



Anton Paar

MCP 300/500 Polarimeter

Highly Accurate Measurement
of Optical Rotation

:: Superior Optical Instruments



Over 85 Years of Innovation

Anton Paar GmbH produces high-quality measuring and analysis instruments for industrial and research applications. In the fields of density and concentration measurement it is the established world leader.

Its product portfolio also includes viscometers, rheometers, saccharimeters and refractometers; and instruments for X-ray structure analysis, microwave synthesis and microwave decomposition. Throughout more than eighty-five successful years, the innovative spirit of Anton Paar's employees and their commitment to quality have been the driving forces behind the company. Openness to the requirements of customers and attention to developments in markets are the basis for new product ideas.

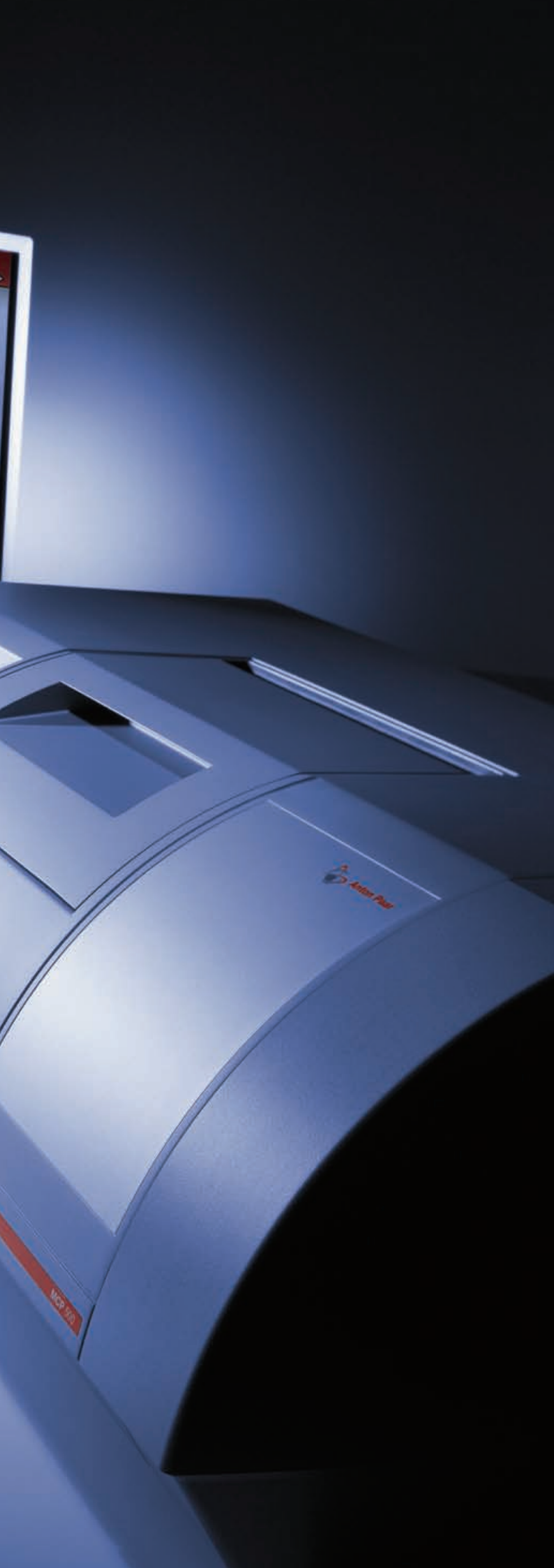
Anton Paar's strong R&D department and its partnerships with external research institutes turn these ideas into instruments at the cutting edge of technology.

MCP 300/500 – Building on 3 decades of experience

The new MCP series of polarimeters builds on a long tradition, beginning in the 1980s with the first Gyromat series developed and distributed by Dr. Kernchen GmbH.

In 2007 Dr. Kernchen became part of the Anton Paar group, which is renowned for its high-quality rheometers, refractometers, density and sound velocity meters, and research instruments for surface analysis. MCP 300/500 is the new generation of polarimeters with full compliance with international standards (pharmacopeias, OIML, ASTM).





Making Work Easier for the User

MCP 300/500 has been designed with the user in mind. The built-in software supports intuitive menu navigation and the user is guided through calibration step-by-step. There is the choice of operating the polarimeter via the touchscreen or – for operation in harsh industrial environments – via the soft keys positioned around the screen.

MCP 300/500 is easily integrated into existing LIMS systems via RS232. It also provides a CAN bus connection, VGA port, Ethernet port, and 4 USB ports for connecting a bar code reader, keyboard, mouse, printer or USB stick. Three of these USB connections are on the side of the polarimeter so it does not need to be moved when connecting external accessories.

As MCP 300/500 requires a light source to perform its measurements, it is equipped with a tungsten halogen lamp. This has a working life of around 2000 hours. Replacement is simple and requires no special knowledge of electrical engineering. As the lamp is located in a separate compartment, the instrument itself does not need to be opened. This simple replacement keeps service costs at a minimum and reduces downtime.

Customizable and easily upgradable

MCP 300/500 uses a modular concept which allows customer-specific configurations and provides the widest range of options for the future. Besides the standard 589 nm wavelength, up to seven additional wavelengths can be defined according to the applications required. Further wavelengths can be added to the polarimeter at a later date, allowing MCP 300/500 to grow to fit the tasks at hand.

Upgrade to benefit from Peltier temperature control

Demanding applications additionally require highly accurate temperature control. MCP 300/500 can be delivered with, or upgraded to, a fully automatic Peltier temperature control system which eliminates the need for a thermostatic water bath. Peltier temperature control is fast and precise. The Peltier system automatically controls the sample temperature in the range from 15 °C to 45 °C.*

* at physically standard conditions

The Highest Accuracy Over the Whole Measuring Range

Both MCP polarimeters measure Optical Rotation (OR) highly accurately over the whole range. The high-end MCP 500 provides measurements accurate to 0.002° OR. MCP 300 measures consistently to 0.003° OR.

Whether measuring the Optical Rotation, Specific Rotation or concentration, MCP 300/500 provides highly accurate results whatever the application.

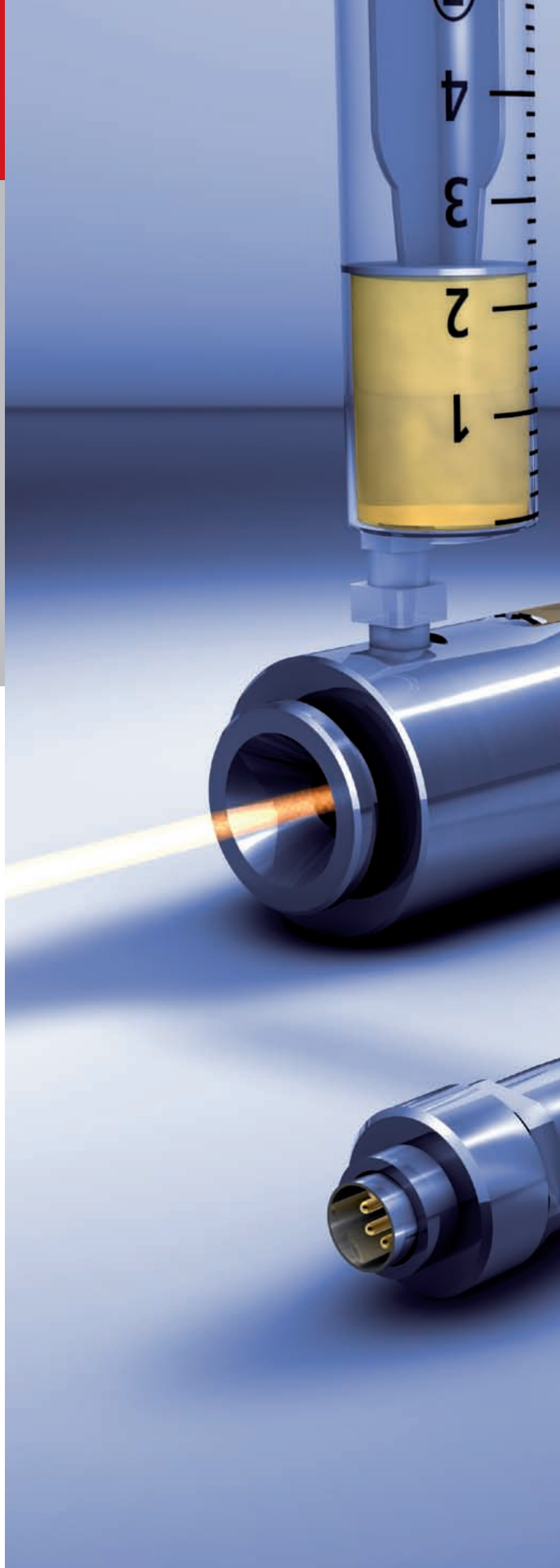
Eliminates human error

MCP 300/500 uses Anton Paar's Toolmaster™ technology to automatically transfer the data needed for adjustment and measurement. This makes MCP 300/500 the first intelligent polarimeter on the market and helps to eliminate human error during operation.

When the sample cell is changed, MCP 300/500 immediately detects the new sample cell. The Toolmaster™ memory chip transfers all relevant data from the connected sample cell into the instrument's software. Measurements are therefore clearly documented and traceable, as specified by CFR 21 Part 11.

Calibration and adjustment of the polarimeter no longer require tables and manual entry of temperature values. The Toolmaster™ memory chip on the quartz control plate contains all the relevant calibration data. After connecting the quartz control plate to MCP 300/500, all the parameters required for the adjustment procedure are automatically transferred to the instrument. This automatic data transfer minimizes operating errors. The user is lead step-by-step through the procedure on the MCP 300/500 screen. Adjustment is completed in a matter of minutes.

Quartz control plates are delivered with a manufacturer's certificate. PTB certificates are available on request.





Applications

For Research and Development and government institutions: flexible in use

Its modular concept makes MCP 300/500 extremely flexible. From routine determination of Optical Rotation and Specific Rotation to demanding measurements for innovative projects, MCP 300/500 has the right combination of sample cell and wavelength required. The polarimeter can also be upgraded with additional wavelengths and Peltier temperature control at a later date, allowing MCP 300/500 to be customized to suit any application.

MCP 300/500 provides highest accuracy over the whole measuring range. The high-end MCP 500 measures to 0.002° OR; MCP 300 measures reliably to 0.003° OR.

The Toolmaster™ technology prevents errors when exchanging sample cells and provides traceable documentation of the measurements. A memory chip on the sample cell is automatically detected by the polarimeter and all relevant data are transferred and used in the instrument's software. As the sample cell length or temperature no longer have to be entered by the operator, Toolmaster™ prevents measurements being made based on incorrect settings.

For pharmaceuticals: completely traceable documentation

The MCP polarimeters are designed to meet the exacting standards of the pharmaceuticals industry. They provide full compliance with CFR 21 Part 11, with three user levels, audit trail and forgery-proof data export. They are also compatible with QM systems and GMP/GLP.

Anton Paar's Toolmaster™ technology ensures completely traceable documentation of the measurements and calibrations. A memory chip on the sample cell and quartz control plate is automatically detected by the polarimeter and all relevant data are transferred and used in the instrument's software. As the sample cell length, temperature and the quartz control plate parameters no longer have to be entered by the operator, Toolmaster™ prevents measurements being made based on incorrect settings.

To cover all standard measurements in the pharmaceutical industry, the following additional wavelengths are available on request: 365, 405, 436, 546, 578, 880 nm.

Applications

For flavors, fragrances and essential oils: density, Refractive Index and Optical Rotation measurement from one supplier

Anton Paar is a longstanding partner of companies producing flavors, fragrances and essential oils. The powerful combination of a DMA density meter with an RXA Abbemat refractometer is found in many laboratories across the world. Alongside these instruments for determining density and refractive index, the use of polarimeters in the quality control of flavors, fragrances and essential oils is already established in official specifications. MCP 300/500 provides accuracy from very small sample volumes for quick and reliable substance characterization.

For sugar: sugar analysis, even for dark samples

The MCP polarimeters are available as special saccharimeter models: MCP Sucromat 300/500. These saccharimeters provide a measuring accuracy of ± 0.01 °Z, as specified by the official ICUMSA method GS2/3-1 "The Braunschweig Method for the Polarisation of White Sugar by Polarimetry". As sugar suppliers are paid based on the sugar content they deliver, sugar factories can optimize their profits by measuring the sugar content of the incoming crop using highly accurate saccharimeters. Additionally, MCP 500 Sucromat provides a second wavelength of 880 nm for the analysis of samples prepared without lead.

MCP 300/500 is also in use in the following industries: Food industry, starch industry and beverage industry.



Specifications



Measuring scales:	°Optical Rotation, °Specific Rotation, % Concentration (g/mL, g/100mL, g/L) % Sucrose, % Glucose, °Z International Sugar Scale, mathematic functions and user-defined scales
Optical Rotation at 589 nm	MCP 300 (MCP 500)
Measuring range:	± 89.9°
Resolution:	0.001° (0.0001°)
Accuracy:	± 0.003° * (better than ± 0.002° *)
Repeatability:	± 0.002° (better than ± 0.001°)
Response time:	12 seconds (15 seconds)
Wavelengths:	589 nm and optionally up to eight wavelengths. Standard spectral wavelengths (365, 405, 436, 546, 578, 880 nm) and customer-specific wavelengths on request.
Light source:	Tungsten halogen lamp, 6V, 20 W, with average lifetime of 2000 h
Sensitivity:	A light intensity control compensates attenuation up to Optical Density (OD) 4.0
Temperature interface	MCP 300 (MCP 500)
Sensor:	Pt 100 sensor input for sample temperature measurement
Resolution:	0.1 °C (0.01 °C)
Accuracy:	+/- 0.1°C (+/- 0.03°C) **
Temperature control: ***	Peltier system for automatic temperature control between 15 °C and 45 °C
Sample cell:	Automatic sample cell identification Sample cells from 2.5 mm to 200 mm
Display:	TFT touchscreen 6.5", 640 x 480 pixels
Interfaces:	4 USB, RS232, Ethernet, VGA, CAN bus Easy connection of keyboard, mouse, printer, bar code reader and networks
Mechanical data	MCP 300 / MCP 500
Dimensions:	754 (L) x 392 (W) x 231 (H) mm (29.7 x 15.5 x 9.1 inches)
Weight:	32 kg (70.5 lbs)
Power supply:	Self-adapting to any mains voltage AC 100 to 240 VAC, 50/60 Hz
Power consumption:	70 to 100 VA

* at physically standard conditions ** with Peltier element and "Peltier type" cell *** optional



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Instruments for:

Density & concentration
measurement

Rheometry & viscometry

Sample preparation

Microwave synthesis

Colloid science

X-ray structure analysis

Refractometry

Polarimetry

High-precision temperature
measurement



Fotos: Croce & Wir

Specifications
subject to change
without notice

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