Unique flexibility in molecular spectroscopy

SPECORD PLUS accessory range

UV/Vis Spectroscopy

analytikjena
An Endress+Hauser Company

SPECORD PLUS series – Ultimate precision in UV/Vis technology

The SPECORD PLUS series includes UV/Vis instruments of outstanding precision and reliability with a broad range of accessories for diverse applications.

The SPECORD PLUS series offers flexibility and ease of use for handling current and future analytical challenges. The equipment is characterized by high-end technology for precise UV/Vis spectroscopic measurements and reliable results. The extended wavelength range in the UV spectrum and NIR region from 185 to 1200 nm, in combination with the various accessories for liquid, gaseous, powdered, and solid samples, ensures a variety of molecules and compounds can be analyzed using UV/Vis spectroscopy. The Windows-based software is designed for both beginners and experts in UV/Vis spectroscopy and supports work in accordance with the latest pharmacopoeia regulations and in highly regulated industries.

Combined talent

Intelligent technology, combined with experience spanning decades, guarantees the highest level of quality.

The SPECORD PLUS series is:

- **User-friendly**
  Intuitive software, large sample chamber, easy exchange of accessories and lamps
- **Versatile and flexible**
  Extensive range of accessories for liquid, gaseous, solid and powdered samples
- **Powerful and reliable**
  High-precision optics to analyze samples with low concentrations as well as those that are turbid, 10-year warranty
- **Compliant to pharmacopoeias**
  Hard- and software fully compliant to pharmacopoeias, special software module available for FDA 21 CFR Part 11, Ph. Eur., and USP

The SPECORD PLUS product family – Modern classics in UV/Vis

Spectrophotometers were among the first analytical instruments ever developed. To this day, SPECORD PLUS photometers continue to be reliable, user-friendly, and offer flexibility in UV/Vis spectrophotometry.

Back in the 1920s, Carl Zeiss laid the foundation for the development of spectrophotometry in Jena. 100 years later, Analytik Jena and its SPECORD PLUS series continue to provide a wide range of models, accessories, and application options for reliable, robust, and high-quality spectrophotometry with a long history – adapted to the requirements of the modern world.

The strengths of the SPECORD PLUS product family at a glance

- 10-year warranty on optics
- Additional position for turbid samples
- Tool-free exchange of accessories and lamps
- High-precision optics for high accuracy and good resolution
- Double-beam monochromator compensates for lamp fluctuations
- Robust hardware with a long lifespan
- Large sample chamber for ease of handling
- Intuitive software in ten languages

SPECORD 50 PLUS

Double-beam photometer with split-beam technology

- High energy intensity thanks to split-beam technology
- Internal reference measurement
- Suitable for highly concentrated or impure samples (e.g. wastewater analysis)
- Ideally suitable for using an integrating sphere in the visible spectrum

SPECORD 200 PLUS

Double-beam photometer for the simultaneous measurement of sample and reference signals, with fixed slit width

- Good resolution
- Good signal-to-noise ratio
- Ideal for samples with low concentrations (e.g. drinking water analysis)
- Long-term stability due to electronic compensation of lamp intensity fluctuations

SPECORD 210 PLUS

Double-beam photometer for the simultaneous measurement of sample and reference signals

- Extended wavelength range from 185 to 1200 nm
- Variable slit width to adjust energy intensity
- Greater long-term stability thanks to detectors with Peltier temperature control
- Minimal deviation in the base line
- Suitable for a broad concentration range
- Ideally suitable for using an integrating sphere across the entire measurement range

SPECORD 250 PLUS

Double-beam photometer for the simultaneous measurement of sample and reference signals

- Minimal scattered light thanks to the double monochromator
- Variable slit width to adjust energy intensity
- Best signal-to-noise ratio thanks to Peltier-cooled detectors
- Ideal for solids analysis, for example analyzing path length (or suitable for samples with a high percentage of scattered light)

SPECORD PLUS accessories

Well equipped for all requirements

The SPECORD PLUS can be equipped according to your application requirements – with multiple options for routine analysis or specialist solutions and with scope for future upgrades and additions. Analysis is not just limited to liquids and powders, it is also possible to investigate solids and even gases.

Cuvette holder

- To hold one cuvette
- Flexible path length of 1 mm to 100 mm
- Rectangular, round, and cylindrical cuvettes can be used as well as absorption tubes

Cuvette changer

- To hold multiple cuvettes at the same time
- For 6, 8, or 15 standard cuvettes
- Available with or without stirrer

Cuvette holder with temperature control

- To hold one cuvette with temperature control
- Application-dependent temperature control via external liquid thermostats or Peltier control by means of external heat exchangers or air cooling
- Different temperature ranges are possible
- Available with or without stirrer

Cuvette changer with temperature control

- To hold 6, 8, 10, or 14 cuvettes at the same time with temperature control
- Depending on the application, the temperature is controlled via external liquid thermostats or Peltier control using external heat exchangers
- Available with or without stirrer
- Temperature sensors available for several cuvette models

Flow measurements

- Cassette sipper system to measure in a flow process without changing the cuvette
- Suitable for flow cells with path lengths of 10, 20, 40, or 50 mm
- Sample and reference can be analyzed at the same time
- For fully automated analysis when combined with the APG autosampler
  - Sample tray available with 49, 64, or 116 positions

Solids analysis

- Various holders and accessories for solids analysis
- Determination of transmission, reflection, remission, scattering, path length, and refractive index
  - For films, powders, and solids with rough and smooth surfaces
  - Angle-dependent measurement geometry

Fiber-optic coupling

- For rapid measurements outside of the sample chamber, e.g. in a glass beaker
- Connection of various optical probes possible
- Special adapter available for probes with SMA or collimator connection

Other accessories

- Deuterium and halogen lamps
- Cuvettes with path lengths from 0.1 to 50 mm and in various designs
- Certified reference materials
- Tubes

Cuvette holder

Our cuvette holders fulfill a wide range of requirements. Whether you use standard cuvettes or test kits, measure the smallest sample volumes or samples with low concentrations – the range of accessories for the SPECORD PLUS series provides a solution for every requirement without limiting the path length or center height.

Cuvette holder for macro cuvettes

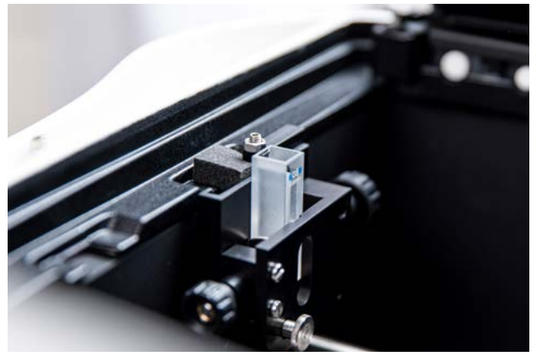
For **routine analysis without large sample volumes,** or to **quickly and easily change measurement methods and samples,** these holders are suitable for cuvettes from 10 mm to 50 mm, or 10 mm to 100 mm. The holder for a path length of up to 50 mm is included in the SPECORD PLUS scope as standard. The special holder for cuvettes with a path length of up to 100 mm is particularly well suited to **measuring samples with low concentrations** as a result of the extended optical path through the sample. The increased measurement sensitivity is especially relevant for the analysis of drinking water or the determination of trace elements or toxins.

Cuvette holder for micro cuvettes

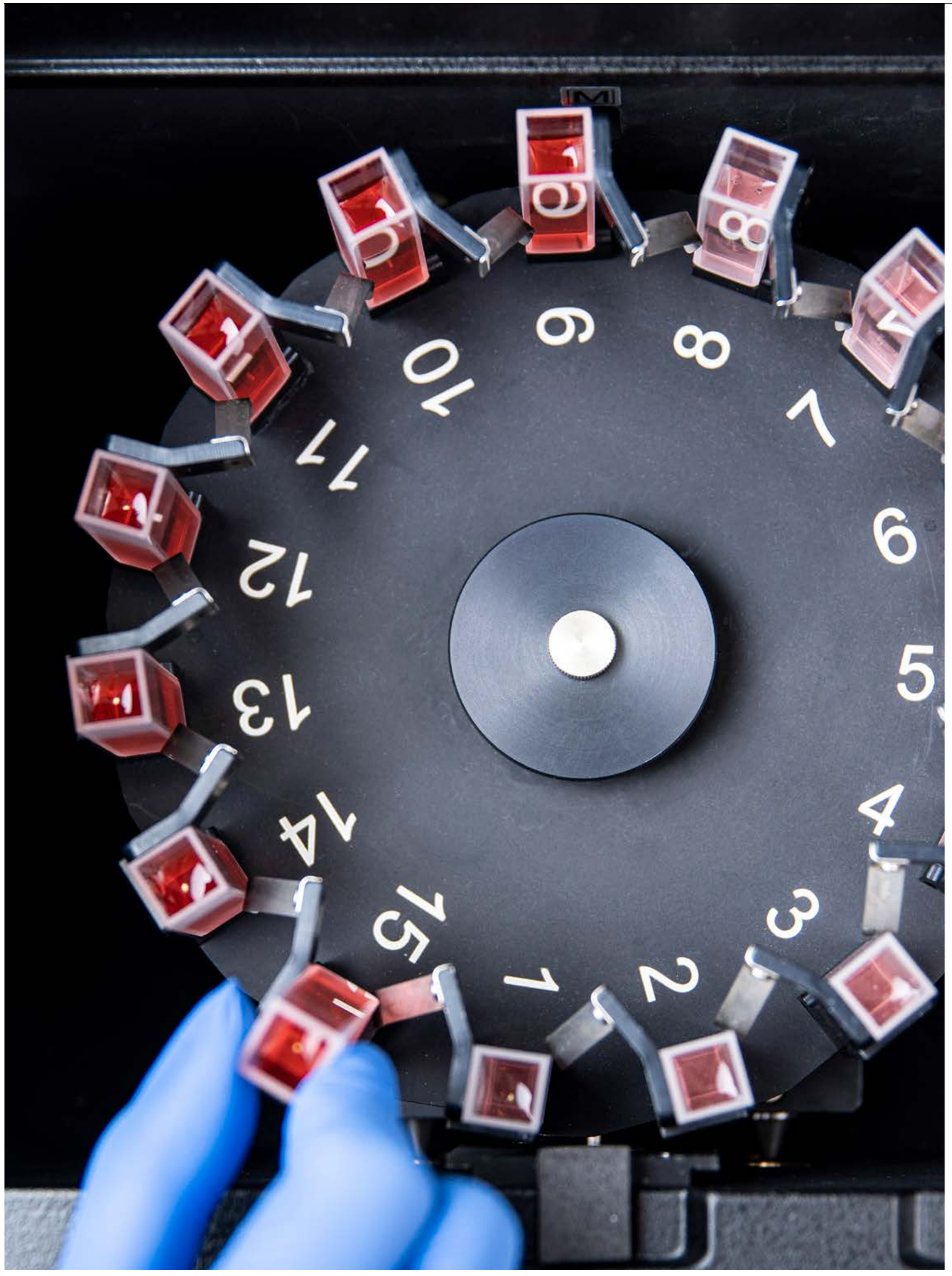
Unlike drinking water analysis, the **life sciences or biotechnology fields** often have **highly concentrated solutions**, however only **very small sample volumes** are available for analysis. **Adjustable holders for various path lengths and center heights** have been developed specifically for these applications. The optimum positioning of the cuvette in the beam path helps reduce scattered light effects which can have a significant impact on the measurement results, especially for small sample volumes. To prevent carryover or cross-contamination when performing bioanalysis, e.g. of DNA, RNA and proteins, additional special adapters are available for ultramicro plastic cuvettes, which are fitted with an integrated aperture baffle.

Cuvette holders for special cuvettes

Specially designed for routine and rapid quantitative **wastewater analysis**, the ready-to-use **test kits in round cuvettes** are a standard application, for example to determine sum parameters such as CSB, BSB, SAK_{254}, or turbidity or common individual parameters such as ammonium, nitrate, nitrite, or phosphate. These test kits can be positioned in the holder for round cuvettes. Consequently, the test kits can be used for conventional wet chemical methods as well as for rarer parameters. In addition to test kits, **ampoules, round cuvettes, and test tubes** can also be inserted in the round cuvette holder, thereby making it suitable for **biotechnological and medical applications** as well. What's more, holders are available for cylindrical cuvettes, e.g. to analyze the polarization of light in sugar or to analyze samples that need pressure-resistant cuvette material as well as for absorption tubes to investigate liquid and gaseous samples.



All accessories from page 24 ▸



Cuvette changer

Cuvette changers enable more effective routine analysis. Up to 16 cuvette measurement positions can be examined in one analysis pass. The changers are available with or without a stirrer function and in different designs for special applications.

Cuvette changer

Work is made easier for **routine analysis with high sample volumes** by using **cuvette changers,** because multiple samples can be analyzed without having to change the cuvette before and after every measurement. Depending on the application, there is a 6-cell cuvette changer with a linear arrangement or an 8-cell cuvette changer with an offset arrangement for 10 mm standard cuvettes.

The linear arrangement in the 6-cell cuvette changer enables identical optical conditions for each sample, achieving **high accuracy and good reproducibility** across the samples, even for turbid or scattered samples (e.g., beer or fruit juices). The offset arrangement of the 8-cell cuvette changer makes optimum use of the space available in the sample chamber, **maximizing the number of cuvette positions.** However, this arrangement is not suitable for analyzing turbid samples. This accessory is ideally suited to verifying the purity of bulk chemicals for incoming goods checks or process control. Both changers are also optionally available with an integrated stirrer.

In addition to the cuvette changers in which the cuvettes are arranged side by side, another option is a **cuvette carousel** with a circular arrangement that can accommodate up to **15 standard cuvettes** in the sample chamber. The accessory rotation ensures an identical position for each sample measurement.

Special cuvette changers

Depending on the application and cuvettes used, there are several **special cuvette changer models** in our range.
A 6-cell changer is already fitted with aperture baffles and special cuvette holders for UV ultramicro plastic cuvettes, making it possible to analyze multiple **DNA or RNA samples.**
A 6-cell changer is available for cuvettes with a path length of up to 50 mm for **diluted water samples**. The 8-cell cuvette changer is suitable as a dissolution model for analyzing the **release of active ingredients**. The tubes with the dissolution solutions can be mounted on a special holder.

Simultaneous use of two cuvette changers

The large sample chamber of the SPECORD PLUS spectrophotometer enables the **simultaneous use of two 6 or 8-cell cuvette changers**.
These can either be used **synchronously or asynchronously.** Synchronous mode is used if each sample needs a separate reference. Samples are placed in one changer and the references are placed in the other with the sample and reference measurement being performed simultaneously. Only one reference position is needed in asynchronous mode whereby 10 or 14 samples can be analyzed in one measurement process.

All accessories from page 25 ▸

Cuvette holder with temperature control

Irrespective of whether the temperature is constant or changes continuously – it is vital to precisely set and measure the temperature for a wide range of applications such as DNA melting point determination or kinetic food analysis. The specially developed accessories with different technical specifications support the corresponding measurements.

Cuvette holder with external liquid thermostats

These cuvette holders have been designed with external liquid thermostats and are specifically developed for **applications in biosciences and life sciences** as well as **food analysis**, which require consistent temperatures over a long period of time. **The active temperature is controlled with a coolant** (predominantly water). The same coolant can be used for both measuring facilities in the SPECORD 200 to 250 PLUS series to ensure consistent and comparable conditions for the sample and reference. The holders can be flexibly moved between the devices in the SPECORD PLUS series. The cuvette holder with external liquid thermostats can be purchased with or without a stirrer. For highly diluted samples, a special temperature-controlled holder is available for cuvettes with a path length of up to 50 mm.

Peltier temperature-controlled cuvette holder

For **highly precise measurements** with a temperature accuracy of +/- 0.1 °C, we have a Peltier temperature-controlled cuvette holder with a **thermoelectric heating and cooling function**. Three different sensors measure the temperatures in the block, holder, and cuvette. This enables measurements to be taken precisely at the point of achieving the pre-defined temperature, controlled via ASpect UV software. As part of data evaluation, the temperatures are stored in the software during the measurement.
To ensure a consistent temperature distribution within the cuvette, all Peltier temperature-controlled cuvette holders are equipped with a stirrer. The highly precise Peltier temperature-controlled cuvette holders can be regulated by an external heat exchanger or by air cooling as desired.

Peltier temperature-controlled cuvette holder with external heat exchanger

The Peltier temperature-controlled cuvette holders with external heat exchanger are characterized by more than **precise temperature accuracy**. They also offer **extremely quick heating and cooling speeds.** The **temperature** can also be **kept constant for a long time,** depending on the thermal capacity of the solvent being used. The available temperature range is -10 to 105 °C at an ambient temperature of 25 °C.

Optionally combining this accessory with the aperture baffle offers even greater precision, also for ultramicro plastic cuvettes. The minimal space requirement in the sample chamber means that an additional accessory can be used.

Air-cooled Peltier temperature-controlled cuvette holder

The air-cooled Peltier temperature-controlled cuvette holders are available in **two different temperature ranges:** From -10 to 105 °C for diverse demands and from 10 to 60 °C for special life science and biotechnology applications. These holders are also characterized by their **low energy consumption, particularly at high temperatures**. The complete and air-tight cover means that there is no possibility of installing an additional accessory, which is another distinction between the corresponding holders for the SPECORD 50 PLUS and the devices in the SPECORD 2xx PLUS series.

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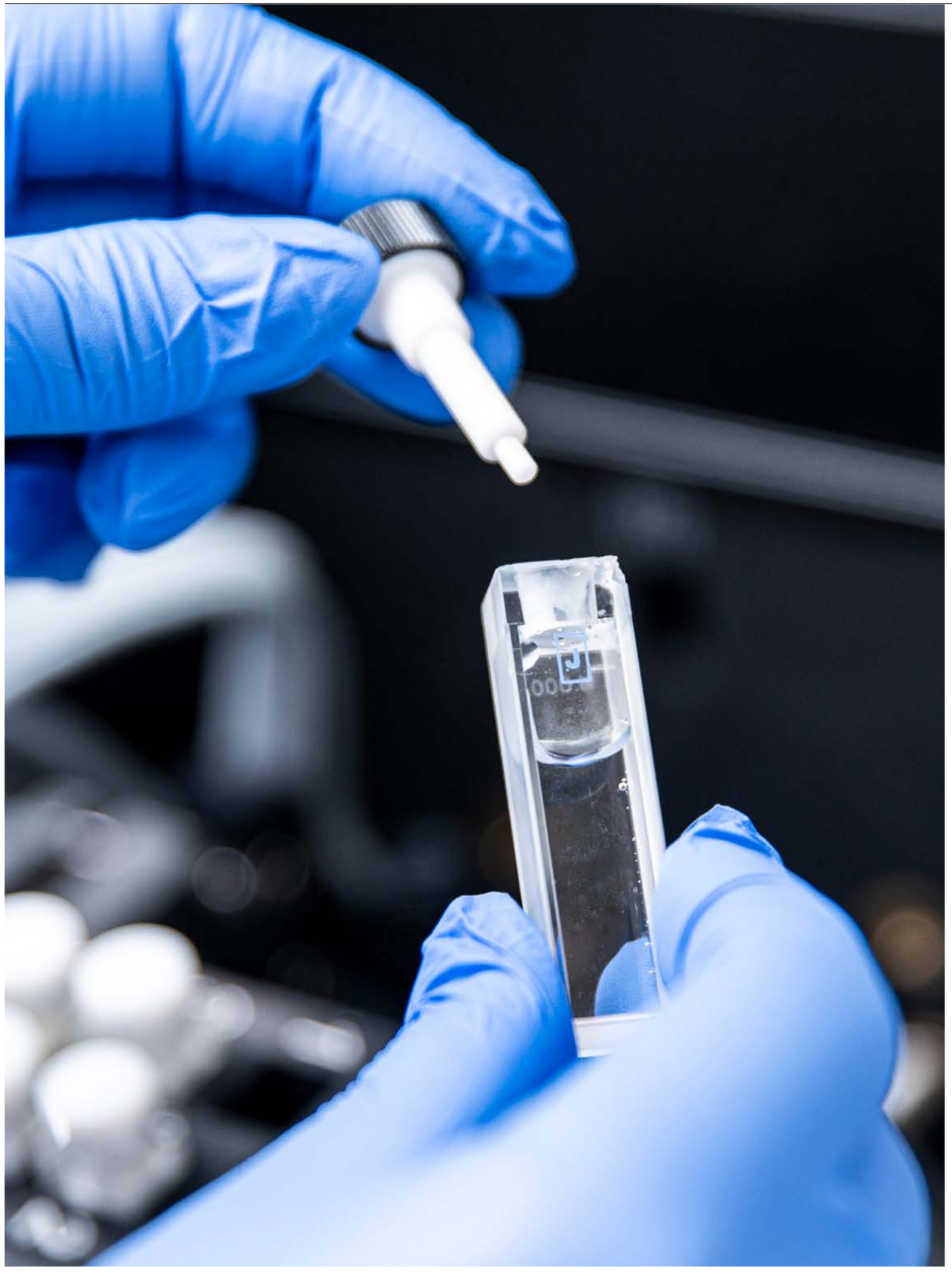

Cuvette changer with temperature control

Automation with high sample throughput is especially relevant for temperature-controlled measurements as this is where the majority of work time can be saved. For these applications, a temperature-controlled cuvette changer is ideal for the controlled measurement of up to 14 samples.

Cuvette changer with temperature control

Cuvette changers with temperature control are primarily suited to **applications with a high sample throughput for medical or biotechnological investigations,** such as DNA melting point determination, purity determination, protein analysis, or enzyme kinetics. A special feature of all temperature-controlled cuvette changers is an air stream that flows past the cuvettes during the heating process, to prevent the cuvettes getting steamed up in high humidity or with rapid temperature changes. As for the temperature-controlled cuvette holders, the cuvette changers with temperature control also make use of two different technologies to regulate the temperature.

Peltier temperature-controlled cuvette changer

The Peltier temperature-controlled cuvette changers include both 6 and 8-cell changers for all SPECORD PLUS models and **2x6 and 2x8-cell changers for even higher sample throughput** in the SPECORD PLUS 2xx series models, optionally with stirring function. The 2x6 and 2x8-cell changers are synchronized via a guide rail. All cuvette changers can be used at a temperature accuracy of 0.1 °C in the temperature range -5 to 105 °C, which is achieved by using an external heat exchanger. Temperature control is maintained using a temperature sensor, which is included in the standard scope of delivery of all Peltier temperature-controlled cuvette holders and changers, and which measures the temperature of the solvent directly in the cuvette. For special applications, special temperature sensors are available for micro cuvettes and cuvettes with a seamed lid. The aperture baffle also makes it possible to use micro cuvettes without black walls in Peltier temperature-controlled cuvette changers.

Cuvette changer with external liquid thermostats

Cuvette changers with external liquid thermostats are cooled in the same way as the holders, with a **coolant**. Both the 6 and 8-cell cuvette changers are available with or without a stirrer, taking into account that it is possible to dispense with the stirring function for cost reasons when temperatures are constant and low. Cuvette changers with external liquid thermostats can be installed in any SPECORD PLUS model. When using ultramicro cuvettes without blacked out cuvette walls, the aperture baffle can be installed directly on the base plate of the changer.

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Flow measurements

In environmental analysis in particular, there are often a wide range of parameters that need to be analyzed for high sample volumes. A sipper system and autosampler with up to 116 positions are essential for high throughput analysis.

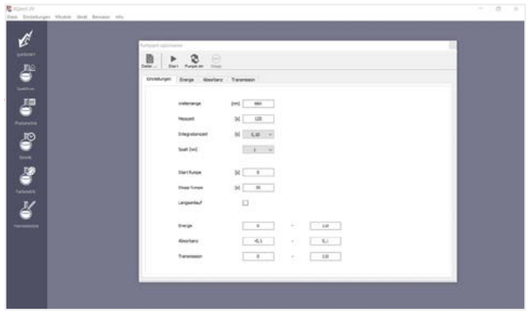
Cassette sipper system

The cassette sipper system used to **measure liquid samples in flow** is used primarily in quantitative water analysis, e.g. when determining the concentration of nitrate, ammonium, and phosphate. By using a suction tube and measuring cuvette, **many samples can be analyzed quickly without having to change the cuvette.** The sipper system provides the option of installing two flow cuvettes with a path length of 10 to 50 mm in the sample chamber which makes it easy to analyze samples of low and high concentrations as well as save time when changing between methods. Analyzing drinking water, surface and wastewater can thereby be performed **quickly, cost-effectively and in a manner compliant with standards.**

When taking **measurements with a high throughput,** the sipper system can be combined with an autosampler to fully automate the quantitative sampling and analysis of **up to 116 samples**. **Various racks** are available depending on the number of samples and sample volume. Using the stirrer function means that samples can be **individually stirred** in the sample containers.

ASpect UV – Optimization of pumping time

This software-based tool for optimizing pumping time establishes the **ideal duration** for the sample to be pumped into the measuring cuvette. To ensure that the flow cuvette is always filled with the sample that needs to be measured as well as to save time and sample volumes, it is possible to analyze the **optimal pumping time** using the SPECORD PLUS software ASpect UV.



Optimization of pumping time in ASpect UV

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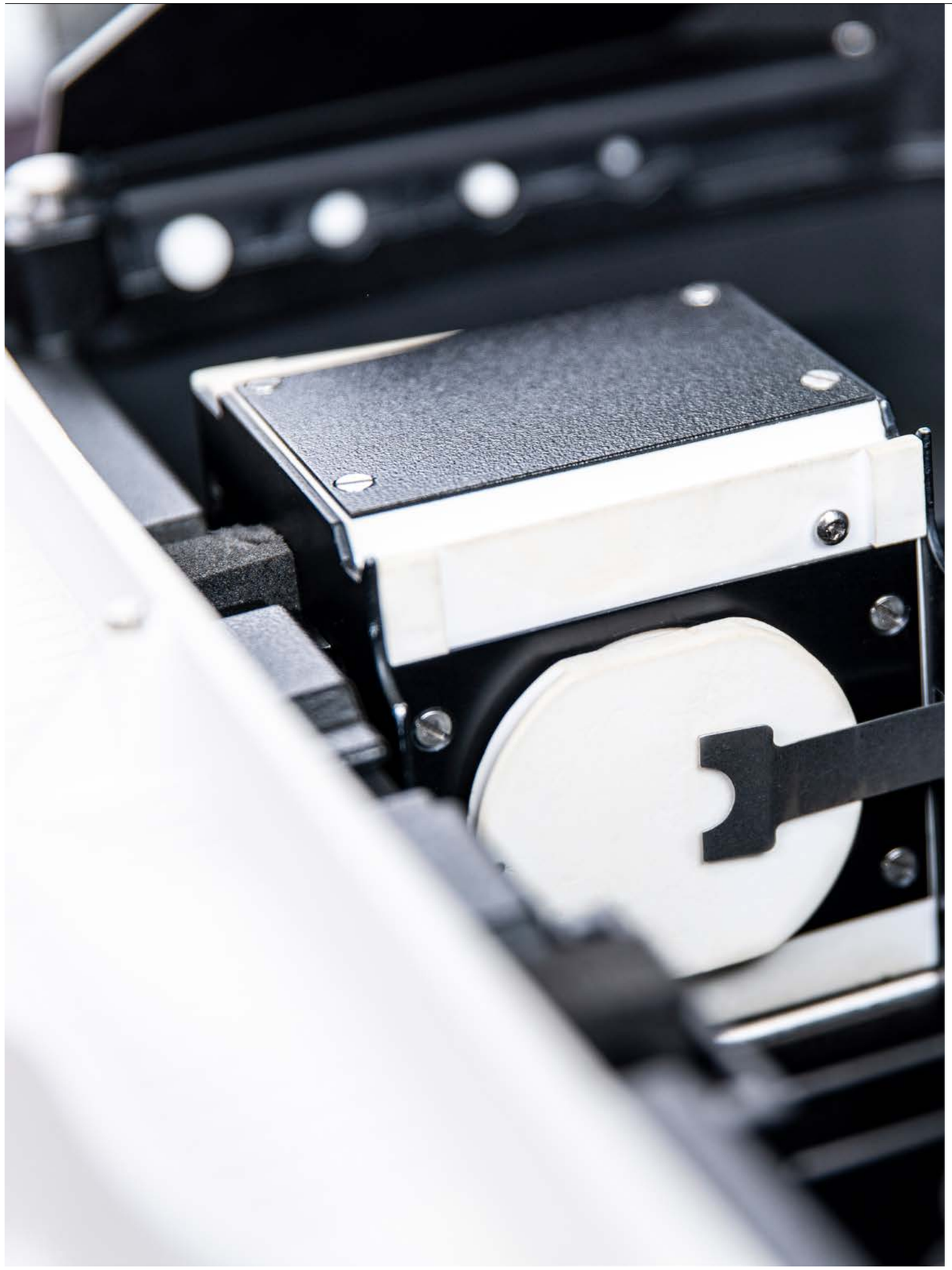

Solids analysis

In addition to the standard analysis of liquids, solids analysis is gaining in significance – irrespective of whether it is used to determine the color of textiles, the UV permeability of films, or the reflectance of reflective samples – with the right accessory, it is possible to analyze the transmission and reflection properties of solids.

Holder for solid samples for films or sample plates

The holder for solid samples was developed specifically to **analyze the transmission properties of transparent, non-scattering samples.** This holder is particularly used in materials analysis, for instance when **measuring the transmission of films and glassware**, as well as when testing the UV permeability of **pharmaceutical packaging**.

Holder for contact lenses

The holder for solid samples can be extended with the holder for contact lenses. Testing the **UV permeability of contact lenses** is particularly challenging due to the curvature of the lenses. By using the holder, contact lenses of different diameters can be analyzed easily and reproducibly.

Scanning attachment for solid samples

The scanning attachment for solid samples is used to precisely analyze **material properties** such as sample compositions or coating quality. This enables the determination of **spatially resolved transmission measurements for large-scale, solid, and permeable samples.**

Integrating sphere

Integrating spheres (also called Ulbricht sphere) enable **liquid, solid, and powdered scattering samples to be measured in terms of transmission or reflectance.** With a diameter of 75 mm, this is ideally suited to quality control applications. Both the total and diffuse transmission at an angle of 0° as well as reflection and remission at an angle of 8° can be measured with the integrating sphere.

It is easy to calculate the target transmission and reflectance using the ASpect UV software. Integrating spheres are used, for example to **determine color and the degree of whiteness of solids** such as textiles, fillers and powders, as well as to test the light permeability of **scattering films**.

Measuring insert for absolute reflectance

The degree of reflectance of the sample is directly measured with the measurement attachment. No additional certified reference mirror is needed for the measurements. The absolute reflectance plays a major role when **evaluating the optical performance of highly reflecting samples** such as mirrors, coated glassware, and other optical components. By using the measuring insert, with a reflection angle of 7°, the absolute reflectance on level surfaces is determined by means of V-W beam arrangement. Even small samples starting from 20 mm can be measured using the additional sample mounts.

Measuring insert for reflectance at a variable angle from 11° to 60°

The measuring insert makes it possible to analyze **reflectance measurements of solid surfaces, layered systems and their interfaces at different angles of reflectance.** In contrast to the measuring insert for absolute reflectance, a reference mirror is needed for these measurements. **Films and coatings on reflective surfaces** such as mirrors, wafers, lenses, or filters, can be analyzed using the measuring insert, which also enables path length to be **determined**.

All accessories from page 33 ▸

Fiber-optic coupling

Fiber-optic probes, used to measure samples outside of the sample chamber, make UV/Vis spectroscopy even more flexible and provide a wide range of application options for various sectors.

Fiber optics
Fiber optics and a cuvette interface are required to couple the probe to the SPECORD PLUS. The optical connection is made via collimators or SMA connectors, depending on the fiber-optic probe. Besides various optical connections, fiber optics are available in different lengths and with diverse sheath materials.

Probe
By using a probe, **samples can be analyzed directly outside of the sample chamber.** The UV/Vis lab probes can be configured according to specific requirements and the measurement task, covering the most diverse applications. Probes make it possible to quickly and easily investigate **highly absorbent samples** (e.g., printing inks), **hazardous substances, active ingredient release testing** (dissolution tests), and **electroplating baths.** In addition to liquid media, solid samples and powders can also be analyzed.

All accessories from page 34 ▸

Other accessories

In addition to a multitude of holders, changers and solid accessories, our product range also includes further accessories such as hoses and cuvettes for specific applications.

Base plate for installing special accessories
The base plate facilitates the installation of **company-specific measuring components** and **special accessories** in the sample chamber. This can be positioned in the sample chamber at a flexible distance from the detector.

Base plate with aperture baffle
The base plate with aperture baffle is particularly suitable for **working with cuvettes that have a large path length, as well as (ultra)micro or semi-micro cuvettes without black walls** in a standard cuvette holder. Using the baffle minimizes scattered light effects.

Aperture baffle
The aperture baffle itself is intended for use with **(ultra) micro or semi-micro cuvettes without black walls.** It can be mounted directly on the base plate of cuvette changers.

Universal holder for all sample and cuvette holders
The universal holder serves to accommodate a sample or cuvette holder in a **variable position in the sample chamber** and is only needed if the existing holder attached to the chamber wall is not sufficient.

Temperature sensor for Peltier accessories
In addition to the temperature sensors for macro cuvettes included in the standard scope of delivery, other variations of temperature sensors enable the **sample temperature to be recorded in other types of cuvette**. The range also includes a temperature sensor for ultramicro and macro cuvettes with a seamed lid.

Aluminum spacer – 5 mm
This spacer is available to ensure that cuvettes with a path length of 5 mm can be used in holders and changers that are **designed for 10 mm cuvettes.**

External liquid cooling thermostat RA 8 or external liquid thermostat A6
These are intended to be used with **temperature-controlled holders and changers with an external thermostat.** The temperature range is -25 to 85 °C or 25 to 85 °C at 25 °C ambient temperature.

Lamps
The SPECORD PLUS devices work using a combination of a **deuterium** (UV spectrum) **and a halogen lamp** (visible range) to ensure high energy across the entire wavelength range. The lamps can be easily changed without using any tools.

Note
- Further consumables can be found in the list of consumables.

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SPECORD PLUS software – ASpect UV

The Windows-based software ASpect UV is a powerful and flexible tool to record and analyze measurement data. Whether routine analysis or complex applications, both UV/Vis novices and experts can achieve consistent and reproducible measurement results of the highest quality.

ASpect UV basic software

The multilingual software has an impressively **easy to use interface** with a consistent structure throughout the modules. The comprehensive SPECORD PLUS software ASpect UV contains a **wide range of measurement modules,** which ensures it covers everything from the simplest application to more complex measurement tasks. The basic software includes the following measuring modules:

- **Photometry**, for measurements at a single or multiple defined wavelengths
- **Spectrum**, to record a spectrum across the entire measurement range or a subsection thereof
- **Kinetics**, for cyclical measurements
- **Thermometry**, for temperature-dependent analyses
- **Colorimetry**, to determine color coordinates and color counts

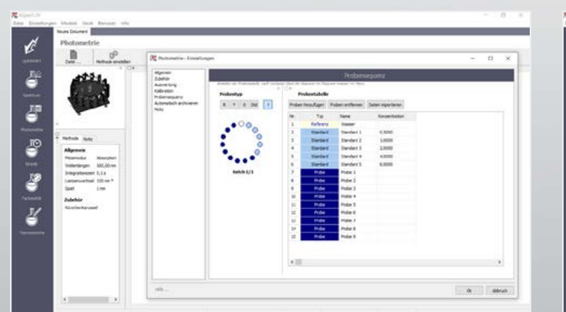
Measurement parameters, evaluation options, sample tables, automatic saving, exporting, and printing can be set directly in the measurement methods. Methods can be stored in QuickStart for fast access. Besides an **integrated audit trail**, which ensures complete traceability of all electronic data, comprehensive and configurable report templates provide full data clarity in PDF and paper formats.

FDA 21 CFR Part 11-conformity – Add-on module for ASpect UV

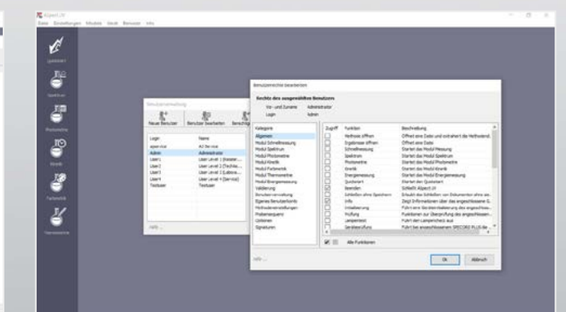
The flexible FDA 21 CFR Part 11 module is a special software module used to fulfill the strict requirements regarding **data integrity** in a regulated environment. A comprehensive **user management system** provides secure data analysis and evaluation, and together with Analytik Jena File Protection, data integrity is guaranteed on a local PC. During the measuring process, the software can be locked to prevent third-party access to the data. Installing the FDA 21 CFR Part 11 module automatically creates six pre-set user levels. Additional users can be added and assigned individual access rights. Electronic signatures can also be configured according to the application and allocated to individual users. Thanks to the integrated password complexity and history, **user-specific requirements** are considered and fulfilled.

Analytik Jena File Protection

File protection is provided by a driver that has been programmed by Analytik Jena and certified by Microsoft, which protects **data from accidental and intentional manipulation**, such as deletion, renaming, or relocating.



Quantitative analysis in ASpect UV



User management in ASpect UV

Pharmaceutical validation

A regulated environment means that strict requirements must be met. Combined with ASpect UV software, SPECORD PLUS guarantees compliance with defined regulations.

Ph. Eur. and USP compliance – Validation modules for ASpect UV

To ensure that the spectrophotometer delivers correct and accurate results, several key device parameters must be tested according to strict guidelines. These include: **wavelength accuracy, photometric accuracy, linearity, scattered light,** and resolution. The **flexible validation modules** can be used to help measure various certified reference materials, according to the field of work. The software then performs a qualification process and checks that all tests are performed correctly and are recorded.

The functional check of the SPECORD PLUS is performed without accessories, with regularly certified reference materials and can be carried out by Analytik Jena's service team or by users themselves. To ensure that the spectrophotometer can always be qualified according to the latest version of the pharmacopoeia, the software is continuously refined and updated5. Updates can be requested from Analytik Jena.

Cuvette holders

	Accessory	Description	Order number
	Cuvette adapter for plastic ultramicro cuvettes, center height 15 mm	Cuvette holder for a plastic ultramicro cuvette with center height of 15 mm The adjustable holder for cuvettes of 10 to 50 mm (820-60284-0) is required for connection to the photometer! Please order the adjustable holder and cuvettes separately!	820-60327-0
	Cuvette adapter for plastic ultramicro cuvettes, center height 8.5 mm	Cuvette holder for a plastic ultramicro cuvette with center height of 8.5 mm The adjustable holder for cuvettes of 10 to 50 mm (820-60284-0) is required for connection to the photometer! Please order adjustable holder and cuvettes separately!	820-60328-0
	Cuvette adapter for plastic ultramicro cuvettes, UVette	Cuvette holder for an Eppendorf micro cuvette UVette with 2 or 10 mm path lengths applicable without additional Eppendorf adapter The adjustable holder for cuvettes of 10 to 50 mm (820-60284-0) is required for connection to the photometer! Please order the adjustable holder and cuvettes separately!	820-60322-0
	Holder for absorption tube for larger samples	To accommodate larger absorption tubes. The universal holder for all sample holders and cuvette holders (820-60171-0) is required for connection to the photometer! Please order cuvettes and universal holder separately!	820-60170-0
	Adjustable holder for cuvettes with 10, 20, 40 or 50 mm path length, variable xyz-position	To accommodate a cuvette with 10, 20, 40 or 50 mm path length, variable center height 8.5 or 15 mm, xy-positioning exactly to the measuring beam possible to avoid scattering effects not compatible with universal holder for all sample holders and cuvette holders (820-60171-0) Please order cuvettes separately!	820-60284-0
	Adjustable holder for micro cuvettes with 1, 2, 5 or 10 mm path length, variable xy-position	To accommodate a cuvette with 1, 2, 5 or 10 mm path length, center height 8.5 mm, xy-alignment exactly to the measuring beam possible Please order cuvettes separately!	820-60097-0
	Adjustable holder for micro cuvettes with 10 mm, variable xy-position and center height	To accommodate a micro or ultramicro cuvette with 10 mm path length, variable center height of 8.5 and 15 mm, xy-alignment exactly to the measuring beam possible Please order cuvettes separately!	820-60137-0
	Holder for cuvettes from 10 to 100 mm	To accommodate a cuvette with 10 to 100 mm path length Please order cuvettes separately!	820-60118-0
	Holder for cylindrical cuvettes from 10 to 100 mm path length	To accommodate a cylindrical cuvette with an outer diameter of 22 mm Please order cuvettes separately!	820-60111-0
	Holder for cylindrical cuvettes from 10 to 50 mm path length	To accommodate a cylindrical cuvette with an outer diameter of 22 mm Please order cuvettes separately!	820-60112-0
	Holder for round cuvettes 11 to 16 mm diameter	To accommodate a round cuvette with variable diameters from 11 to 16 mm from Merck, Macherey Nagel, HACH, etc. Please order cuvettes separately!	820-60136-0
	Holder for standard cuvettes with 10 to 50 mm	To accommodate a cuvette with 10 to 50 mm path length Please order cuvettes separately!	820-60087-0

Cuvette changers

	Accessory	Description	Order number
	6-cell cuvette changer, non-temperature controlled, without stirrer	Cuvette changer for the accommodation of 6 cuvettes with 10 mm path length, non-temperature controlled, without stirrer. Can be combined with the following product: ▪ 820-60275-0 Aperture baffle Please order cuvettes separately!	820-60335-P
	6-cell cuvette changer, non-temperature controlled, with stirrer	Cuvette changer for the accommodation of 6 cuvettes with 10 mm path length, non-temperature controlled, with stirrer. Can be combined with the following product: ▪ 820-60275-0 Aperture baffle Only for 230 V / 50 Hz, other voltages on request. Please order cuvettes separately!	820-60281-P
	6-cell cuvette changer for plastic ultramicro cuvettes, non-temperature controlled	Cuvette changer to accommodate 6 ultramicro cuvettes with 10 mm path length, center height 15 mm, non-temperature controlled, without stirrer. Please order cuvettes separately!	820-60333-P
	6-cell cuvette changer with 10, 20, 40 or 50 mm path length, non-temperature controlled no stirrer	Cuvette changer to accommodate 6 cuvettes with 10, 20, 40 or 50 mm path length, non-temperature controlled, without stirrer. Please order cuvettes separately!	820-60126-P
	8-cell cuvette changer, non-temperature controlled, without stirrer	Cuvette changer for the accommodation of 8 cuvettes with 10 mm path length, non-temperature controlled, without stirrer. Can be combined with the following product: ▪ 820-60275-0 Aperture baffle Please order cuvettes separately!	820-60223-P
	8-cell cuvette changer, non-temperature controlled, without stirrer (for dissolution)	Cuvette changer to accommodate 8 cuvettes with 10 mm path length, non-temperature controlled, without stirrer, special equipment for dissolution applications. Can be combined with the following product: ▪ 820-60275-0 Aperture baffle Please order cuvettes separately!	820-60232-P
	8-cell cuvette changer, non-temperature controlled, with stirrer	Cuvette changer to accommodate 8 cuvettes with 10 mm path length, non-temperature controlled, with stirrer. Can be combined with the following product: ▪ 820-60275-0 Aperture baffle Only for 230 V / 50 Hz, other voltages on request.	820-60226-P
	Cuvette carousel with 15 positions, non-temperature controlled, without stirrer	Cuvette carousel to accommodate 15 cuvettes with 10 mm path length, non-temperature controlled, without stirrer. Only for the use of standard macro cuvettes. Please order cuvettes separately!	820-60202-P

Temperature-controlled cuvette holders

	Accessory	Description	Order number
	2x Peltier temperature controlled cuvette holder, air-cooled, (10 °C to 60 °C)	To accommodate a cuvette each for sample and reference with 10 mm path length ▪ Peltier temperature controlled from 10 °C to 60 °C at 25 °C room temperature ▪ temperature accuracy +/- 0.1 °C ▪ air-cooled ▪ temperature control in block and cuvette via software ▪ integrated magnetic stirrer ▪ temperature sensor for cuvettes with stopper ▪ footprint of external temperature control unit: 225 x 200 mm Can be combined with the following products: ▪ 820-60337-P Adapter for temperature probe for cuvettes with 10 mm path length and lid ▪ 820-60271-0 Temperature probe and adapter for ultramicro cuvettes (set) with round stopper Only for SPECORD 2xx PLUS. Only for 230 V / 50 Hz, other voltages on request. Please order cuvettes separately!	820-60266-P
	2x Peltier temperature-controlled cuvette holder, air-cooled, (-5 °C to 105 °C)	To accommodate a cuvette each for sample and reference with 10 mm path length ▪ Peltier temperature controlled from -5 °C to 105 °C at 25 °C room temperature ▪ temperature accuracy +/- 0.1 °C ▪ air-cooled ▪ temperature control in block and cuvette via software ▪ temperature sensor for cuvettes with stopper ▪ footprint of external temperature control unit: 225 x 200 mm Can be combined with the following products: ▪ 820-60337-P Adapter for temperature probe for cuvettes with 10 mm path length and lid ▪ 820-60271-0 Temperature probe and adapter for ultramicro cuvettes (set) with round stopper Only for SPECORD 2xx PLUS. Only for 230 V / 50 Hz, other voltages on request. Please order cuvettes separately!	820-60265-P
	2x Peltier temperature-controlled cuvette holder with external heat exchanger	To accommodate a cuvette each for sample and reference with 10 mm path length ▪ Peltier temperature-controlled from -10 °C to 105 °C at 25 °C room temperature ▪ temperature accuracy +/- 0.1 °C ▪ liquid cooled with external heat exchanger ▪ temperature control in block and cuvette via software ▪ integrated magnetic stirrer ▪ temperature sensor for cuvettes with stopper ▪ footprint of external heat exchanger: 225 x 200 mm Can be combined with the following products: ▪ 820-60337-P Adapter for temperature probe for cuvettes with 10 mm path length and lid ▪ 820-60271-0 Temperature probe and adapter for ultramicro cuvettes (set) with round stopper Only for SPECORD 2xx PLUS. Only for 230 V / 50 Hz, other voltages on request. Please order cuvettes separately!	820-60249-P

	Holder for cuvettes from 10 to 50 mm, temperature controlled, without stirrer	To accommodate a cuvette with 10 to 50 mm path length, temperature controlled by an external liquid thermostat Can be combined with the following products: ▪ 820-60145-0 External liquid thermostat A6 ▪ 820-60147-0 External liquid cooling thermostat RA 8 Please order cuvettes and thermostat separately!	820-60174-0
	Holder for standard cuvettes, temperature controlled, with stirrer	To accommodate a cuvette with 10 mm path length, temperature controlled by an external liquid thermostat, with integrated magnetic stirrer Can be combined with the following products: ▪ 820-60145-0 External liquid thermostat A6 ▪ 820-60147-0 External liquid cooling thermostat RA 8 Only for 230 V / 50 Hz, other voltages on request. Please order cuvettes and thermostat separately!	820-60143-0
	Holder for standard cuvettes, temperature controlled without stirrer	To accommodate a cuvette with 10 mm path length, temperature controlled by an external liquid thermostat Can be combined with the following products: ▪ 820-60145-0 External liquid thermostat A6 ▪ 820-60147-0 External liquid cooling thermostat RA 8 Please order cuvettes and thermostat separately!	820-60142-0
	Peltier temperature-controlled cuvette holder for SPECORD 2xx PLUS, air-cooled, (-10 °C to 105 °C)	To accommodate a cuvette with 10 mm path length ▪ Peltier temperature-controlled from -10 °C to 105 °C at 25 °C room temperature ▪ temperature accuracy +/- 0.1 °C ▪ air-cooled ▪ temperature control in block and cuvette via software ▪ integrated magnetic stirrer ▪ temperature sensor for cuvettes with stopper ▪ footprint of external temperature control unit: 225 x 200 mm Can be combined with the following products: ▪ 820-60337-P Adapter for temperature probe for cuvettes with 10 mm path length and lid ▪ 820-60271-0 Temperature probe and adapter for ultramicro cuvettes (set) with round stopper Only for SPECORD 2xx PLUS. Only for 230 V / 50 Hz, other voltages on request. Please order cuvettes separately!	820-60263-P
	Peltier temperature-controlled cuvette holder for SPECORD 50 PLUS, air-cooled, (10 °C to 60 °C)	To accommodate a cuvette with 10 mm path length ▪ Peltier temperature-controlled from 10 °C to 60 °C at 25 °C room temperature ▪ temperature accuracy +/- 0.1 °C ▪ air-cooled ▪ temperature control in block and cuvette via software ▪ integrated magnetic stirrer ▪ temperature sensor for cuvettes with stopper footprint of external temperature control unit: 225 x 200 mm Can be combined with the following products: ▪ 820-60337-P Adapter for temperature probe for cuvettes with 10 mm path length and lid ▪ 820-60271-0 Temperature probe and adapter for ultramicro cuvettes (set) with round stopper Only for SPECORD 50 PLUS. Only for 230 V / 50 Hz, other voltages on request. Please order cuvettes separately!	820-60336-P

	Peltier temperature-controlled cuvette holder for SPECORD 50 PLUS, air-cooled, (-5 °C to 105 °C)	To accommodate a cuvette with 10 mm path length ▪ Peltier temperature-controlled from -5 °C to 105 °C at 25 °C room temperature ▪ temperature accuracy +/- 0.1 °C ▪ air-cooled ▪ temperature control in block and cuvette via software ▪ integrated magnetic stirrer ▪ temperature sensor for cuvettes with stopper ▪ footprint of external temperature control unit: 225 x 200 mm Can be combined with the following products: ▪ 820-60337-P Adapter for temperature probe for cuvettes with 10 mm path length and lid ▪ 820-60271-0 Temperature probe and adapter for ultramicro cuvettes (set) with round stopper Only for SPECORD 50 PLUS. Only for 230 V / 50 Hz, other voltages on request. Please order cuvettes separately!	820-60273-P
	Peltier temperature-controlled cuvette holder with external heat exchanger	To accommodate a cuvette with 10 mm path length ▪ Peltier temperature-controlled from -10 °C to 105 °C at 25 °C room temperature ▪ temperature accuracy +/- 0.1 °C ▪ liquid cooled with external heat exchanger ▪ temperature control in block and cuvette via software ▪ integrated magnetic stirrer ▪ temperature sensor for cuvettes with stopper ▪ footprint of external heat exchanger: 225 x 200 mm Can be combined with the following products: ▪ 820-60337-P Adapter for temperature probe for cuvettes with 10 mm path length and lid ▪ 820-60271-0 Temperature probe and adapter for ultramicro cuvettes (set) with round stopper Only for 230 V / 50 Hz, other voltages on request. Please order cuvettes separately!	820-60248-P
	Peltier temperature-controlled holder for SPECORD 2xx PLUS, air-cooled, (10 °C to 60 °C)	To accommodate a cuvette with 10 mm path length ▪ Peltier temperature-controlled from 10 °C to 60 °C at 25 °C room temperature ▪ temperature accuracy +/- 0.1 °C ▪ air-cooled ▪ temperature control in block and cuvette via software ▪ integrated magnetic stirrer ▪ temperature sensor for cuvettes with stopper ▪ footprint of external temperature control unit: 225 x 200 mm Can be combined with the following products: ▪ 820-60337-P Adapter for temperature probe for cuvettes with 10 mm path length and lid ▪ 820-60271-0 Temperature probe and adapter for ultramicro cuvettes (set) with round stopper Only for SPECORD 2xx PLUS. Only for 230 V / 50 Hz, other voltages on request. Please order cuvettes separately!	820-60264-P

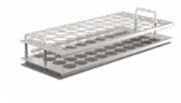
Temperature-controlled cuvette changers

	Accessory	Description	Order number
	6-cell cuvette changer, temperature controlled, without stirrer	Cuvette changer to accommodate 6 cuvettes with 10 mm path length, temperature controlled by an external liquid thermostat, without stirrer. Can be combined with the following products: ▪ 820-60145-0 External liquid thermostat A6 ▪ 820-60147-0 External liquid cooling thermostat RA 8 ▪ 820-60275-0 Aperture baffle Please order cuvettes and thermostat separately!	820-60125-P
	6-cell cuvette changer, temperature controlled, with stirrer	Cuvette changer to accommodate 6 cuvettes with 10 mm path length, temperature controlled by an external liquid thermostat, with stirrer. Can be combined with the following products: ▪ 820-60145-0 External liquid thermostat A6 ▪ 820-60147-0 External liquid cooling thermostat RA 8 ▪ 820-60275-0 Aperture baffle Only for 230 V / 50 Hz, other voltages on request. Please order cuvettes and thermostat separately!	820-60149-P
	8-cell cuvette changer, temperature controlled, without stirrer	Cuvette changer to accommodate 8 cuvettes with 10 mm path length, temperature controlled by an external liquid thermostat, without stirrer. Can be combined with the following products: ▪ 820-60145-0 External liquid thermostat A6 ▪ 820-60147-0 External liquid cooling thermostat RA 8 ▪ 820-60275-0 Aperture baffle Please order cuvettes and thermostat separately!	820-60224-P
	8-cell cuvette changer, temperature controlled, with stirrer	Cuvette changer to accommodate 8 cuvettes with 10 mm path length, temperature controlled by an external liquid thermostat, with stirrer. Can be combined with the following products: ▪ 820-60145-0 External liquid thermostat A6 ▪ 820-60147-0 External liquid cooling thermostat RA 8 ▪ 820-60275-0 Aperture baffle Only for 230 V / 50 Hz, other voltages on request. Please order cuvettes and thermostat separately!	820-60227-P
	Peltier temperature-controlled 2x6-cell cuvette changer with external heat exchanger, without stirrer	Cuvette changer to accommodate 6 cuvettes each with 10 mm path length ▪ Peltier temperature-controlled from -5 °C to 105 °C at 25 °C room temperature ▪ temperature accuracy +/- 0.1 °C ▪ liquid cooled with external heat exchanger ▪ temperature control in block and cuvette via software ▪ temperature sensor for cuvettes with stopper ▪ footprint of external heat exchanger: 225 x 200 mm Can be combined with the following products: ▪ 820-60337-P Adapter for temperature probe for cuvettes with 10 mm path length and lid ▪ 820-60271-0 Temperature probe and adapter for ultramicro cuvettes (set) with round stopper Only for SPECORD 2xx PLUS! Only for 230 V / 50 Hz, other voltages on request. Please order cuvettes separately!	820-60278-P

	Peltier temperature-controlled 2x6-cell cuvette changer with external heat exchanger, with stirrer	Cuvette changer to accommodate 6 cuvettes each with 10 mm path length ▪ Peltier temperature-controlled from -5 °C to 105 °C at 25 °C room temperature ▪ temperature accuracy +/- 0.1 °C ▪ liquid cooled with external heat exchanger ▪ temperature control in block and cuvette via software ▪ integrated magnetic stirrer ▪ temperature sensor for cuvettes with stopper ▪ footprint of external heat exchanger: 225 x 200 mm Can be combined with the following products: ▪ 820-60337-P Adapter for temperature probe for cuvettes with 10 mm path length and lid ▪ 820-60271-0 Temperature probe and adapter for ultramicro cuvettes (set) with round stopper Only for SPECORD 2xx PLUS! Only for 230 V / 50 Hz, other voltages on request. Please order cuvettes separately!	820-60279-P
	Peltier temperature-controlled 2x8-cell cuvette changer with external heat exchanger, without stirrer	Cuvette changer to accommodate 8 cuvettes each with 10 mm path length ▪ Peltier temperature-controlled from -5 °C to 105 °C at 25 °C room temperature ▪ temperature accuracy +/- 0.1 °C ▪ liquid cooled with external heat exchanger ▪ temperature control in block and cuvette via software ▪ temperature sensor for cuvettes with stopper ▪ footprint of external heat exchanger: 225 x 200 mm Can be combined with the following products: ▪ 820-60337-P Adapter for temperature probe for cuvettes with 10 mm path length and lid ▪ 820-60271-0 Temperature probe and adapter for ultramicro cuvettes (set) with round stopper Only for SPECORD 2xx PLUS! Only for 230 V / 50 Hz, other voltages on request. Please order cuvettes separately!	820-60231-P
	Peltier temperature-controlled 2x8-cell cuvette changer with external heat exchanger, with stirrer	Cuvette changer to accommodate 8 cuvettes with 10 mm path length ▪ Peltier temperature-controlled from -5 °C to 105 °C at 25 °C room temperature ▪ temperature accuracy +/- 0.1 °C ▪ liquid cooled with external heat exchanger ▪ temperature control in block and cuvette via software ▪ integrated magnetic stirrer ▪ temperature sensor for cuvettes with stopper ▪ footprint of external heat exchanger: 225 x 200 mm Can be combined with the following products: ▪ 820-60337-P Adapter for temperature probe for cuvettes with 10 mm path length and lid ▪ 820-60271-0 Temperature probe and adapter for ultramicro cuvettes (set) with round stopper Only for SPECORD 2xx PLUS! Only for 230 V / 50 Hz, other voltages on request. Please order cuvettes separately!	820-60239-P

	Peltier temperature-controlled 6-cell cuvette changer with external heat exchanger, without stirrer	Cuvette changer to accommodate 6 cuvettes with 10 mm path length ▪ Peltier temperature-controlled from -5 °C to 105 °C at 25 °C room temperature ▪ temperature accuracy +/- 0.1 °C ▪ liquid cooled with external heat exchanger ▪ temperature control in block and cuvette via software ▪ temperature sensor for cuvettes with stopper ▪ footprint of external heat exchanger: 225 x 200 mm Can be combined with the following products: ▪ 820-60337-P Adapter for temperature probe for cuvettes with 10 mm path length and lid ▪ 820-60271-0 Temperature probe and adapter for ultramicro cuvettes (set) with round stopper Only for 230 V / 50 Hz, other voltages on request. Please order cuvettes separately!	820-60282-P
	Peltier temperature-controlled 6-cell cuvette changer with external heat exchanger, with stirrer	Cuvette changer to accommodate 6 cuvettes with 10 mm path length ▪ Peltier temperature-controlled from -5 °C to 105 °C at 25 °C room temperature ▪ temperature accuracy +/- 0.1 °C ▪ liquid cooled with external heat exchanger ▪ temperature control in block and cuvette via software ▪ integrated magnetic stirrer ▪ temperature sensor for cuvettes with stopper ▪ footprint of external heat exchanger: 225 x 200 mm Can be combined with the following products: ▪ 820-60337-P Adapter for temperature probe for cuvettes with 10 mm path length and lid ▪ 820-60271-0 Temperature probe and adapter for ultramicro cuvettes (set) with round stopper Only for 230 V / 50 Hz, other voltages on request. Please order cuvettes separately!	820-60283-P
	Peltier temperature-controlled 8-cell cuvette changer with external heat exchanger, without stirrer	Cuvette changer to accommodate 8 cuvettes with 10 mm path length ▪ Peltier temperature-controlled from -5 °C to 105 °C at 25 °C room temperature ▪ temperature accuracy +/- 0.1 °C ▪ liquid cooled with external heat exchanger ▪ temperature control in block and cuvette via software ▪ temperature sensor for cuvettes with stopper ▪ footprint of external heat exchanger: 225 x 200 mm Can be combined with the following products: ▪ 820-60337-P Adapter for temperature probe for cuvettes with 10 mm path length and lid ▪ 820-60271-0 Temperature probe and adapter for ultramicro cuvettes (set) with round stopper Only for 230 V / 50 Hz, other voltages on request. Please order cuvettes separately!	820-60225-P
	Peltier temperature-controlled 8-cell cuvette changer with external heat exchanger, with stirrer	Cuvette changer to accommodate 8 cuvettes each with 10 mm path length ▪ Peltier temperature-controlled from -5 °C to 105 °C at 25 °C room temperature ▪ temperature accuracy +/- 0.1 °C ▪ liquid cooled with external heat exchanger ▪ temperature control in block and cuvette via software ▪ integrated magnetic stirrer ▪ temperature sensor for cuvettes with stopper ▪ footprint of external heat exchanger: 225 x 200 mm Can be combined with the following products: ▪ 820-60337-P Adapter for temperature probe for cuvettes with 10 mm path length and lid ▪ 820-60271-0 Temperature probe and adapter for ultramicro cuvettes (set) with round stopper Only for 230 V / 50 Hz, other voltages on request. Please order cuvettes separately!	820-60228-P

Flow measurement

	Accessory	Description	Order number
	APG basis xyz-sampler	For fully automatic quantitative sampling and analysis of up to 116 samples consecutively with minimal time and effort ▪ automatic xyz sampler ▪ samples are individually stirred ▪ stirring speed adjustable ▪ maximum Z-stroke of 145 mm ▪ footprint: 500 x 540 mm The Cassette Sipper System (820-60141-P) is required for connection to the photometer! Please order sample rack and Cassette Sipper System separately!	820-60300-0
	Cassette sipper system	To measure liquid samples in continuous flow without having to change the measuring cuvette. Multiple samples can be measured rapidly one after the other via suction tube and flow cell. consisting of: ▪ adjustable holder for cuvettes with 10, 20, 40 or 50 mm path length ▪ integrated ISMATEC pump head ▪ hoses for peristaltic pump ▪ center height 8.5 or 15 mm Can be combined with the following product: ▪ 820-60300-0 APG basis xyz-sampler Please order flow cells separately!	820-60141-P
	Sample rack 116 positions	Rack for 116 sample vials with 12 mL each for APG basis xyz-sampler ▪ 250 test tubes included The APG basis xyz-sampler (820-60300-0) is required for connection to the photometer! Please order APG basis xyz-sampler separately!	820-60301-0
	Sample rack 49 positions	Rack for 49 sample vials with 50 mL or 100 mL each for APG basis xyz-sampler ▪ 100 sample vials with each 100 mL included ▪ 50 magnetic stirring bars included The APG basis xyz-sampler (820-60300-0) is required for connection to the photometer! Can be combined with the following products: ▪ 402-000.005 Sample vials 50 mL for APG 64, 80 x 33 mm ▪ 402-890.101 Sample vials 100 mL for AS vario rack 52 and APG 49, 145 x 34 mm Please order APG basis xyz-sampler separately!	820-60302-0
	Sample rack 64 positions	Rack for 64 sample vials with 30 mL each for APG basis xyz-sampler ▪ 100 sample vials with 30 mL each included ▪ 70 magnetic stirring bars included The APG basis xyz-sampler (820-60300-0) is required for connection to the photometer! Can be combined with the following product: ▪ 402-886.319 Sample vials 30 mL for APG 64, 78 x 28 mm Please order APG basis xyz-sampler separately!	820-60295-0

Solids analysis

	Accessory	Description	Order number
	Holder for contact lenses	To determine the transmittance of contact lenses. The holder is suitable for contact lenses of different diameters (10 mm, 11.5 mm and 14.2 mm). The holder for solid samples (820-60090-0) is required for connection to the photometer! Please order holder for solid samples separately!	820-60334-P
	Holder for solid samples for films or sample plates	To accommodate transparent films or sample plates. Sample dimension: from 17 mm in diameter and up to 25 mm in thickness (path length) Maximum sample dimension: 80 x 140 mm Special adapter for samples with 9 mm diameter is included. Can be combined with the following product: ▪ 820-60334-P Holder for contact lenses	820-60090-0
	Integrating sphere	To measure the transmission and diffuse reflection of liquid, solid and powdered samples ▪ Wavelength range: 200 - 1100 nm ▪ Inside diameter: 75 mm ▪ Illumination angle for reflection: 8° ▪ Sphere is applicable in 2 positions Can be combined with the following product: ▪ 820-60233-0 Standard set Diffuse Reflection ▪ 820-60303-0 Filter paper for Integrating sphere	820-60139-P
	Measuring insert for absolute reflectance	To determine the absolute reflectance on flat surfaces or layers by means of V-W beam arrangement ▪ angle of reflection: 7° ▪ sample size: 34 mm² to 130 mm² Can be combined with the following products: ▪ 820-60307-0 Sample holder (diameter 20 mm) for measuring insert for absolute reflectance ▪ 820-60308-0 Sample holder (diameter 25 mm) for measuring insert for absolute reflectance ▪ 820-60309-0 Sample holder (diameter 25.4 mm) for measuring insert for absolute reflectance	820-60172-P
	Measuring insert for reflection with variable angle 11° - 60°	To investigate the reflection measurements of solid surfaces, films and their interfaces under different reflection angles ▪ adjustable in the range from 11° to 60° ▪ angular adjustment interval 1° ▪ sample size min. 12 x 10 mm ▪ specimen thickness max. 30 mm ▪ illuminated specimen area 2.5 x 6 mm (60°) to 2.5 x 12 mm (11°) ▪ 1 mirror as reference specimen ▪ 1 sample table 70 x 80 mm ▪ 1 sample table 115 x 80 mm	820-60173-P
	Sample holder (diameter 20 mm) for measuring insert for absolute reflectance	To determine the absolute reflectance for samples with 20 mm diameter The measuring insert for absolute reflectance (820-60172-P) is required for connection to the photometer! Please order measuring insert for absolute reflectance separately!	820-60307-0
	Sample holder (diameter 25.4 mm) for measuring insert for absolute reflectance	To determine the absolute reflectance for samples with 25.4 mm (10 inch) diameter The measuring insert for absolute reflectance (820-60172-P) is required for connection to the photometer! Please order measuring insert for absolute reflectance separately!	820-60309-0
	Sample holder (diameter 25 mm) for measuring insert for absolute reflectance	To determine the absolute reflectance for samples with 25 mm diameter The measuring insert for absolute reflectance (820-60172-P) is required for connection to the photometer! Please order measuring insert for absolute reflectance separately!	820-60308-0

	Scanning attachment for solid samples	To determine locally resolved transmission spectra for large-area, solid and transparent samples.	820-60262-P

Fiber-optic coupling

	Accessory	Description	Order number
	Standard Immersion Probe	Stainless steel immersion probe with 10 mm path length and collimator connection Other immersion probes on request. The set collimator fiber-optic coupling (820-60131-0) is required for connection to the photometer! Please order set collimator Fiber optic coupling separately!	820-60199-0
	Collimator fiber-optic coupling set	To examine samples by means of immersion probes outside the photometer in external containers consisting of: ▪ adjustable holder (820-60137-0) ▪ fiber adapter center height 8.5 mm ▪ optical fibers Collimator/Collimator Can be combined with the following product: ▪ 820-60199-0 Standard Immersion probe Please order immersion probe separately!	820-60131-0
	SMA fiber-optic coupling set	To examine samples by means of immersion probes outside the photometer in external containers consisting of: ▪ adjustable holder (820-60137-0) ▪ fiber adapter center height 8.5 mm ▪ optical fibers Collimator/SMA ▪ coupling element Please order SMA immersion probe separately!	820-60203-0

Other accessories

	Accessory	Description	Order number
	Adapter for temperature probe for cuvettes with 10 mm path length and lid	Adapter for temperature sensor for use of cuvettes with 10 mm path length and lid with Peltier temperature-controlled accessories. Can be combined with all Peltier temperature-controlled cuvette holders and cuvette changers. Please order cuvettes and temperature-controlled accessories separately!	820-60337-P
	Aperture baffle	Enables measurements of micro cuvettes without black walls in cuvette changers, with three different aperture baffles. Please order cuvettes and cuvette changers separately!	820-60275-0
	External liquid cooling thermostat RA 8	For use with temperature-controlled accessories ▪ temperature range from -25 °C to 85 °C ▪ temperature constancy +/- 0.05 °C ▪ heating power 1.5 kW ▪ bath volume 3 - 7.5 L ▪ digital temperature display Thermostats with other temperature ranges on request. Please order temperature-controlled accessories separately!	820-60147-0

	External liquid thermostat A6	For use with temperature-controlled accessories ▪ temperature range from 25 °C to 85 °C ▪ temperature accuracy +/- 0.05 °C ▪ heating power 1.5 kW ▪ bath volume 2.5 - 5.5 L ▪ analog temperature display Thermostats with other temperature ranges on request. Please order temperature-controlled accessories separately!	820-60145-0
	Temperature probe and adapter for ultramicro cuvettes (set)	Temperature sensor and adapter for use with ultramicro cuvettes with Peltier temperature-controlled accessories. Can be combined with all Peltier temperature-controlled cuvette holders and cuvette changers. Please order cuvettes separately!	820-60271-0
	Base plate for adapting special accessories to sample compartment rods	As base plate for own constructions.	820-60314-0
	Base plate with aperture baffle	Enables measurements of micro or semi-micro cuvettes without black walls in the standard cuvette holder, includes three different aperture baffles, use as base plate for own setups when the aperture baffle is removed. Please order cuvettes separately!	820-60272-0
	Aluminum spacer – 5 mm	For use with cuvettes with 5 mm path length inside cuvette holders for 10 mm path length.	820-70083-0
	Dust cover for SPECORD PLUS	Made of fabric	820-60055-P
	Universal holder for all sample holders and cuvette holders	To accommodate a sample holder or cuvette holder at a variable position in the sample compartment, only required if the existing holder on the sample compartment wall is not sufficient. Can be combined with the following product: ▪ 820-60170-0 Holder for absorption tube for larger samples Please order cuvettes separately!	820-60171-0

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