

50 YEARS

SPECTORD®

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SPECTORD® Accessories

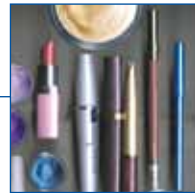
Unique flexibility in molecular spectroscopy



SPECORD® inspires!

The SPECORD® PLUS series and the SPECORD® S system offer the right solution for numerous applications. Routine analysis or special applications in chemistry, pharmacy, medicine, food, environment, life science and many other areas – with SPECORD® and the comprehensive range of accessories you are well prepared for all requirements.

Cell holder, cell changer, flow cell systems, reflectance accessories or fiber coupling – the SPECORD® accessories allow a broad area of application, the automation of analysis processes and performing special applications.



Made in Germany

Technology
Quality
Innovation

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Validation package

To provide tests of device parameters of your SPECORD® in compliance with internal or external quality standards, such as Ph.Eur., USP, TGA and ASTM and to ensure correct and accurate results, the SPECORD® PLUS series and the SPECORD® S system offer a special software for validation. Thus you are free to decide whether to perform the device validation yourself or have it done by qualified experts of Analytik Jena AG.



The following parameters can be tested individually or together:

- Zero transmission
- Baseline stability
- Baseline noise
- Photometric accuracy in UV and Vis range
- Wavelength accuracy
- Wavelength reproducibility
- Stray light
- Resolution
- Long-term stability

In addition to the possibility of an electronic record of the validation documentation you are free to choose among several masters for a print out of the results as a brief protocol or a complete measurement protocol.



Cell holder

The accessories for the SPECORD® photometers include a comprehensive range of holders for diverse types of cells. Most of them offer a temperature control, alternatively with waterbath or Peltier element. The Peltier temperature control permits a very precise analysis. The temperature is detected directly in the cell via sensor and can be regulated as precise as ± 0.1 °C. Measurements at fixed wavelengths but also temperature ramps can be controlled by the software WinASPECT® PLUS or WinASPECT®.

With this accessory amplification the photometers of SPECORD® are excellently qualified for kinetics, enzyme kinetics, for DNA/RNA analyses and all applications where a very precise temperature control is necessary.

The holder for cylindrical cells allows the analysis of gaseous and liquid samples, which afford a pressure resistant cell material.

An increase of the sensitivity of the measurement by using high path lengths can be achieved by using the holder for cells up to 100 mm.

The adjustable cell holder permits the use of micro and ultra micro cells. Those are especially well suited for bio analytics where often only small sample volumes can be provided, e.g. determination of DNA purity. The alignment of those cell holders guarantees that the light beam has an optimal way through the cell.

The thermostatted cell holder with or without stirrer can be used for enzyme kinetics e.g. the determination of ascorbic acid in food and other matrices. The Peltier thermostatted cell holders guarantee a very precise tempering e.g. for DNA/RNA analysis, DNA melting curves or enzyme kinetics at fixed temperatures.

Holder for round cells

Temperature control via Peltier element





Thermostatted cell holder



Adjustable cell holder



Position for turbid samples

The holder for round cells is applicable for the determination of diverse round cells, vials, test tubes or test kits. With the ready-made test kits quantitative determinations of a lot of elements and chemical compounds can be done fast and easily. This way for example the chemical oxygen demand (COD) can be determined reliably in next to no time.

Many applications in environmental analysis as the determination of water, sewage and soil are carried out comfortably using the accessories and test kits. The special module for water analysis within the WinASPECT® PLUS or WinASPECT® software simplifies numerous water determinations considerably. This includes for example preprogrammed methodes for 167 Test Kits of MERCK.

Thus lot's of parameters can be analyzed in no time at all, e.g.:

Aluminium	Alcohol	Ammonium	Arsenic	BOD
Boron	Bromine	Cadmium	Calcium	Chlorine
COD	Copper	Cyanide	Fluoride	Gold
Iodine	Iron	Lead	Manganese	Magnesium
Molybdenum	Nickel	Nitrate	Nitrite	Nitrogen
Oxygen	Ozon	Phenol	Phosphate	Potassium
Residual hardness	Silica	Silver	Sodium	Sulfate
Sulfide	Sulfite	Surfactants (anionic)	Tin	Zinc

Cell changer

Qualitative or quantitative determinations – cell changers offer a high sample throughput in routine analysis. They rationalize the measurement and monitoring of multiple samples over a certain analysis period, the measurement of enzyme kinetics or the determination of the speed of a chemical reaction. The cell changers are available with or without temperature control and/or stirring function. Moreover they can be obtained with the option to adapt a dissolution system.

In pharmacy cell changers are well suited for easy and fast measurements in routine analysis. In research and development they are applied for the screening of active ingredients, purity control or dissolution tests. Furthermore they are used in incoming goods inspection and quality control of the products, e.g. the determination of the concentration of active ingredients. In this field of application for example several UV protectors in sunscreens can be determined with the aid of the 15 cell carousel.

The temperature control of the cell changers allows a high sample throughput for example in medical or bio analytical analysis as DNA melting curves, purity control or protein analyses.

Reactions with changes in concentration over a certain period as enzyme kinetics are done easily and com-

fortably with the aid of test kits and the cell changer. In normal mode the sample of one position is measured for the complete kinetic before the measurement of the next sample starts. Within the software you are able to choose a simultaneous measurement of large sample series as well. All samples of the series are measured directly one after the other for each cycle of the kinetic. This way the measurement period of longsome enzyme kinetics as for example cholesterol with more than one hour, can still be performed in the same time also for sample series with for instance 14 samples.

An abstract of the chemical compounds which can be determined via enzyme kinetics:

Food

Acetate	Citric acid	Cholesterol	D-Glucose/ Fructose/ Saccharose
D/L-Lactate	Ethanol	Iso citric acid	Lactose/ D-Galactose
Nitrate	Starch	Sorbitol/ Xylitol	Sulfite

Medicine

Ammonia/ urea	PBG	Bile acid	Alkaline phosphatase
Free fatty acids	G-6-PDH	Catalase	Lactate
ALA	Porphyrin	Pyruvate	Triglyceride

*PBG: Porphobilinogene

*ALA: Aminolevulinic acid

*G-6-PDH: Glutamate-6-Pyruvate dehydrogenase



2 x 8 cell changer



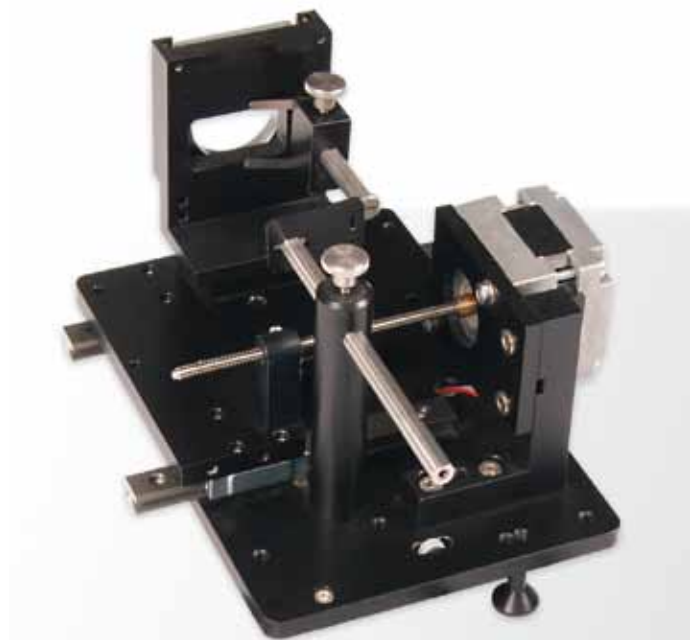
15 cell carousel

The 6 cell changer provides for example applications in food analysis. It enables a high sample throughput e.g. for MEBAK and EBC conforming brewery analysis (MEBAK – central- European brewery technological analysis commission, EBC – European Brewery Convention). Using the special software module for brewery analysis the determination of free amino nitrogen, color, total polyphenole, anthocyanogene, bitter substances, alpha acid, vicinal diketone, iodine, sulfite or ethanol can be made easily.

Moreover the cell changers can be used flexibly in a lot of other fields of application as chemistry or materials research, e.g. for the analysis of phosphorus in copper or brass. Furthermore several determinations concerning the RoHS guidelines (Restriction of the use of certain hazardous substances) can be carried out, e.g. the determination of chromium (VI).

Scanning attachment for solid samples

The scanning attachment for solid samples simplifies material analysis for large surfaces. It provides locally resolved spectra for large-scale, solid, transparent samples. The spectra of the sample are recorded in user defined resolution and analyzed for a total area. This way the properties of materials, as structure or quality of coatings can be determined precisely.

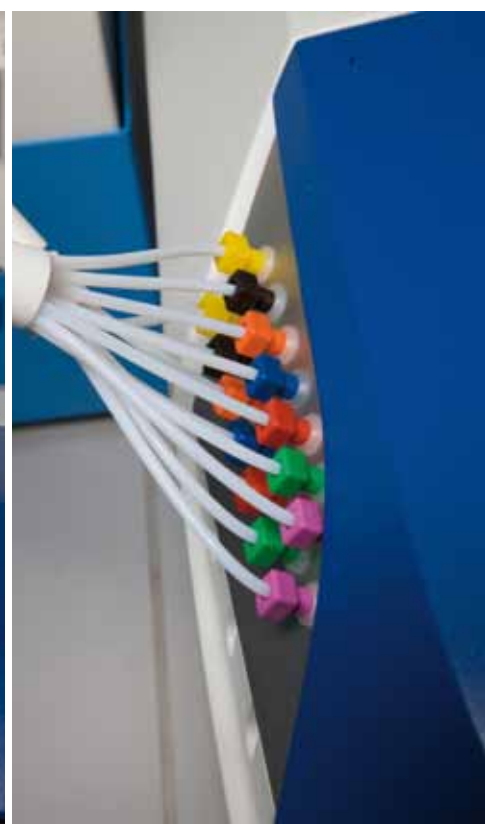


Dissolution applications

The SPECORD® PLUS dissolution are automatic test systems for online UV/Vis analysis of dissolution properties and the release of active ingredients of drugs. The variable equipment with the 8 cell changer or the 2 x 8 cell changer enable the connection of all online dissolution systems. The photometers are integrated in the respective process system software of the dissolution provider.

With all advantages of the photometer this combination offers a well thought-out, automatic dissolution system:

- Spectral range 190–1100 nm
- High performance optics
- 10-year long-term warranty
- Outstanding long-term stability due to Cooled Double Detection
- Large sample compartment with outlet-opportunity for liquids
- Conformity to all international pharmacopoeia as well as relevant standards of the FDA 21 CFR Part 11



Reflexion and remission attachments

Transmittance, reflectance, color, whiteness, haze or luminous – SPECORD® is excellently suited for the determination of optical properties. Accessories as the solid sample holder, the absolute reflectance accessory and the variable angle reflectance accessory enable a precise and comfortable analysis of those properties in solid samples.

The diffuse reflectance accessory with integrating sphere can be used for diffuse reflectance measurements of powder samples and solids with textured surfaces. Furthermore it is applicable for diffuse transmittance measurements of light scattering samples.

In combination with the special module for color measurements various color parameters can be calculated by taking different fields of view and standard

CIE illuminants into account. The basis for evaluation is the chromaticity coordinate system and the CIE Lab system. It is also possible to calculate the white/yellow index. These are required in paper and textile as well as in plastics and dye industries. They are also of interest in the field of optics and others.

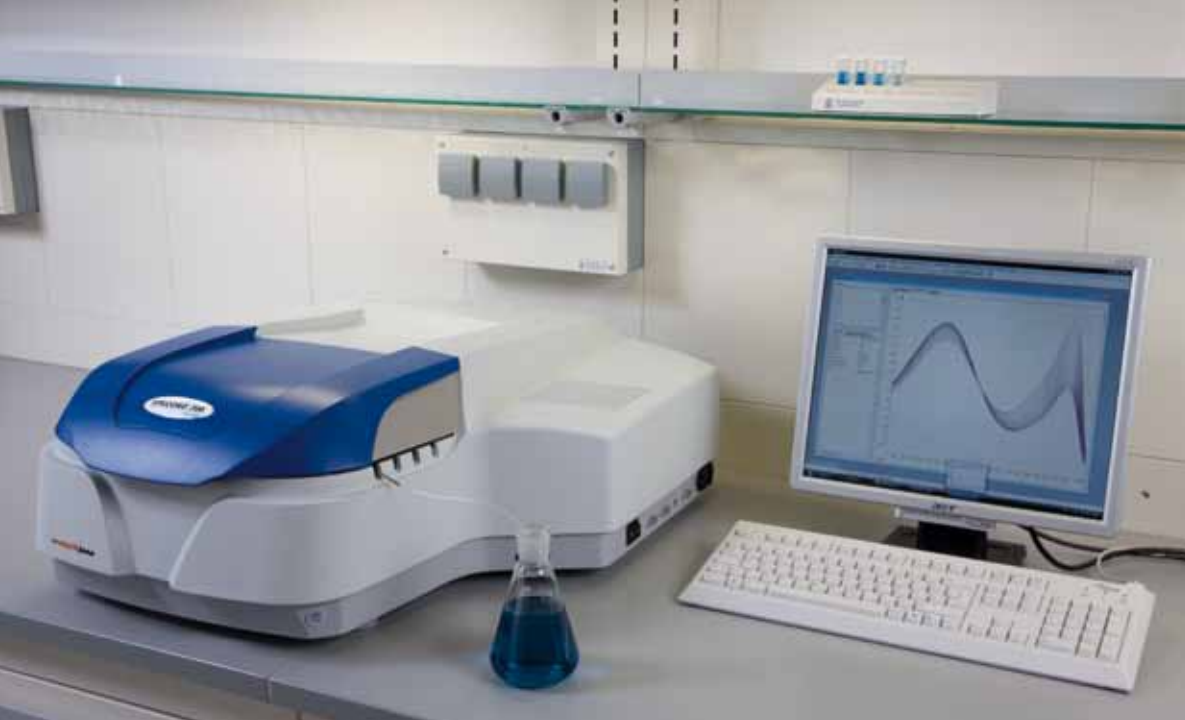
The diffuse reflectance accessory with integrating sphere is universally applicable e.g. in the determination of the white/yellow index of dental materials, equivalent applications for papers or textiles or for the characterization of sun screen agents for UVA protection. Furthermore it is best suited for transmittance measurements of transparent materials, e.g. glass, coated glass or plastic foil as well as the determination of haze and luminous transmittance of transparent plastics.

Diffuse reflectance accessory with integrating sphere

Variable angle reflectance accessory

Holder for solid samples





Sipper system

Sipper system

The sipper system is applicable for photometric determinations of all liquid or dissolved samples. Many samples can be measured one after another via aspirating tube and flow-through cell. The flow-through cell is applicable in different path lengths, as there are 1, 2 and 5 cm. To measure the sample and the reference cell simultaneously the pump can be equipped with two cassettes.

The sipper system is used for instance in environmental analysis for the quantitative determination of chemical parameters. This way drinking and surface waters are analyzed easily and cost-effectively in accordance with ASTM, ISO and EPA. In combination with additional accessories like the autosampler these determinations can be carried out even more efficiently.

Sample rack with 64 positions for autosampler



Autosampler

The xyz autosampler is equipped with an automatic stirring function. It is available with three different sample racks which provide diverse sample positions. In detail there are 49 positions for 100 ml cells, 64 positions for 30 ml cells and 116 positions for 12 ml cells. This way up to 116 samples can be measured fast and comfortably with little effort.

Fibre optic microlitre cell/TrayCell

Analysis of extremely small samples with remarkable reproducibility – TrayCell! The fibre-optic microlitre cells are especially suited for DNA/RNA or protein samples. Using the 1.0 mm or 0.2 mm cap creates a defined optical light path of 1.0 mm and 0.2 mm respectively.

This generates virtual dilution factors of 1:10 or 1:50 in comparison to a measurement with a standard 10 mm cuvette. This feature saves time and avoids dilution errors. The required sample volume for the 1.0 mm cap is 3.0 μl to 5.0 μl and for the 0.2 mm cap 0.7 μl to 4.0 μl .

The TrayCell is easily applicable with the SPECORD® cell holder and can be used for the analysis of nucleic acids, the determination of the incorporation frequency of fluorescent dye labels (FOI), protein

TrayCell



analysis (A280, BCA, Bradford, Lowry etc.) and all UV/Vis analyses utilizing the wavelength range of 190 – 1100 nm.








Optical fibre coupling


Immersion probe and fiber coupling



With the aid of optical fibre coupling samples can be analyzed with an immersion probe directly outside the photometer. Different probes available in different light paths, mini immersion probes for small sample volumes or Attenuated Total Reflection (ATR) probes can be used for diverse applications. Online measurements e.g. in waste water for UV absorption, of persistent organic compounds or of hazardous solvents can be carried out without the slightest effort. Hazards which may occur for instance when decanting samples, can be avoided.





The ATR probe is used for example in quality control of printer color in color measurements.

	Accessories	Order number
	Standard cell holder, 50 mm for accommodation of a cell of up to 50 mm pathlength	820-60087-0
	Cell holder, 100 mm for accommodation of a cell of up to 100 mm pathlength	820-60118-0
	Holder for cylindrical cells up to 50 mm for cylindrical cells having an outside diameter of 22 mm	820-60112-0
	Holder for cylindrical cells up to 100 mm for cylindrical cells having an outside diameter of 22 mm	820-60111-0
	Holder for Round Cells (variable 11 – 16 mm diameter) of the following manufactures Merck, Macherey Nagel, HACH etc.	820-60136-0
	Holder for small cells, adjustable accommodation of small cells exactly aligned to the sample beam with path length 1; 2; 5 and 10 mm with beam height 8.5 mm	820-60097-0
	Adjustable cell holder for microcells accommodation of micro and ultra micro cells exactly aligned to the sample, beam with path length 10 mm, with beam height 15 and 8.5 mm	820-60137-0
	Cell holder, 10 mm, thermostatted for cells of up to 10 mm pathlength up to 100°C through an external fluid thermostat; 4 m hose, hose connector without stirrer/with stirrer	820-60142-0/ 820-60143-0
	Cell Holder, 50 mm, thermostatted for cells of up to 50 mm pathlength up to 100°C through an external fluid thermostat; 3 m hose and 2 hose connectors	820-60174-0
	Holder for absorption tubes accommodation of absorption tubes on the universal holder	820-60170-0
	Universal holder for accommodation of accessories accommodation of cell holders in the sample compartment on the optical bench; required only, if holder at sample com- partment wall is not sufficient or the holder for the absorption tube shall be used	820-60171-0





	Accessories	Order number
	Peltier cooled* cell holder temperature range –5 °C to 105 °C (at room temperature 25 °C) for cells of up to 10 mm pathlength, integrated magnet stirrer, including controller PTC 100	
	SPECORD® S 600 system	820-60159-0
	SPECORD® 2xx PLUS system	820-60263-P
	2 x Peltier cooled* cell holder PLUS SPECORD® 2xx PLUS system	820-60265-P
	Peltier cooled* cell holder temperature range 10 °C to 60 °C (at room temperature 25 °C) for cells of up to 10 mm pathlength, integrated magnet stirrer, including controller PTC 100	
	SPECORD® S 600 system	820-60163-0
	SPECORD® 2xx PLUS system	820-60264-P
	2 x Peltier cooled* cell holder PLUS SPECORD® 2xx PLUS system	820-60266-P
	Peltier cooled* cell holder with external heat exchanging temperature range –10 °C to 105 °C (at room temperature 25 °C), for cells up to 10 mm pathlength, integrated magnet stirrer, including controller PTC 101 and heat exchanger	
	SPECORD® S 600 system	820-60248-0
SPECORD® PLUS system	820-60248-P	
2 x Peltier cooled* cell holder with external heat exchanging PLUS SPECORD® 2xx PLUS system	820-60249-P	




* The Peltier cooled accessories guarantee a temperature accuracy of ± 0.1 °C!



	Accessories	Order number
	6 cell changer 6 places for cells 10, 20, 50 mm pathlength, if cell changer is fully equipped, total process time is < 20 s	
	without stirrer SPECORD® S 600 system SPECORD® PLUS system	820-60126-0 820-60126-P
	6 cell changer, thermostatted 6 places for cells of up to 10 mm pathlength, temperature control through connection of an external fluid thermostat, if fully equipped, total process time is < 20 s	
	without stirrer/with stirrer SPECORD® S 600 system SPECORD® PLUS system	820-60125-0/ 820-60149-0 820-60125-P/ 820-60149-P
	8 cell changer 8 places for cells up to 10 mm pathlength, if fully equipped, total process time is < 25 s	
	without stirrer/with stirrer SPECORD® S 600 system SPECORD® PLUS system	820-60223-0/ 820-60226-0 820-60223-P/ 820-60226-P
	8 cell changer, thermostatted 8 places for cells up to 10 mm pathlength, if fully equipped, total process time is < 25 s	
	without stirrer/with stirrer SPECORD® S 600 system SPECORD® PLUS system	820-60224-0/ 820-60227-0 820-60224-P/ 820-60227-P
	8 cell changer, for dissolution 8 places for cells up to 10 mm pathlength, if fully equipped, total process time is < 25 s	
	SPECORD® 2xx PLUS system	820-60232-P
	Cell Carousel, not thermostatted, without stirrer 15 places for cells 10 mm pathlength	
	SPECORD® S 600 system SPECORD® PLUS system	820-60202-0 820-60202-P

	Accessories	Order number
	<p>8 cell changer, Peltier cooled* 8 places for cells up to 10 mm pathlength, temperature range –5 °C to 105 °C (room temperature 25 °C), includes Peltier control equipment PTC 800 and heat exchanging device</p> <p>without stirrer/with stirrer SPECORD® S 600 system</p> <p>SPECORD® PLUS system</p>	<p>820-60225-0/ 820-60228-0 820-60225-P/ 820-60228-P</p>
	<p>2 x 8 cell changer, Peltier cooled* 16 places for cells up to 10 mm pathlength, temperature range –5 °C to 105 °C (room temperature 25 °C), includes Peltier control equipment PTC 800 and heat exchanging device</p> <p>without stirrer/with stirrer SPECORD® 2xx PLUS system</p>	<p>820-60231-P/ 820-60239-P</p>
	<p>Solid sample holder for the accommodation of films or sample plates</p>	<p>820-60090-0</p>
	<p>Scanning attachment for solid samples changersystem for small solid samples for space-resolved determination of transmission</p>	<p>820-60262-P</p>

* The Peltier cooled accessories guarantee a temperature accuracy of ± 0.1 °C!

	Accessories	Order number
	<p>Diffuse reflectance accessory with integrating sphere inside diameter 75 mm, for transmission, diffuse reflectance measurements on liquid, solid and powder samples including: integrating sphere, storage box</p> <p>SPECORD® PLUS system</p>	<p>820-60139-P</p>
	<p>Diffuse reflectance accessory with integrating sphere inside diameter 75 mm, for diffuse reflectance measurements on liquid, solid and powder samples including: integrating sphere, power supply for external light source, base plate, storage box</p> <p>SPECORD® S 600 system</p>	<p>820-60116-0</p>
	<p>Absolute reflectance accessory determination of the absolute reflectance of flat surfaces and layers by means of V-W beam configuration, reflection angle 7°, sample size 40 x 40 mm² up to max. 70 x 70 mm², sample thickness 1 – 20 mm</p> <p>SPECORD® S 600 system SPECORD® PLUS system</p>	<p>820-60172-0 820-60172-P</p>
	<p>11°–60° Variable angle reflectance accessory reflectance measurements at variable angles of reflection, adjustable in the range 11°–60°, minimum sample size: 12 x 10 mm², maximum sample size: 80 x 230 mm², max. sample thickness: 20 mm</p> <p>SPECORD® S 600 system SPECORD® PLUS system</p>	<p>820-60173-0 820-60173-P</p>

	Accessories	Order number
	<p>Cassettesipper system for the measurement of liquids without change of sample cell including: adjustable cell holder for 10/20/50 mm pathlength, integrated ISMATEC pumphead with two cassettes, hoses for peristaltic pump, beam height: 15 mm</p>	
	SPECORD® S 600 system	820-60141-0
	SPECORD® PLUS system	820-60141-P
	<p>xyz autosampler APG 64 automatic xyz-sampler for up to 64 positions for 30 ml vials, can be combined with additional sample racks</p>	
	SPECORD® PLUS system	820-60300-0
	sample rack 116 positions for 12 ml vials	820-60301-0
	sample rack 49 positions for 100 ml vials	820-60302-0
	<p>Fiber coupling set/Hellma UV including: holder for fiber adapter, QX fiber adapter Z 8,5 1 pair of optical fibers, Type UV (240–1100 nm)</p>	
	SPECORD® S 600 system	820-60201-0
	SPECORD® PLUS system	820-60131-0
	Standard immersion probe	820-60199-0
	QX standard immersion probe (10 mm pathlength; max. immersion depth: 100 mm)	
	<p>SMA fiber coupling set including: holder for fiber adapter, SMA fiber adapter, 1 pair of optical fibers, Type UV (240–1100 nm)</p>	
	SPECORD® PLUS system	820-60203-0
	SPECORD® S 600 system	820-60200-0
	<p>Fibre optical ultra micro cell/TrayCell for measurement of small volumes 3–5 µL, optical light path 1 mm center height 15 mm</p>	820-60242-0

	Accessories	Order number
	<p>Validation software For testing all significant instrument parameters. The criteria as per Ph.Eur. are checked. Note: determination of wavelength and photometric accuracy and stray light data requires the use of a certified set of filters, certified stray light filters and certified filters for wavelengths and UV photometry</p>	<p>SPECORD® S 600 system 820-60077-0 SPECORD® PLUS system 820-60077-P</p>
	<p>Hellma test filter set, certified including: blank mount, 3 neutral density filters for photometry, 1 Holmium glass filter for wavelength tests</p>	820-60012-0
	<p>UV Standard Set-Merck/certified for validation (e.g. Ph.Eur.) including:</p> <ul style="list-style-type: none"> ▪ Stray light filters KCl, NaI, NaNO₂ UV/Vis Standard 2 1.08161.0001 NaNO₂ UV/Vis Standard 3 1.08163.0001 NaI UV/Vis Standard 4 1.08164.0001 KCl ▪ Resolution test: Toluene in n-hexane UV/Vis Standard 5 1.08165.0001 Toluene ▪ Photometry UV/Vis Standard 1 1.08160.0001 Potassium dichromate 60 mg/l UV/Vis Standard 1a 1.04660.0001 Potassium dichromate 600 mg/l 	820-60129-0
	<p>Validation set including: WinASPECT® PLUS/WinASPECT® validation software and Hellma filter set for testing wavelength and photometric accuracy in the visible spectral region</p>	<p>SPECORD® S 600 system 820-60073-0 SPECORD® PLUS system 820-60073-P</p>

Quality is the difference
Passion for details



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Subject to changes in design and scope of delivery as well as further technical development!