

SPECORD[®] S600

Simultaneous
Spectrophotometer

analytikjena

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Subject to change!

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Contents

1	Introduction	3
1.1	Intended use of the SPECORD S600	3
1.2	Notes on the User's Manual	3
2	Safety notes	5
2.1	Warning labels on SPECORD S600	5
2.2	General safety regulations	5
3	Technical Data of SPECORD S600	9
3.1	Physical-optical data	9
3.2	General technical data	10
4	Device description and operating principle	11
4.1	Mechanical design	11
4.2	Operating principle	12
5	Transport and installation requirements	15
5.1	Conditions for storage and transport	15
5.2	Installation conditions	15
6	Installation and start-up	17
6.1	Connectors and display elements	17
6.2	Connecting the SPECORD S600	18
6.3	Start-up	18
6.4	Switching off the SPECORD S600	20
7	Accessories	21
7.1	Standard cell holders	21
7.1.1	Universal holder	21
7.1.2	Cell holder	22
7.2	Further accessories	23
8	Care, maintenance, lamp change	25
8.1	Care and maintenance	25
8.2	Cleaning	25
8.3	Changing lamps	26
8.3.1	Part numbers of lamps	26
8.3.2	Note on the service life of lamps	26
8.3.3	Opening the flap of the lamp compartment	26
8.3.4	Changing the deuterium lamp	27
8.3.5	Changing the halogen lamp	28
8.4	Changing fuses	29
9	Disposal	31
10	List of illustrations	33

Contents

1 Introduction

1.1 Intended use of the SPECORD S600

The SPECORD® is a powerful, computer-controlled high-performance diode array spectrophotometer for the measurement of the transmission, absorbance, reflection as well as the energy of liquid and solid samples. It is designed for measurements in the spectral range 190 – 1020 nm.

In combination with the powerful WinASPECT® software, the SPECORD® is particularly suitable for the use in routine laboratories with a high sample throughput, but also provides solutions for special applications, if used in combination with the diverse accessories available.

1.2 Notes on the User's Manual

In this manual, the following symbols are used to refer you to warnings and notes:

**Warning!**

Warning messages alert you to a specific procedure or practice which, if not followed correctly, could cause personal injury.

**Danger! Hot surface!**

Touching the hot surface may cause burns.

**Caution!**

Caution messages refer you to procedures which, if not observed, could result in damage to the equipment.

**Dangerous electric voltage!****Emission of UV radiation!****Disconnect power cable!****Note**

This note must be followed to obtain correct measurement results.

For easier navigation within the manual, the manual uses the following system:

- Chapters and illustrations are numbered consecutively.
- Every illustration has its own caption.
- Steps of operation are numbered.
- Cross-references are marked by an arrow (e.g. →Intended use of the SPECORD S600 p.3)

Introduction

Notes on the User's Manual

2 Safety notes

2.1 Warning labels on SPECORD S600

Observe the warning labels on the SPECORD® S600!

The following warning labels have been affixed to the lamp housings of the SPECORD® S600.



Danger! UV radiation!

Do not look directly or indirectly via a mirror into the radiation emitted by the UV lamp. The lamp radiation may cause conjunctivitis!



Danger! Hot surface!

When lamps are switched on, their covers heat up strongly. If you intend to change the lamps or open the lamp covers, switch the lamps off and allow for a sufficient cool-down time.



Extremely dangerous electrical voltage!

Several parts inside the lamp housing carry electrical voltage. Therefore, before opening the lamp housing, switch off the SPECORD® S600 at the power switch and disconnect the power cable from the power outlet!

2.2 General safety regulations

For your personal safety and for a trouble-free operation, carefully read this chapter before starting up the SPECORD®.

Observe all safety notes given in this manual and all messages and notes displayed by the control software on the screen.

In addition, observe the safety notes for system components of other manufacturers (e.g. PC, printer, autosampler) supplied together with the device.



Intended use!

The SPECORD®, including original accessories, may only be used for the applications described in this manual. The manufacturer cannot assume any liability for any other application, including that of individual modules or single parts. This also applies to all service or repair work that is not carried out by authorized service personnel. All warranty claims shall be forfeited.



Local safety regulations!

Observe the local safety regulations relevant to the operation of the device (e.g. labor-safety regulations, regulations for the prevention of and protection against accidents). References to possible risks given in this manual do not replace the relevant labor-safety regulations that are to be followed.



Personnel!

The SPECORD® may only be operated by appropriately qualified and trained personnel.

For that, the knowledge of the information provided by this manual is indispensable and taken for granted.



Emergency shutdown!

In the case of emergency, disconnect the SPECORD® and its components from line power by removing the power plug from the power outlet.



Electric shocks!

The SPECORD® is electrically powered. At several parts inside the system, **extremely hazardous electrical** voltages are accessible!

To ensure Protection Class I (protective earth connection) of the device, connect the power plug of the device only to a power outlet with protective earth conductor. The protective effect must not be undone by the use of an extension cable without protective earth conductor.

Before opening the device or removing any device covers, disconnect the power cable!

Before connecting the SPECORD® to the power outlet, make sure the line voltage supplied agrees with the operating voltage specified on the rating plate at the rear panel of the device. Operation of the device with any other operating voltage than that specified may result in the destruction of the device.

Only use fuses of the specified type.



Do not operate the device in explosion-risk rooms!



UV radiation!

On the SPECORD® S600, a deuterium lamp delivers the radiation for the UV measuring range. While measurements are running, UV radiation transmits the sample compartment in the sample beam. In measurement breaks, no UV radiation is accessible there, as the sample beam is closed by a shutter. Besides, UV radiation appears in the lamp compartment. Before any lamp replacement, switch off the SPECORD® S600 and disconnect the power cable!

Never look directly or indirectly, e.g. via a mirror, into the radiation emitted by the lamp to avoid the risk of getting conjunctivitis!

Therefore, switch off the lamp for lamp replacement!

Longer exposure of the skin to UV radiation may cause skin damage!



Lamp damage!

Do not grasp functioning halogen and deuterium lamps on their glass bulbs.

Contamination on the bulb affects the radiation properties of the lamps.

Especially protect the beam-exit window of the deuterium lamp.

Make sure to remove the protective cap from the halogen bulb after having inserted it to avoid any risk of fire!

Non-observance will result in damage of the lamp.



Accumulation of heat

Heat accumulation might result in overheating and faults on the device.

Make sure not to cover the ventilation slots of the SPECORD® S600!

Before you switch on the SPECORD® S600, remove its dust cover!



Handling liquids

Take care to ensure that no liquids can enter the SPECORD® to avoid any damage to the device.



Risk of corrosion

Do not set up the device in the vicinity of aggressive vapors, e.g. strongly corrosive acid or caustic vapors! The vapors might corrode the connections, mechanical and optical components of the device.

The SPECORD[®] was produced and tested in compliance with the following standards and regulations:

- DIN EN 61010-1 (IEC 1010-1)
- 73/23/EC
- 89/336/EC.

The SPECORD[®] meets the requirements as per Protection Type IP 20.

Safety notes

General safety regulations

3 Technical Data of SPECORD S600

3.1 Physical-optical data

Technical Data	SPECORD® S 600
Optical principle	High-performance diode array for UV NIR range
Optics	Polychromator with concave holographic grating and photodiode array (1024 pixels)
Wavelength range	190-1100 nm ± 2 nm
Photometric measuring range	-3 to 3 A
Photometric display range	-4 to 4 A
Wavelength accuracy (with holmium oxide filter)*	±0.5 nm
Wavelength accuracy (D2E-peaks at 486,0 nm and 656,1 nm)	±0.3 nm
Wavelength reproducibility (with holmium oxide filter)*	±0.02 nm
Photometric accuracy VIS at 546nm with Hellma F4 neutral-density filter	±0.005 A
Photometric accuracy UV with potassium dichromate acc. to Ph.Eur.	±0.012 A
Stray light 198 nm (KCl Merck 1.08164.0001)	≤ 1.0 %T
Stray light 220 nm (NaI)	≤ 0.05 %T
Stray light 340 nm (NaNO ₂)	≤ 0.05 %T
Long-term stability at 500 nm	≤ ±0.002 A/h
UV resolution (Toluene hexane)	≥1.6
Minimum measuring time	12 ms for one spectrum

* allowing for tolerances of used standard

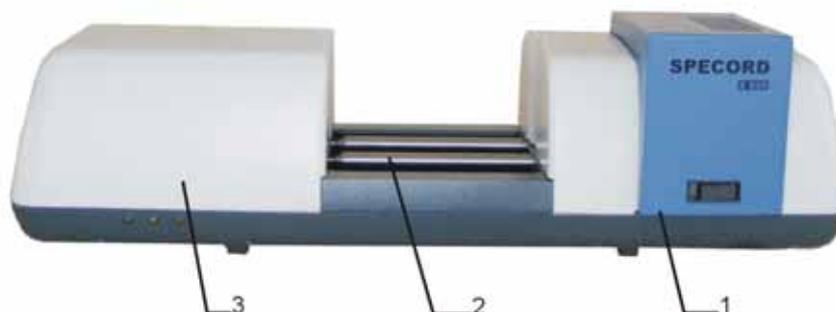
3.2 General technical data

Weight	11 kg
Footprint (W x D)	approx. 900x750 mm ² with PC
Dimensions (W x H x D)	680 x 190 x 250 mm ³
Line voltage	230 VAC ±10 % or 115 VAC ±10 % (switchable by service)
Frequency	47 ... 63 Hz
Power consumption	140 VA
Fuses: Line fuses	230 VAC: T 3.15 AH/250V, Type 19181 Wickmann 115 VAC: T 3.15 AH/250V, Type 19181 Wickmann
Radio noise suppression	EN 61326 Class B
Noise immunity	EN 61326
Protection Type	IP 20
Data interfaces	2 x RS-232 for accessories 1 x USB port for the connection of an external PC 1 x RS-232 for the connection of an external PC
PC requirements for software WinASPECT	Pentium processor 133 MHz, 16 MB RAM, Windows 2000 or Windows XP

4 Device description and operating principle

4.1 Mechanical design

The appearance of the SPECORD® S600 is marked by the lamp compartment on the right side, the central sample compartment that is open to three sides, and the polychromator section on the left side.



- 1 Lamp compartment
- 2 Sample compartment with carrier rails for holding accessories
- 3 Polychromator

Fig. 1 Mechanical design of SPECORD® S600

Unlike scanning spectrophotometers with monochromator, the optical design of the SPECORD® S600 with its polychromator requires a few moving components only and is mechanically very stable.

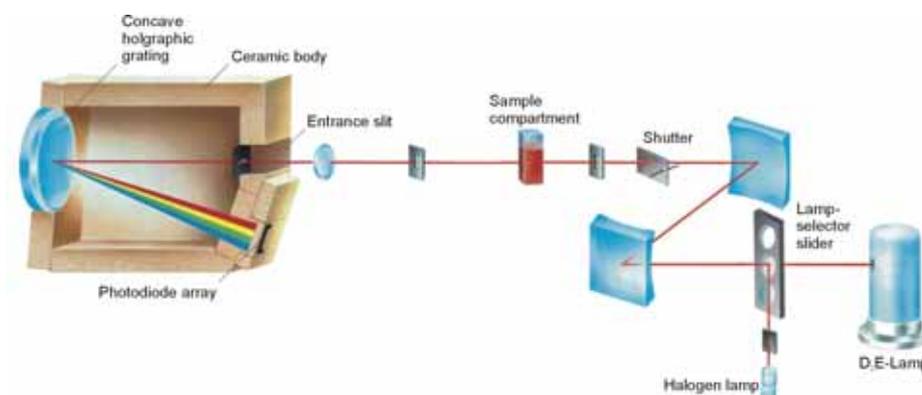


Fig. 2 Optical path of SPECORD® S600

Light sources	The light sources used are a halogen lamp for the VIS and infrared region and a deuterium lamp for the UV region. The lamp-selector slider serves to couple the light of either the halogen or the deuterium lamp, or the light of both lamps simultaneously into the optical path. In measurement breaks, lamp radiation is shut off by shutters. That way, it is possible to perform dark-current measurements and protect the sample from unnecessary radiation exposure.
Sample compartment	The optical setup with polychromator allows an open sample compartment. The bundle of rays is restricted by optical slits to the lamp compartment and the polychromator side each. The accessory units are clamped to the carrier rails of the sample compartment.
Polychromator	The polychromator used is the patented MCS module (Multi Channel System) from Carl Zeiss. The entrance slit, the imaging holographic grating and the detector are embedded in a ceramic housing.

4.2 Operating principle

The undispersed light of the halogen and/or the deuterium lamp transmits the sample and is partly absorbed by the sample. The thus altered light is spectrally dispersed in the polychromator by the holographic grating. The produced spectrum is imaged onto the diode array. The measured values of the individual photodiodes thus represent the value of intensity I over a small spectral region. As this is done in a very fast process, this type of measurement is called simultaneous.

However, reading the individual photodiodes takes a certain time (integration time). This integration time can be varied within predefined limits. The shortest integration time possible depends, inter alia, on the number of photodiodes per line. A compromise has to be made in selecting the most favorable integration time. A smaller integration time means, that there is less time for the photodiode to capture the light to be measured. The level of the measured signal will be lower and thus the signal-to-noise ratio deteriorate. On the other hand, a too high integration time may result in an intensity that exceeds the level the photodiode can receive (degree of saturation). The corresponding sections of the diode array are overdriven and the found transmission or absorbance values are wrong. However, a high integration time may be quite desirable if measurements shall be taken in low-energy regions of the spectrum (e.g. 900 – 1020 nm) and the overdriven areas are deliberately eliminated for the analysis. The system provides software-supported automatic search of integration times suitable for the analytical measuring range.

In absorption measurements, the incident intensity I_R (reference value) and the intensity I_S attenuated by the sample is measured at every wavelength of interest. Measurement is in arbitrary units, as only the ratio of both values is of importance. Quantitatively, the absorption behavior is expressed in transmission **T[%]** or absorption **A**:

However, also the dark current must be considered for result generation. The dark current is the intensity I_D of the ambient light that may enter the polychromator through the open sample compartment including the currents on the diode array caused by electronics. The intensity of the dark current must be subtracted from the intensities of sample and reference. The dark current can be measured automatically or – in very time-critical measurements – started manually. The corresponding options are to be selected along with other measurement parameters in WinASPECT[®] software.

Transmission and absorption are calculated according to the following formulas:

$$D = \frac{I_s - I_D}{I_R - I_D}$$

D	Transmission
I_R	Unattenuated intensity (reference value)
I_S	Intensity after attenuation by the sample
I_D	Dark current

$$T[\%] = D * 100$$

T[%]	Percent transmission
------	----------------------

$$A = -\lg D$$

A	Absorption
---	------------

Device description and operating principle

Operating principle

5 Transport and installation requirements

5.1 Conditions for storage and transport

For transport and storage, the following ambient conditions must be complied with:

- Temperature range in transport: -40...+70 °C
- Relative humidity in transport: up to 95 %

5.2 Installation conditions



Caution!

Do not cover the ventilation slots of the device!

Do not place any objects on the device!

Do not operate the device in explosion-risk rooms!

Keep aggressive vapors, e.g. strongly corrosive acid or caustic vapors away from the vicinity of the device.

The installation site of the SPECORD[®] must meet the following requirements:

- The place should be free of draft, dust, corrosive vapors as well as vibrations.
 - Do not set up the SPECORD[®] near electromagnetic fields (e.g. of motors).
 - Avoid dripping or splashing water near the instrument.
 - Do not expose the device to direct sunlight or the radiation of heaters.
-
- Temperature range: + 15 ... + 35 °C
 - Humidity: up to 90 % (at + 30 °C)

Considering the dimensions of the SPECORD[®] S600 and a clearance of approximately 100 mm to the sides and the front, the device needs a bench space of 880 x 450 mm².

Transport and installation requirements

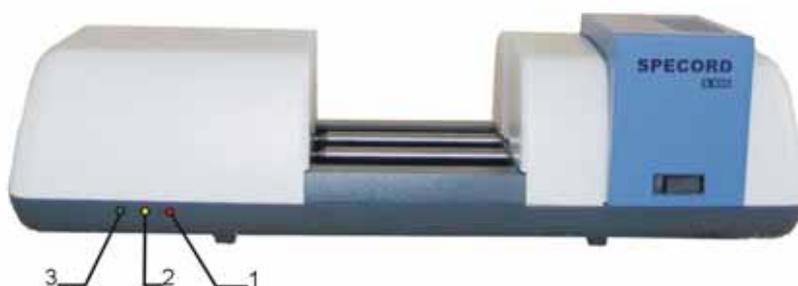
Installation conditions

6 Installation and start-up

6.1 Connectors and display elements

The connectors and display elements of the SPECORD® are arranged on its front and back wall for easy access.

The LED indicators on the left front side of the SPECORD® serve to indicate line power and lamp operation.

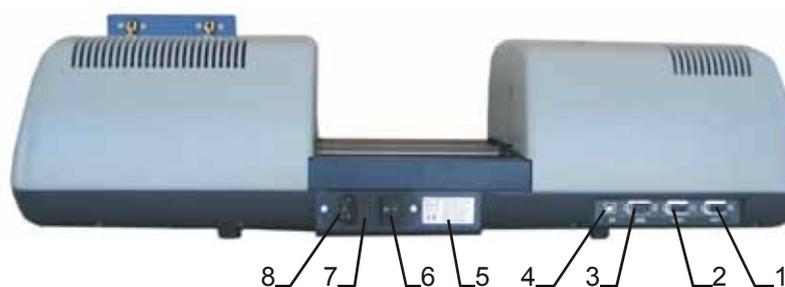


- 1 Halogen lamp ON LED (red)
- 2 D₂E lamp ON LED (yellow)
- 3 Line power ON LED (green)

Fig. 3 Display elements on front panel

The LED's light when the SPECORD® has been switched on and the lamps are on.

The power-input connector with fuse holder, the power switch, and the connectors for PC and accessories are arranged on the back panel of the device.



- | | |
|-----------------------------|-----------------------------|
| 1 Connector for accessories | 5 Type label |
| 2 Connector for accessories | 6 Power switch |
| 3 RS232 port for PC | 7 Fuse holder for line fuse |
| 4 USB port for PC | 8 Power input connector |

Fig. 4 Connectors on back panel

6.2 Connecting the SPECORD S600



Observe correct position of device!

Move the SPECORD[®] only in upright position (observe label on transport case).
Do not turn the device upside down.



Electric shock

Before connecting the SPECORD[®] and the PC to line power, make sure the available line voltage agrees with the operating voltage specified on the type labels. Operation of the devices on line voltages other than the specified operating voltage may result in their destruction.

Connecting SPECORD[®] and PC

1. Remove the device from its transport packaging and remove the plastic cover. Wait until the device has adjusted to the ambient temperature.
 2. Install the software on the PC (→ Refer to WinASPECT[®] User's Manual).
 3. Connect the SPECORD[®] S600 (→ see Connectors and display elements p.17) to the PC (free COM port or USB port) using the supplied connecting cable.
-



Note

When you use the APG 53 or APG 100 Autosampler, you must connect the PC to the USB port and the autosampler to the serial port!

4. Connect one power cable each to the SPECORD[®] S600 and the PC. Connect the power cables of the SPECORD[®] S600 and the PC to power outlets that are connected to the same phase of the line power supply (multiple socket outlet, if possible).

6.3 Start-up



Do not cover ventilation slots!

Take care to ensure that the ventilation slots on the top and on the right and left bottom of the SPECORD[®] are not covered. Do not place any objects in front of the openings. The suction intakes for the two fans on the bottom of the device must not be covered by light objects placed on the tabletop (e.g. a loose sheet of paper).

Caution in handling liquids!

Do not place any objects, especially no containers with liquids, on the SPECORD[®].

1. Start WinASPECT[®] software by a click on the program icon on the Windows desktop or by clicking the Start button on the taskbar:
Start / Programs / WinASPECT / WinASPECT



Fig. 5 WinASPECT[®] program icon

2. Switch on the SPECORD[®] at the power switch on the back panel of the device (→ Fig. 4 p. 17).
The green "Power ON" LED on the front panel of the device starts lighting (→ see Fig. 3, Display elements on front panel, p.17).
3. In WinASPECT[®] software, select the SPECORD[®] – PC port: used.
 - Activate the **Measurement / Set Parameters** menu function to open the window of the SPECORD[®] S600 device driver.

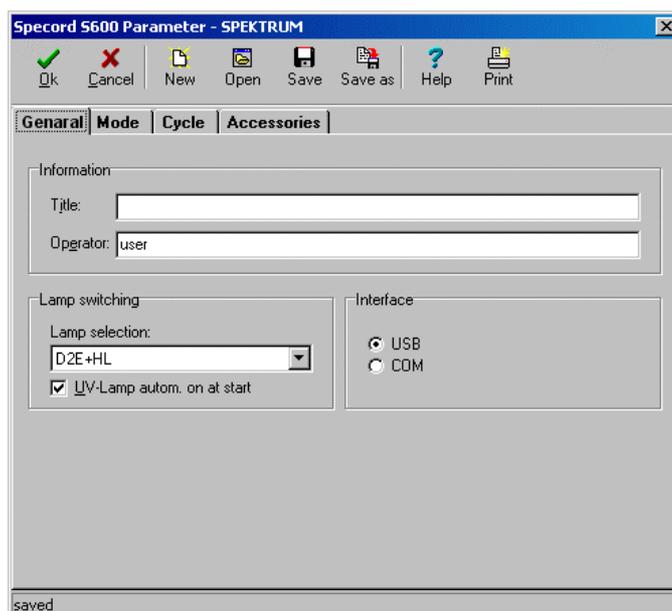


Fig. 6 Dialog box of SPECORD[®] S600 device driver

- Click on the **General** tab.
 - Choose the port of the SPECORD[®] S600, to which the PC has been connected.
 - Close the device driver window by a click on the **[OK]** button.
4. Initialize the device to establish the communication between PC and SPECORD[®] S600. For that, activate the **Measurement / Initialize Device** menu command.

The SPECORD[®] S600 is ready now for taking measurements.



Note

Consider that the SPECORD[®] S600 needs a warm-up time of one hour to reach thermal stability. Therefore, do not start high-precision measurements unless the warm-up period is over.

6.4 Switching off the SPECORD S600

1. Exit the WinASPECT[®] session using the **File / Exit** menu command.
2. The shut down the computer.
3. Finally switch off the SPECORD[®] S600 at the power switch.



Note

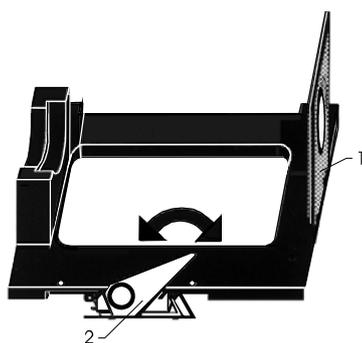
If you have finished the measurements on the SPECORD[®] S600, and you want to analyze the results on the PC, you may also switch off the SPECORD[®] S600 without shutting down the computer before.

7 Accessories

7.1 Standard cell holders

The standard scope of supply of the SPECORD® includes a universal holder and a cell holder for cells of up to 50 mm pathlength.

7.1.1 Universal holder



- 1 Mount for cell holders or solid sample holders
- 2 Clamping lever

Fig. 7 Universal holder

Inserting the universal holder in the sample compartment

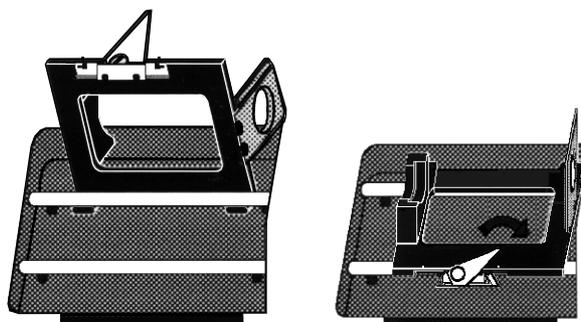


Fig. 8 Installing and clamping the universal holder

1. Put the universal holder with its hook onto the rear carrier rail and push it close to the right sample compartment wall.
2. Throw the clamping lever to the right.



Note

The carrier rails must be fixed in the upper position.

Accessories

Standard cell holders

Placing the universal holder close to the right-hand sample compartment wall is necessary, if the sample to be analyzed shall be positioned at the place of the smallest cross-section of the beam. This setup provides an optimized signal-to-noise ratio.

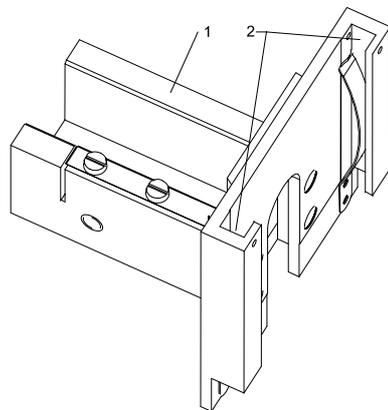
7.1.2 Cell holder

The cell holder is suitable for holding standard cells of an external width of 12.5 mm and a pathlength of between 1 and 50 mm.



Note

The minimum filling height for standard cells is 20 mm.



- 1 Cell support
- 2 Guide

Fig. 9 Cell holder

The cell holder is to be mounted to the universal holder.

1. Push the guide of the cell holder onto the corresponding mount of the universal holder.



Fig. 10 Universal holder with cell holder

2. Insert the cell so it rests against the right-hand support surface of the cell holder.

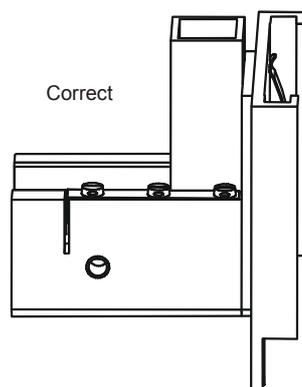


Fig. 11 Correct position of the cell in the cell holder

7.2 Further accessories

Optionally the following accessories are available for the SPECORD®:

- Thermostatted cell holder, water cooled
- Adjustable cell holder for micro, submicro or HPLC cells
- Peltier-controlled cell holder
- 6-cell changer, water-cooled
- 6-cell changer, Peltier-controlled
- 8-cell changer, water-cooled
- 8-cell changer, Peltier-controlled
- Cell carousel for 15 cells
- 100 mm cylindrical cell
- Holder for round cells
- Holder for solid samples
- 11° ... 60° variable angle reflectance accessory
- Absolute reflectance accessory
- Sipper system
- XYZ sampler
- Fiber coupling with measuring probes and SMA connectors
- 75 mm Integrating Sphere for transmission and reflectance measurements
- Cell chain for 50 samples

Accessories

Further accessories

8 Care, maintenance, lamp change

8.1 Care and maintenance

The SPECORD[®] is largely free of maintenance.

To ensure your laboratory certification with device validation, Analytik Jena AG offers you a service/maintenance agreement.

User care and maintenance is limited to the following operations:

- Cleaning of sample compartment and device casing
- Lamp change
- Change of line fuses

You should only use spares from Analytik Jena AG.

You can order consumables and wear parts by phone from our Service Department:

Hotline No.: + 49 3641-77-7407

In the case of malfunction of the device, please contact our Service Department. For the address, refer to the → inside cover page.

8.2 Cleaning

Wipe off spilt samples in the sample compartment or on accessory units instantly with cleaning tissue.

Wipe off contamination on the instrument with a soft, clean cloth slightly moistened with a commercially available, neutral detergent.

Setzen Sie das SPECORD[®] S600 keiner ätzenden Atmosphäre aus, es könnte korrodieren.

Cleaning in medical laboratories

Take particular care if the SPECORD[®] S600 is used for the analysis of infectious material.

In normal operation, possible contamination is limited to sample compartment and accessories. Remove any contamination immediately with appropriate agents taking care that no solvents can enter the interior of the device.

As possible disinfectant, we recommend the use of

Incidin[®] Plus Henkel - Ecolab Deutschland GmbH

If it is necessary to return the SPECORD[®] S600 used for the analysis of infectious material to Analytik Jena AG for servicing, it must be decontaminated before and the decontamination procedure documented.

8.3 Changing lamps

8.3.1 Part numbers of lamps

Order spare lamps from Analytik Jena AG specifying the following Part Numbers:

Lamp	Part No.
D ₂ E lamp (deuterium lamp)	820-60021-0
Halogen lamp	820-60013-0

8.3.2 Note on the service life of lamps

The service life of lamps is:

- Halogen lamp: > 500 h (at 5.0 V operating voltage)
- Deuterium lamp: > 1000 h

The service life of the lamps is reduced, if the SPECORD[®] is frequently switched on and off. This particularly applies to the deuterium lamp, because of the relatively high ignition voltage required.

The following rule applies as criterion for the service life of the deuterium lamp: With one daily ON/OFF switching operation, its radiation intensity is allowed to decrease to 50% after 1000 hours.

The deuterium lamp must be changed, if its heating coil has burnt out, its energy is insufficient or the operating hours counter indicates 2000 h.

8.3.3 Opening the flap of the lamp compartment

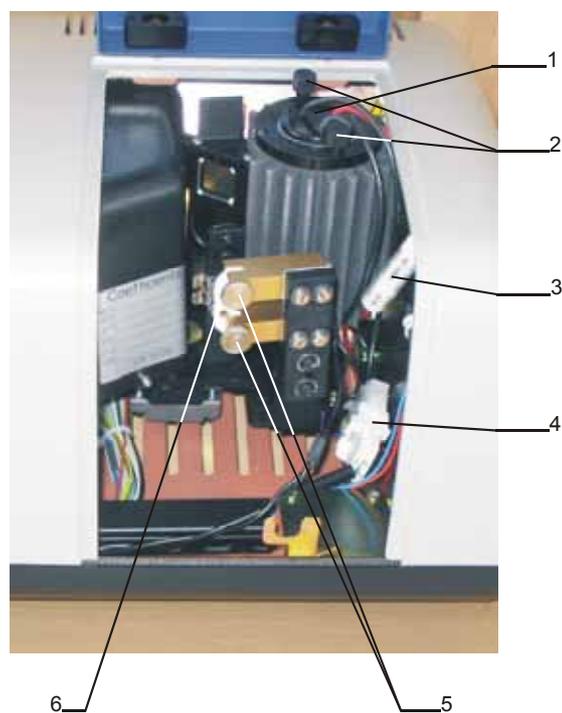
The flap of the lamp compartment is to be opened read the operating hours of deuterium lamp or change the lamps.

1. Switch the SPECORD[®] S600 off and allow the lamps to cool down sufficiently.
2. Release the lock (Fig. 12/ 2) of the flap of the lamp compartment by folding the lock frontward so it sticks out approximately vertically from the SPECORD[®] S600.
3. Swing the flap upward.



Fig. 12 Opening the flap of the lamp compartment

In the open lamp compartment, you can see the deuterium lamp and the halogen lamp.



- 1 Deuterium lamp
- 2 Knurled screws for fastening the deuterium lamp
- 3 Plug-and socket connection
- 4 Operating hour meter of deuterium lamp
- 5 Screws for fastening the halogen lamp
- 6 Halogen lamp

Fig. 13 Open lamp compartment

8.3.4 Changing the deuterium lamp



Danger! Risk of electric shock!

Before changing the deuterium lamp, make sure to switch off the SPECORD® at the power switch!



Danger! Hot lamps!

While in operation, lamps get very hot. Before changing the lamp allow it to cool down sufficiently.



Dirt on beam exit window!

Do not touch the glass bulb of the new deuterium lamp. Particularly avoid contamination on the quartz glass beam exit window! If you touched the glass bulb with your fingers, wipe off the fingerprints with a clean, lintfree cloth and pure alcohol. Any contamination will worsen the performance of the lamp.

1. Switch off the SPECORD® S600 and disconnect its power cable.
2. Open the flap of the lamp compartment and allow the lamps to cool down sufficiently.
3. Loosen the three-pole plug-and-socket connection (Fig. 13 / 3) by compressing the lateral straps and pulling the connectors apart. Unscrew the knurled screws (Fig. 13 / 2) and withdraw the defective deuterium lamp (Fig. 13 / 1) from its holder.
4. Remove the new deuterium lamp from its packaging and insert it in the lamp holder taking care that the locating pin of the lamp holder fits into groove of the lamp base.
5. Screw down the deuterium lamp by means of both knurled screws. Reconnect the lamp connector.

**Note**

Consider that the deuterium lamp needs about one hour after switch on to reach its full thermal stability!

8.3.5 Changing the halogen lamp

**Danger! Risk of electric shock!**

Before changing the halogen lamp, make sure to switch off the SPECORD® at the power switch!

**Danger! Hot lamps!**

While in operation, lamps get very hot. Before changing the lamp allow it to cool down sufficiently.

**Dirt on halogen lamp!**

Do not touch the glass bulb of the lamp to avoid any contamination affecting its performance!

1. Switch off the SPECORD® S600 and disconnect its power cable.
2. Open the flap of the lamp compartment and allow the lamps to cool down sufficiently.
3. Loosen the two fastening screws (Fig. 13 / 5).
4. Withdraw the defective halogen lamp (Fig. 13 / 6) from its holder.
5. Remove the new halogen lamp from its packaging.
6. Insert the new halogen lamp taking care to ensure that the notch at its base encloses the pin in the bottom part of the holder.
7. Fasten the halogen lamp by means of the screws (Fig. 13 / 5).

**Note**

Consider that the halogen lamp needs about one hour after switch on to reach its full thermal stability!

8.4 Changing fuses

If the line fuses are defective, you can change them yourself.



Risk of electric shock!

Before changing the fuses, make sure to switch the SPECORD® off with the power switch and disconnect the power cable from the power input connector of the device.

1. Remove the power cable from the SPECORD® S600.
2. Open the fuse holder (→ Fig. 4 p.17)) by pulling on its lid.
3. Replace the defective line fuses.
Make sure to use only the following fuse types:
 - T 2 AH.
4. Close the fuse holder again.
5. Reconnect the power cable to the power input connector of the SPECORD® S600 and the power outlet.
6. Switch the SPECORD® S600 on again.

Care, maintenance, lamp change

Changing fuses

9 Disposal

The owner/operator of the SPECORD® S600 must ensure to dispose of the waste material (samples) cropping up in the analyses in accordance with the relevant legal and local regulations.

When the service life of the device is over, dispose of the device with its electronic components as electronic scrap observing the relevant regulations.

10 List of illustrations

Fig. 1	Mechanical design of SPECORD® S600	11
Fig. 2	Optical path of SPECORD® S600	11
Fig. 3	Display elements on front panel	17
Fig. 4	Connectors on back panel.....	17
Fig. 5	WinASPECT® program icon	18
Fig. 6	Dialog box of SPECORD® S600 device driver	19
Fig. 7	Universal holder	21
Fig. 8	Installing and clamping the universal holder.....	21
Fig. 9	Cell holder	22
Fig. 10	Universal holder with cell holder.....	22
Fig. 11	Correct position of the cell in the cell holder	23
Fig. 12	Opening the flap of the lamp compartment	26
Fig. 13	Open lamp compartment.....	27