performance Plus | Xsample 22/122 | HazeQC ME |
| DMA Generation M | Abbemat Performance/ Performance Plus | Xsample 22/122 | HazeQC ME |
| DMA Generation M | Abbemat Performance/ Performance Plus | Xsample 22/122 | ○ |
| DMA Generation M | Abbemat Performance/ Performance Plus | Xsample 22/122 | ○ |
| DMA Generation M | Abbemat Performance/ Performance Plus | Xsample 22/122 | HazeQC ME |
| DMA Generation M | Abbemat Performance/ Performance Plus | Xsample 22/122 | HazeQC ME |
| DMA Generation M | Abbemat Performance/ Performance Plus/Heavy Duty | Xsample 352/452 | ○ |
| DMA Generation M | Abbemat Performance/ Performance Plus/Heavy Duty | Xsample 352/452 | ○ |

To mention just a few modules

The six different **Abbatmat refractometers** from Anton Paar are designed for routine applications, as high-end instruments or for operation in harsh environments. With automatic temperature control and a wide range of accessories they form a successful team with the DMA Generation M density meters and can be adapted to suit every task.

The **filling units of the Xsample series** leave nothing to be desired: Reliable filling, automation (of up to 96 samples), resistance to aggressive samples, automatic cleaning and a bar code reader which reads the sample ID and changes the measuring method for you. Your life in the laboratory will be much easier, without a doubt.

The **modular circular polarimeters of the MCP series** are automatically temperature-controlled and particularly quick and easy to operate. The Toolmaster™ technology enables automatic transfer of all relevant data from the measuring cell to MCP. FillingCheck™ shows a live video of the filling process inside the sample cell for secure instrument handling and data traceability.

Whichever combination you choose: The instruments do not need a lot of space in the laboratory, can be used individually, upgraded at any time - and you can rely on the compatibility of the instruments coming from one producer.



Unlimited Class

| pH value | Viscosity | Optical rotation | Color | Controlled by |
|-----------------------------|-----------------------|-----------------------|-----------------------|------------------|
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | DMA Generation M |
| <input type="radio"/> pH ME | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | DMA Generation M |
| <input type="radio"/> | <input type="radio"/> | MCP Series | <input type="radio"/> | tiamo™ |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | DMA Generation M |
| <input type="radio"/> pH ME | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | DMA Generation M |
| <input type="radio"/> | Lovis 2000 ME | <input type="radio"/> | <input type="radio"/> | DMA Generation M |
| <input type="radio"/> pH ME | Lovis 2000 ME | <input type="radio"/> | <input type="radio"/> | DMA Generation M |
| <input type="radio"/> | Lovis 2000 ME | <input type="radio"/> | <input type="radio"/> | DMA Generation M |
| <input type="radio"/> pH ME | Lovis 2000 ME | <input type="radio"/> | <input type="radio"/> | DMA Generation M |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Lovibond PFXi | tiamo™ |
| <input type="radio"/> | <input type="radio"/> | MCP Series | Lovibond PFXi | tiamo™ |

Specifications

DMA Generation M

| | | DMA 4100 M | DMA 4500 M | DMA 5000 M |
|--------------------------|-------------|-------------------------------------|---------------------------|----------------------------|
| Measuring range | Density | | 0 to 3 g/cm ³ | |
| | Temperature | | 0 to 95 °C | |
| | Pressure | | 0 to 10 bar | |
| Accuracy | Density | 0.0001 g/cm ³ | 0.00005 g/cm ³ | 0.000005 g/cm ³ |
| | Temperature | 0.05 °C | 0.03 °C* | 0.01 °C* |
| Repeatability s.d. | Density | 0.00005 g/cm ³ | 0.00001 g/cm ³ | 0.000001 g/cm ³ |
| | Temperature | 0.02 °C | 0.01 °C | 0.001 °C |
| Communication interfaces | | 4 x USB, Ethernet, VGA, CAN, RS-232 | | |

Abbat Series

| | Abbat 300/350 Performance/ Performance Plus | Abbat 500/550 Performance/ Performance Plus | Abbat WR Heavy Duty | Abbat HP Heavy Duty |
|-----------------------------------------------------------------------------------------|---------------------------------------------------|---------------------------------------------------|------------------------|------------------------|
| Measuring range | | | | |
| Refractive index | | | | |
| Measuring range nD | 1.3 to 1.72 | 1.3 to 1.72 | 1.3 to 1.72 | 1.32 to 1.56 |
| Resolution nD | ±0.00001 | ±0.000001 | ±0.000001 | ±0.000001 |
| Accuracy nD ¹⁾ | ±0.0001 | ±0.00002 | ±0.00004 | ±0.00002 |
| Sample/prism temperature control via a built-in solid-state thermostat (Peltier) | | | | |
| Temperature range | 10 °C to 85 °C | 10 °C to 85 °C | 10 °C to 70 °C | 10 °C to 70 °C |
| Accuracy temperature probe ¹⁾ | ±0.05 °C | ±0.03 °C | ±0.03 °C | ±0.03 °C |
| Stability temperature probe ¹⁾ | ±0.002 °C | ±0.002 °C | ±0.002 °C | ±0.002 °C |

HazeQC ME

| | |
|------------------------------------------------------|-----------------------------|
| Measuring range | 0 to 100 EBC (0 to 400 NTU) |
| Repeatability s.d. | 0.02 EBC (0.08 NTU) |
| Resolution | better than 0.01 EBC or NTU |
| Measuring temperature (Peltier-thermostatted) | -5 °C to 40 °C |

pH ME

| | |
|------------------------|---------------------------------|
| Measuring range | 0 to 14 pH |
| Repeatability | 0.02 (in the range from 3 to 7) |

Lovis 2000 ME

| | | |
|------------------------|--------------------|--------------------------------------------------------------------------------------------|
| Measuring range | | |
| Parameters | Dynamic viscosity | 0.3 mPa.s to 10,000 mPa.s |
| | Inclination | 15° to 80° in 1° steps |
| | Shear rate | 0.5 s ⁻¹ to 1000 s ⁻¹ , influenced by capillary size and inclination |
| | Temperature | +5 °C to 100 °C |
| Temperature | Repeatability s.d. | 0.005 °C |
| | Accuracy | 0.02 °C |
| Inclination | Repeatability s.d. | 0.02° |
| | Accuracy | 0.1° |
| Measuring time | Resolution | 0.001 s |
| | Accuracy | 0.05 % |
| Viscosity | Repeatability s.d. | up to 0.1 % |
| | Accuracy | up to 0.5 % |

¹⁾ valid at refractometric standard conditions (T= 20 °C, λ = 589 nm, ambient temperature = 23 °C)

The Specialists

To simplify your decision, Anton Paar offers preconfigured systems which have been defined by experienced application experts specially for your industry. These systems are also flexible and can be expanded at a later date: You define your parameters, the Modulizers deliver the results you require.

Modulyzer for Chemicals



Modulyzer for Chemicals – withstands harsh environments and aggressive samples

The Modulyzer for Chemicals determines the quality parameters of dangerous and aggressive samples with minimum effort: The DMA 4100 M density meter, Abbemat WR refractometer and Xsample 122 sample changer deliver reproducible density results at 0.00005 g/cm³ accuracy from 0 °C to 95 °C on 24 samples (12 mL or 50 mL) in harsh environments, while simultaneously determining the refractive index and pH value. Chemical resistance to aggressive samples is guaranteed.

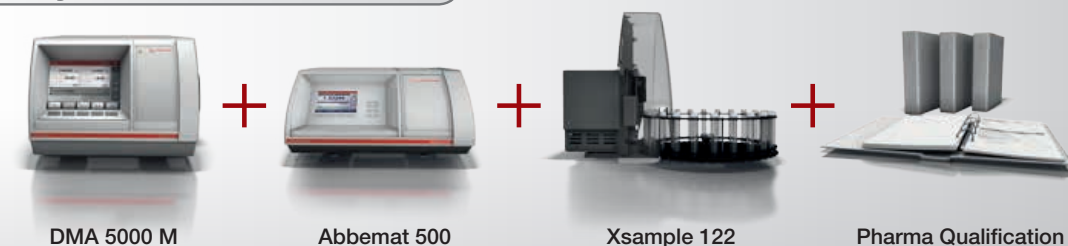
Modulyzer for Flavors & Fragrances



Modulyzer for Flavors & Fragrances – quickly analyzes valuable samples

The Modulyzer for Flavors and Fragrances ensures the quality of your products from only one sample quickly and easily: The combination of the DMA 4500 M density meter, Abbemat 300 refractometer and Xsample 452 sample changer with bar code reader fills, measures and cleans for you. Your results: density at an accuracy of 0.00005 g/cm³ and refractive index simultaneously with an accuracy of 0.0001 nD from up to 48 sample vials (12 mL or 50 mL). Samples are identified before filling using a bar code reader. Extremely efficient, and also: Valuable samples can be recovered automatically after the non-destructive analysis.

Modulyzer for Pharma



Modulyzer for Pharma – ready for the standards

Demanding regulations and social responsibility shape quality control in the pharmaceutical industry. The Modulyzer for Pharma rises to the challenge: with the most accurate density meter on the market, DMA 5000 M (0.000005 g/cm³), the most accurate Abbemat refractometer, Abbemat 500 (0.00002 nD), and the Xsample 122 sample changer (48 samples automatically). The excellent measuring results are complemented by the 4Q qualification and validation package from Anton Paar, which helps you save time, money and work while documenting the perfect fulfillment of requirements.



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Instruments for:

Density and concentration
measurement

Rheometry

Viscometry

Sample preparation

Microwave synthesis

Colloid science

X-ray structure analysis

Refractometry

Polarimetry

Petroleum testing

High-precision temperature
measurement

Specifications
subject to change
without notice