

Modular Circular Polarimeters

MCP series



Choose one: Small but powerful

You have always made sure that your optically active substances meet all quality standards. Of course, you want to keep your promise to your customers and meet all applicable standards in a fully traceable fashion.

Regulations in your field are constantly growing and requirements keep changing. That's why most older polarimeters no longer give you the safety and traceability you need.

Anton Paar's Modular Compact Polarimeters MCP 100 and MCP 150 help you meet all requirements automatically with the latest technology – at a truly budget-friendly price and with a small size for limited space on the lab bench. MCP 100/150 is the right choice, especially for pharmaceutical applications, universities, and the flavors and fragrance industry.

MCP 100

For economic routine analysis

The instrument that fits in any laboratory and provides quick and easy operation for the analysis of chiral substances.

MCP 150

For simple analysis and full pharma compliance

The entry-level instrument for 21 CFR Part 11-compliant analysis



MCP 100/150 requires little space and fits into any laboratory. The instrument is easy to operate and you get accurate results within seconds.

An internal data memory ensures that no data is lost. The measured data can be automatically exported to a connected printer or to a server via Ethernet.

MCP 100/150 can be automatically adjusted and calibrated with Toolmaster™ quartz control plates. All relevant parameters are securely transferred to the polarimeter. The result: seamless documentation, no data input errors, and full traceability. With the Peltier temperature control, the risk of measurement errors due to inaccurate sample temperature is eliminated.

Ready to measure

Reliable

Safe

MCP 100/150 complies with all national and international pharmacopoeias. Different user hierarchies ensure that only authorized personnel operates the instrument. MCP 100/150's Audit Trail function clearly and irrevocably documents every instrument interaction as required by e.g. 21 CFR Part 11.

MCP 150 additionally offers a freely definable user group administration and an electronic signature to traceably sign the measured data. To minimize the time it takes to integrate your new MCP polarimeter into your workflow, Anton Paar offers a Pharma Qualification Package.

Proven technology – packed into a space-saving polarimeter

Anton Paar's MCP 100/150 polarimeters are equipped with the latest technology which ensures fast and reliable measurements with the most convenient operation. With their small size, MCP 100/150 polarimeters are the solution for limited space on the lab bench.



Communication unlimited

The MCP 100/150 communicates with other instruments via CAN bus. Data export is available via USB, Ethernet, and RS232 interfaces.

Fast and accurate temperature control

The powerful automatic Peltier temperature control ensures a quick and homogenous temperature distribution in the cell and the sample. This means you receive fast and accurate results.

Intelligent sample cells and quartz plates

The wireless Toolmaster™ technology saves you time and prevents errors when changing sample cells and quartz control plates. Cell and quartz plate data as well as temperature values, controlled by the Peltier temperature control, are transferred quickly and securely into the instrument. This provides traceable documentation of the measurements.

Operating convenience

The built-in color touchscreen is resistant to spillage and dirt. You can even operate the polarimeter when wearing gloves. For easy access, the USB ports are positioned on the side of the MCP 100/150 polarimeters.

Durability for a long life

The LED light source guarantees 100 000 hours of operation. All parts of the polarimeter and the sample cells are resistant to aggressive chemicals.

Choose one: Experience polarimetry without limits

The Modular Circular Polarimeters are a range of high-quality polarimeters for research and industry. They measure the optical rotation of liquids and use derived scales to determine the concentration or specific rotation of optically active substances. This ensures, for example, correct enantiomer separation and the required purity of materials. Determining the specific rotation is also part of the characterization of new optically active substances.

MCP 5100

The initiator

The entry-level instrument of Anton Paar's high-end polarimeter family: measurements of chiral substances with an accuracy of ± 0.0025 °OR, precise temperature control, and full compliance with 21 CFR Part 11.

MCP 5300

The all-rounder

The mid-range instrument of Anton Paar's high-end polarimeter family: sophisticated measurements of chiral substances with an increased accuracy of ± 0.0020 °OR, precise temperature control, and full compliance with 21 CFR Part 11.

MCP 5500

The best in class

The high-end instrument of Anton Paar's polarimeter family with a variety of built-in features and assets: highly precise measurements of chiral substances with an increased accuracy of $< \pm 0.0020$ °OR, the most precise temperature control, and full compliance with 21 CFR Part 11.

MCP 5500 MW 325

The expert for special applications

The high-end instrument of Anton Paar's polarimeter family for dedicated analysis of dextromethorphan hydrobromide according to US Pharmacopeia at 325 nm.

- FillingCheck™ to show a real-time image of the inside of the cell
- Air pump to empty and dry the sample cell
- Multiple wavelength option for up to eight different wavelengths

- Multiple wavelength option for up to eight different wavelengths

- Up to 6 additional wavelengths available optionally

Options



High-quality components – excellent accuracy

Anton Paar's MCP 5100/5300/5500 polarimeters are renowned for their modular concept. Your requirements are met – from automatic identification of sample cells and quartz control plates (Toolmaster™) to a real-time image of the inside of the cell (FillingCheck™).

The right color for your measurement

With the multiple wavelength option you are free to equip one instrument with up to eight wavelengths.

Built-in trust in the results

The FillingCheck™ camera gives you a real-time image of the sample in the cell during and after filling. Each filling process can be monitored and photographed.

Easy to navigate

The wide capacitive touchscreen display makes it simple and convenient to operate the polarimeter.



Intelligent sample cells and quartz plates

The Toolmaster™ technology saves you time and prevents errors when exchanging sample cells and quartz control plates. Cell and quartz plate data as well as temperature values are quickly and securely transferred to the instrument. This provides traceable documentation of the measurements.

Light sources with unmatched lifetime

The LED light source for each wavelength from UV and VIS to the NIR range has a lifetime of up to 100 000 hours, which minimizes instrument downtimes.

Optimal temperature conditions for accurate results

Powerful automatic Peltier temperature control ensures a quick thermal equilibrium and a homogenous temperature distribution in the sample in a wide range from 10 °C to 45 °C. This is the basis for accurate results and short measuring times.

Quick start-up after purchase

After purchase, the polarimeter is set up, qualified, and validated within a short period of time using Anton Paar's qualification and validation package.

Nothing remains hidden: Why data integrity is more important than ever

In a world of ever-evolving compliance standards and a constantly growing flood of data, particularly electronic data, the risk of involuntary or even intentional data manipulation is increasing. Data integrity plays a more and more important role, especially in pharmaceutical manufacturing and in regulated pharmaceutical laboratories. To fulfill these requirements, Anton Paar offers dedicated software solutions in combination with the MCP polarimeter:

The polarimeter is controlled by the external MCP Desktop Software. System, user group, and data administration are performed by the computer, not by the instrument, so the time to qualify the instrument is decreased immensely. Lifetime data (measured data, audit trail, checks, and adjustments) is automatically stored as raw data in the desktop database. This database can be backed up and restored on demand by standard IT processes.

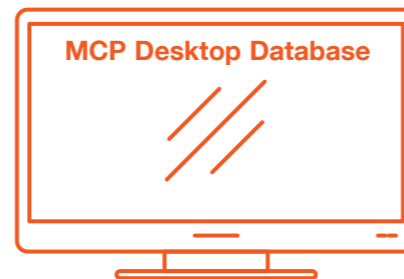
for effortless PC-controlled use

Your benefits

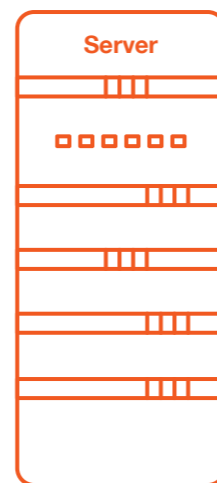
- One software for all data processing of your instrument
- Automatic data storage in the MCP Desktop Software database
- No direct instrument connection to network or server necessary
- No risk of data loss in case of instrument breakdown
- Availability of all raw data for back-up and restoring processes
- Export of data in proprietary data format, encrypted and digitally signed
- No risk of manipulation of original data
- Raw data accessibility for long retention periods
- Availability of data in machine-readable and human-readable format



Ethernet ↔ system control



Data back-up ↔ Data restore



for traceable data regeneration

The MCP polarimeter is connected to your network or PC via Anton Paar LIMS Bridge to collect or administrate all your data.

The Anton Paar Raw Data Viewer provides the plausibility check, meaning that archived raw data can be loaded and regenerated from machine-readable to human-readable format for the verification process. The data is available over the entire retention period, with or without the polarimeter. Automatic checks verify the integrity of digitally signed data – in case of changes the file verification will be rejected.

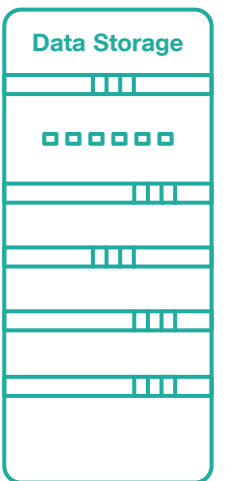
Your benefits

- Automatic data archiving via LIMS Bridge on the server or network
- Accessibility of your raw data without the instrument throughout the entire retention period for audit and verification processes
- Availability of all raw data for back-up and restoring processes
- Export of data in proprietary data format, encrypted and digitally signed
- No risk of data manipulation
- Reviewing of data and further processing
- Availability of data in machine-readable and human-readable format

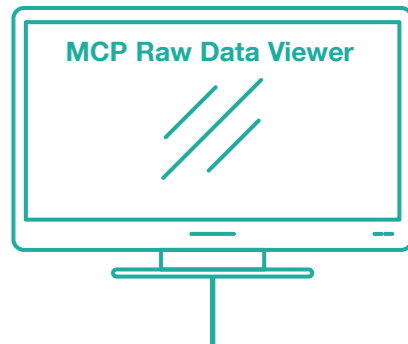
MCP embedded



LIMS Bridge via Ethernet



Raw data file picking



MCP Desktop Software

MCP Raw Data Viewer

Accessories: Simplify your work



Quartz control plates with automatic detection: Toolmaster™ technology

Using intelligent quartz plates with Toolmaster™ technology, calibration and adjustment of the polarimeter no longer require tables and manual data entry. The Toolmaster™ memory chip on the quartz control plate contains all the relevant calibration data, which is automatically transferred to the instrument.

Quartz control plates are solid reference standards for checking and adjusting the polarimeter. All quartz control plates comply with international standards (ICUMSA and OIML).

Sample cells with automatic detection: Toolmaster™ technology

Relevant parameters (path length, sample temperature, material type, serial number, last service date) are transferred to the MCP software automatically to enable maximum traceability and easy handling.

Safe and quick wireless data transmission

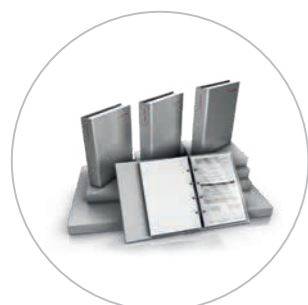
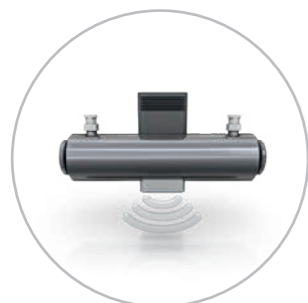
- No handling of external temperature sensor required
- No cross-contamination from an external temperature sensor
- No cables and connectors

Stainless steel or Hastelloy cells with Luer filling port or filling funnel

- Range of cells, from standard stainless steel up to Hastelloy
- Different path lengths from 2.5 mm to 200 mm
- Volumes from 0.7 mL to 20 mL

Assistance with qualification and validation

The MCP polarimeter software fully supports the requirements of the pharmaceutical industry, including GMP, 21 CFR Part 11, GAMP 5, USP<1058>, and international pharmacopoeia (e.g. Ph. Eur., USP, JP). Anton Paar offers a Pharma Qualification and Validation Package which helps to integrate your new MCP into your workflow within a minimum period of time.



Wide variety of applications



Drugs The MCP polarimeter can be used to ensure, for example, proper enantiomer separation, to determine the concentrations of optically active substances, or to investigate correlations between toxicological and pharmacological properties and chirality. MCP meets the standards of international pharmacopoeias and provides full compliance with 21 CFR Part 11 according to FDA.



Food flavors In food production, incoming raw materials and finished products are characterized and tested for purity with MCP polarimeters in combined setups with Abbemat refractometers.



Fragrances In perfume manufacturing, MCP polarimeters in combination with DMA density meters and Abbemat refractometers are used to carry out purity measurements on valuable essential oils and to ensure the constant quality of the perfumes.



Soft matter Gels undergo sol-gel transitions as a function of temperature, composition, solvent exchange with the environment, and other external parameters. To determine the sol-gel transition in optically active samples (e.g. gelatine) MCP with automatic Peltier temperature control can be used for precise stepwise heating around the transition temperature of the product.



Starch An MCP polarimeter can be used for the quality control and purity determination of starch and starch-based products, dextrose, or corn syrup, e.g. HFCS (High Fructose Corn Syrup).



Honey MCP can be used to characterize honey by identifying the carbohydrate composition. The different optical activity of the carbohydrates in the honey also gives insight into the product quality. Good quality honey will show a low content of sucrose but a high content of glucose/fructose. Moreover, with an MCP polarimeter you can distinguish between blossom and honeydew honeys due to their opposed optical rotations.

Specifications

OR at 589 nm	MCP 100	MCP 150	MCP 5100	MCP 5300	MCP 5500	MCP 5500 MW 325
Measuring scales	°Optical Rotation, % concentration (g/100 mL, g/L, g/100 cm³, kg/m³), °Specific Rotation	Optical Rotation, % concentration (g/100 mL, g/L, g/100 cm³, kg/m³), °Specific Rotation, customizable scales	°Optical Rotation, °Optical Rotation (cell-length corrected), °Specific Rotation, °Specific Rotation (cell-length corrected), % concentration (g/100 mL, g/L, g/100 cm³, kg/m³), °International Sugar Scale (not temperature-compensated), mathematic functions, and user-definable scales			
Measuring range	±89.9°	±89.9°	±89.9°	±89.9°	±89.9°	±89.9°
Resolution	0.001°	0.001°	0.001° (0.0001° optional)	0.001° (0.0001° optional)	0.0001°	0.0001°
Accuracy*	±0.01°	±0.004°	±0.0025° (0.0020° optional)	±0.0020°	<0.0020°	<0.0020° (589 nm)
Repeatability	±0.01°	±0.004°	±0.002°	±0.002°	±0.001°	±0.001°
Wavelength	589 nm	589 nm	589 nm and optionally up to eight wavelengths. Standard spectral wavelengths (365, 405, 436, 546, 578, 633, 880 nm), customer-specific wavelengths on request			
Light source	LED	LED	LED light source with from 50 000 up to 100 000 hours lifetime for all wavelengths (325 nm to 880 nm)			
Sensitivity	Optical Density (OD) 2.0		Optical Density (OD) of 4.0			
Temperature control & measurement						
Sensor	Pt100 sensor for sample temperature measurement inside the cell or quartz control plate; wireless transfer to the instrument		PT100 sensor for sample temperature measurement inside the cell or quartz control plate; wireless transfer to the instrument			
Resolution	0.1 °C	0.1 °C	0.1 °C	0.01 °C	0.01 °C	0.01 °C
Accuracy**	±0.2 °C	±0.1 °C	±0.1 °C	±0.05 °C	±0.03 °C	±0.03 °C
Temperature control range***	20 °C and 25 °C		20 °C and 25 °C (optional 10 °C to 45 °C)		10 °C to 45 °C	
Dimensions, power requirements, interfaces						
Dimensions (L x W x H)	370 mm x 320 mm x 130 mm		797 mm x 437 mm x 231 mm			
Weight	8.6 kg		33.5 kg			
Power management	Self-adapting to any mains voltage, 100 to 240 VAC, 50/60 Hz		Power supply self-adapting to any mains voltage, 100 to 240 VAC, 50/60 Hz			
Power consumption	typ. 70 VA, max. 120 VA		185 VA			
Interfaces	USB, RS232, Ethernet, CAN bus. Easy connection of keyboard, mouse, printer, bar code reader, and networks.		4 USB, RS232, Ethernet, VGA, CAN bus. Easy connection of keyboard, mouse, printer, bar code reader, and networks.			
Accessories						
Sample cells	Sample cells from 2.5 mm to 100 mm with wireless temperature measurement		Toolmaster™: Wireless automatic identification of sample cells via RFID, sample cell path length from 2.5 mm to 200 mm			
Quartz control plates	Automatic identification of the quartz control plate and automated wireless transfer of reference parameters into the instrument		Automatic identification of the quartz control plate and automated wireless transfer of reference parameters into the instrument			
Features						
Automatic Peltier temperature control	●	●	●	●	●	●
Wireless Toolmaster™ technology	●	●	●	●	●	●
Audit trail	●	●	●	●	●	●
Access control	●	●	●	●	●	●
User levels	●	●	●	●	●	●
User group administration	○	●	●	●	●	●
Electronic signature	○	●	●	●	●	●
Multiple measurement	○	●	●	●	●	●
FillingCheck™	○	○	○	●	●	●
Air pump	○	○	○	●	●	●
Multiple wavelengths	○	○	○	○	○	●
MCP desktop control	○	○	●	●	●	●

* under physical standard conditions | ** with Peltier module and Toolmaster™ sample cell (50/100/200 mm)
 *** the temperature control at 10 °C is under physical standard conditions

○ not available | ● optionally available | ● standard

