Agilent

Cary 100/300/4000/5000/6000i/7000 Spectrophotometers

User's Guide

Notices

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Safety Notices

CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

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1 Safety Practices and Hazards

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Your Agilent Cary instrument and accessories have been carefully designed so that when used properly you have an accurate, fast, flexible and safe analytical system.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Information on safety practices appears throughout the documentation (both printed and online) provided with your instrument and accessories. Before using the instrument or accessories, you must thoroughly read these safety practices.

Observe all relevant safety practices at all times.

Verifying Safe State

The following general safety precautions must be observed during all phases of operation, maintenance and service of this instrument.

To ensure continued safety of the instrument after maintenance or service procedures verify the instrument is returned to a safe state for the user. This includes running performance checks to verify the instruments safety systems are functioning correctly. Check the general condition of the instrument during operation for wear or signs of corrosion that are likely to inhibit function or safety.

Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument. Agilent Technologies assumes no liability for the customer’s failure to comply with these requirements.

Ultraviolet radiation

The deuterium (standard in all instruments) and mercury lamps (if fitted) in the instrument emit hazardous ultraviolet (UV) radiation. This radiation can cause serious damage to eyes. NEVER look directly at either lamp and NEVER operate either lamp unless it is correctly mounted in the lamp turret (Cary 4000/5000/6000i/7000 only) and the turret is correctly mounted in the instrument.

NOTE The mercury lamp is fitted as standard in the Cary 4000/5000/6000i/7000.

Electrical hazards

The Cary 100/300/4000/5000/6000i/7000 instruments and some accessories contain electrical circuits, devices, and components operating at dangerous voltages. Contact with these circuits, devices and components can cause death, serious injury, or painful electrical shock.

Panels or covers which are retained by screws on the spectrophotometer and accessories (with the exception of the lamp access cover) may be opened ONLY by Agilent-trained, Agilent-qualified, or Agilent-approved service engineers. Consult the manuals or product labels supplied with your computer, monitor and printer to determine which parts are operator-accessible.

Operators and other unauthorized personnel are permitted access ONLY to the lamp compartment and the sample compartment of the Cary. ALWAYS switch off the spectrophotometer before changing a lamp in the lamp compartment.

Application of the wrong supply voltage can create a fire hazard and a potentially serious shock hazard, and could seriously damage the Cary system, accessories and any attached ancillary equipment. The Cary 4000/5000/6000i/7000 has a Universal Power Supply that adapts to the supply voltage. However, care must be taken to ensure that the correct voltage is used.

Do not connect the spectrophotometer or accessories to the mains power supply until you have made sure that the slide switch(es) (Cary 100/300 only) at the rear of these are correctly set for the mains power supply in the specific outlet in your laboratory to which the equipment will be connected. Consult the manuals supplied with your computer, monitor and printer for their specific voltage requirements.

Replace blown fuses with fuses of the size and rating as stipulated in the text adjacent to the fuse holder or in the manuals where listed.

Do NOT use power cords with faulty or frayed insulation.

When replacing the mains power cord, only use a mains power cord with a rating equivalent to the one supplied with the instrument. See the Site Preparation Guide for the instrument for detailed mains power cord rating information.

Do not position the equipment so that it is difficult to operate the disconnecting device.

Other precautions

Both the deuterium and the visible lamps operate at high temperatures, and touching either of these lamps may result in burns. Before replacing a lamp that has been lit, switch off the spectrophotometer and either ensure that the lamp has cooled, or protect your fingers from burns.

Do not block the ventilation grilles on the spectrophotometer and accessories. Consult the manuals supplied with your computer, monitor and printer for their specific ventilation requirements.

Use of the Cary system and accessories may involve materials, solvents and solutions which are flammable, corrosive, toxic or otherwise hazardous.

Careless, improper, or unskilled use of such materials, solvents and solutions can create explosion hazards, fire hazards, toxicity and other hazards which can result in death, serious personal injury, and damage to equipment and property.

ALWAYS ensure that laboratory safety practices governing the use, handling and disposal of such materials are strictly observed. These safety practices should include the wearing of appropriate safety clothing and safety glasses.

Information symbols

The following triangular symbols appear in conjunction with warnings on the spectrometer and associated documentation. The hazard they depict is shown below each symbol:

Broken glass

Corrosive liquid

Ejecting parts

Electrical shock

Eye hazard

Fire hazard

Heavy weight
(danger to feet)

Heavy weight
(danger to hands)

Hot surface

Moving parts

Noxious gas

The following symbol may be used on warning labels attached to the instrument. When you see this symbol, refer to the relevant operation or service manual for the correct procedure referred to by that warning label.

The following symbols also appear on the instrument or in the documentation:

I	Mains power on
O	Mains power off
	Fuse
	Single phase alternating current
	Focus
	Vertical adjustment
	Horizontal adjustment
	Caution, disconnect all supplies, risk of electric shock
	High leakage current – ensure proper grounding

Color coding

The various indicator lights appearing on Agilent instruments and associated accessories are color-coded to represent the status of the instrument or accessory.

- A green light indicates the instrument is in normal/standby condition.
- An orange light indicates that a potential hazard is present.
- A blue light indicates that operator intervention is required.
- A red light warns of danger or an emergency.

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Installation requirements

Before receiving your Agilent Cary instrument, you will have been provided with a Cary Site Preparation Guide, which describes the environmental and operating requirements of the Cary system. You must prepare your laboratory according to these instructions before the Cary can be installed. You should keep the site preparation guide for future reference. If you misplace your copy, you can obtain a replacement from your local Agilent office.

Documentation

You have been provided with the following documentation to help you set up and operate your Cary 100/300/4000/5000/6000i/7000 system:

- This user's guide, with safety practices and hazards information, instructions for installing and maintaining the components of the Cary hardware and software, and troubleshooting information
- Extensive Help (provided with the Cary WinUV software) containing context-sensitive Help, step-by-step instructions for frequently performed analyses, and operating instructions.

Conventions

The following conventions have been used in procedures throughout the documentation:

- Menus, menu items, buttons and check boxes have been typed in bold. For example, 'click **OK**' and 'From the Edit menu, choose **Copy**'.

- ALL CAPITALS indicate keyboard commands. For example, 'press ENTER' and 'press SHIFT+F8'.
- A Note is used to give advice or information.
- A Tip is used to give practical hints to help you achieve the best possible performance from your instrument.

Specifications

See the Cary 100/300/4000/5000/6000i/7000 Site Prep Guide for all specifications.

Electrical Connections

Rear

IEEE 488 (GPIB Cary 100/300/4000/5000/6000i/7000 system connection)

Sample compartment

15-pin D-range connector with 2 high voltage pins: -1000 VDC, +125 VDC (Cary 4000/5000/7000), +85 VDC (Cary 6000i), -1150 VDC, 125 VDC (Cary 100/300)

When the Accessory Controller Board is fitted in the Cary 100/300 and for all Cary 4000/5000/6000i/7000 instruments:

- Three connectors for accessories in the sample compartment (low voltage DC, and digital lines)
- One connector for accessories on the front of the instrument (identical to one of the connectors described above).

NOTE There is no separate Accessory Controller Board for the Cary 4000/5000/6000i/7000. This functionality is part of the standard instrument.

NOTE For more information, refer to the Accessory Controller Board operation manual, in the Help.

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Your Cary will be installed by an Agilent-trained and certified representative. The 'Preparation' and 'Software installation on a new computer' sections and the 'GPIB communications' section are provided for your information in case you move the instrument, or are using a new computer.

Starting the software

To start the Cary WinUV software:

1. Double-click the Cary WinUV folder on the desktop.
2. Select the desired application. Refer to the Cary WinUV Help for information about the available applications.
3. The first time the Cary WinUV software is open a Software Registration dialog will appear. Click Next.

NOTE Ensure the software registration is completed by the user of the Agilent Cary UV-Vis-NIR spectrophotometer. For further information, refer to the Software Registration Help.

4 Complete all the fields on the 'Customer Details' page. Click Next.

NOTE The Product Key is found on the cover of the Agilent Cary WinUV software CD case.

5 Complete all the fields on the 'Product Details' page. Click Next.

6 Complete all the fields on the 'Work Environment Details' page. Click Register.

7 A dialog appears stating 'Your Agilent Software Registration has been successful'.

NOTE If your computer is not connected to the internet, refer to the Software Registration Help for further information.

8 The application will now open, and you can collect your data.

NOTE To familiarize yourself with the Cary WinUV software, browse the Help after installing the software.

Software Status Bulletin

Before proceeding further, you must read the Software Status Bulletin document supplied with the software and the Agilent Cary WinUV Release Notes.pdf located in the install directory. These documents contain the latest release information and important notes.

GPIB communications

A USB-GPIB-HS converter must be installed in your computer to interface the computer and Cary spectrophotometer.

USB-GPIB-HS converter

To install a National Instruments USB-GPIB-HS converter:

NOTE Ensure that the Cary WinUV software has been installed. Refer to Page 13.

1. Turn off the computer.
2. Connect one end of the converter to the instrument and the other end to the USB connection on the back of the computer.
3. Turn on the computer.

Locate the PC keyboard and mouse for ergonomically correct access.

Setting up the instrument

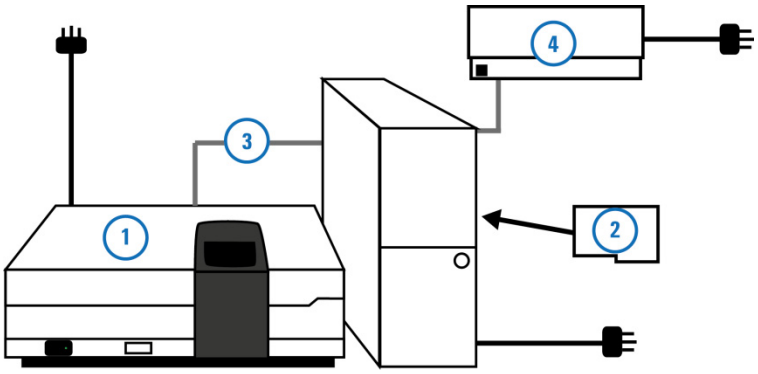

Figure 1. Cary system connection diagram.
1) Instrument 2) IEEE card
3) IEEE-488 cable 4) Printer

Allow at least 50 mm (2 in.) of space on the sides, and 150 mm (6 in.) at the rear of the system to permit free air circulation.

Cabling

The printer (4) and spectrophotometer (1) are connected to the computer via cables that plug into the back of the computer. Consult your monitor and printer manuals for details of their cabling requirements.

The spectrophotometer is connected to the computer by a shielded IEEE-488 cable (3). One end of this plugs into the interfacing board (2) in the computer and the other plugs into the socket at the rear of the spectrometer.

Power

Requirements

Power requirements are detailed in your Cary Site Preparation Guide, and in the 'Specifications' section on Page 12. Thoroughly read this information before connecting the Cary system to the power supply.

Consult the manuals supplied with your printer and computer for their power requirements.

Connection

The mains power connection is located at the rear of the instrument. Before connecting the instrument to the power supply, ensure both the instrument and the power supply are turned OFF, and that the voltage selector switches on the instrument rear panel (Cary 100/300 only) are set to the correct mains power supply voltage (refer to the table on the rear panel of the instrument).

You should also check the fuses before connecting the instrument to the mains power supply to make sure they are the correct type and rating for your location. There are two operator accessible fuses located at the rear of the instrument. See Page 33 for instructions on how to check the fuses.

To connect the instrument to the mains power supply, plug the mains power cord into the back of the instrument and the free end of the power cord into the mains power supply, and then switch on the mains power supply.

Turning on the system

Before turning on the instrument, ensure that:

- You have connected the components of the system to one another, checked the setting of the voltage taps and connected the equipment to the power supply as described on Page 16.
- The sample compartment is empty.
- The sample compartment lid is closed.

CAUTION **If you have a Cary 300 instrument, you MUST loosen the transit screw in the wavelength drive before turning on the instrument. Turning on the instrument without releasing this screw will damage the instrument. Use a flat-head screwdriver to loosen the transit screw approximately three turns. (The transit screw is located at the rear of the instrument, on the right side when viewed from the rear, and is clearly labeled).**

Switch on the spectrophotometer by depressing the side of the rocker switch marked 'I' on the front left side of the instrument.

NOTE For optimum performance, allow your Cary instrument to warm up for 2 hours before use.

Instrument performance tests

The Cary WinUV software has a Validate application that you can use to carry out a number of performance tests which check for conformance to specification for a major subset of instrument parameters. Many applications are equipped with validation files that enable you to check that your software has been correctly installed. Refer to the Help for more information on validating your software.

If any of the tests fail to meet the specifications, you will need to arrange for an Agilent representative to diagnose and correct the problem.

Sample holders

This section describes how to install the sample holders in your instrument. Unless otherwise stated, removal procedures are the reverse.

Before the solid sample or single sample holders can be installed into the Cary 4000/5000/6000i/7000 instrument, they must be mounted onto the base plate. The base plate is then installed into the instrument using the LockDown mechanism (see Page 25).

Cell holders

Cary 100/300

The Cary 100/300 comes with a cell holder base and two single cell holders. These are shipped installed in the sample compartment; however, if removed, they can be reinstalled.

To reinstall the cell holder base and cell holders:

1. Open the sample compartment lid and remove the front panel.
2. Loosen the two black screws at the back of the sample compartment and remove the black screw on the front right side. Note the position of the locating pin at the front left side of the sample compartment.
3. Hold the cell holder base so that the black, solid section is away from you. Note the key holes at the back of the cell holder base.
4. Carefully place the cell holder base in the sample compartment and slot the keyholes under the two raised black screws at the back of the compartment. The front of the cell holder base should fit over the locating pin.
5. Tighten the raised black screws and also secure the black screw at the front right side of the compartment.
6. Holding a cell holder so that the notched section is to the right (see Figure 2 below), carefully place the cell holder over the two locating pins on the cell holder base in the reference beam.

Figure 2. Top view of cell holder with notched section to the right

7. Tighten the thumbscrew.
8. Repeat Steps 6 to 7 for the sample beam.

The cell holders are now installed and ready for use.

Cary 4000/5000/6000i/7000

The Cary 4000/5000/6000i/7000 comes with two single cell holders. All instruments come with base plates as standard.

NOTE The single cell holders must be installed onto the base plate before they can be installed into the sample compartment of the instrument. For instructions on installing the base plate into the sample compartment, see Page 25.

To install the cell holder base and cell holders:

1 Open the sample compartment lid and remove the front cover.

2 Place the cell holder base in the sample position on the base plate. The notched pillar (see Figure 3 below) should be on the side to the right.

NOTE If you are operating in normal or double mode, the sample position is at the front of the sample compartment. If you are operating in reverse mode, the sample position is at the rear.

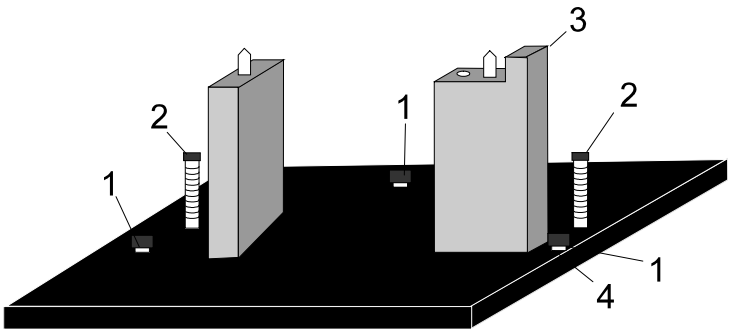

Figure 3. Cell holder base
1) Adjusting screws 2) Locating screws
3) Notched pillar 4) Locknuts

3 Tighten the two locating screws using the 1/8 inch hexagonal balldriver.

4 Place a cell holder on the cell holder base (it will only fit one way) and tighten the thumbscrew.

5 You can now install the base plate into the sample compartment of the instrument (see Page 25).

6 Once the base plate is installed, the cell holder must be aligned in the light beam (see the next section).

Aligning the single cell holder

Use this procedure for aligning the cell holders for all instruments.

To align the single cell holder:

1 Close the sample compartment lid. In the Cary Win UV software, double-click the Cary WinUV folder on the computer desktop and then double-click Align. Click the Cary tab and under 'Instrument Parameters', select Zero order. Click Apply.

2 Open the sample compartment lid and place a piece of white paper in the light path and note where the light beam strikes the cell holder. The beam should be centered on the aperture of the cell holder.

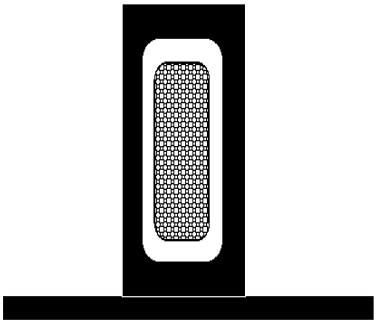

Figure 4. Single cell holder aperture. The thatched area in the middle shows the beam image

3 If the beam is not centered, use the 2.5 millimeter hexagonal balldriver to adjust the three adjusting screws in the cell holder base until the beam appears to be central to the aperture. Gently tighten the lock nuts underneath the cell holder base to fix the height of the adjusting screws.

Solid sample holder (Cary 4000/5000/6000i/7000 only)

The Cary 5000/6000i/7000 comes with two solid sample holders, which are optional for the Cary 4000. Each solid sample holder comes with four solid sample slides of various apertures: standard, 1, 5 and 10 millimeter.

To hold the solid samples, two 'V' holders are supplied (one small and one large). These are held in place on the solid sample slides by two screws. For delicate samples, a spacer is provided. This is placed between the V holder and the solid sample slide. Delicate samples are then held in place only by their edge.

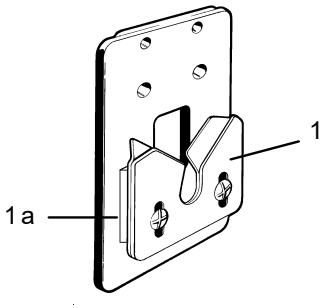

Figure 5. Solid sample slide showing V-holder (1) and spacer (1a)

Alternatively, you can attach a locking plate to a solid sample slide using the two 40 millimeter pins, as shown in Figure 6. This arrangement is suitable for large samples.

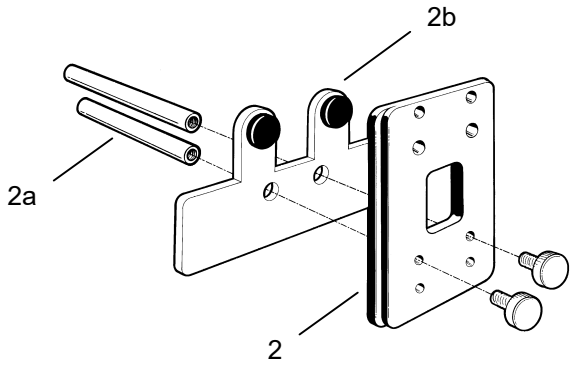

Figure 6. Solid sample slide (2) with pins (2a) and locking plate (2b)

The solid sample holder must be fitted to the LockDown base plate before being installed in the instrument.

To install the solid sample holder onto the base plate:

1 Screw the optical rails into the removable base plate using the 1/8 inch hexagonal balldriver to tighten the two locating screws. The notch should be on the right side. (Two post clips on the underside of the plate identify the back of the base plate.)

NOTE You may find it more convenient to have a set of optical rails and solid sample holders permanently installed onto a base plate. You can then simply install and remove the base plate as required.

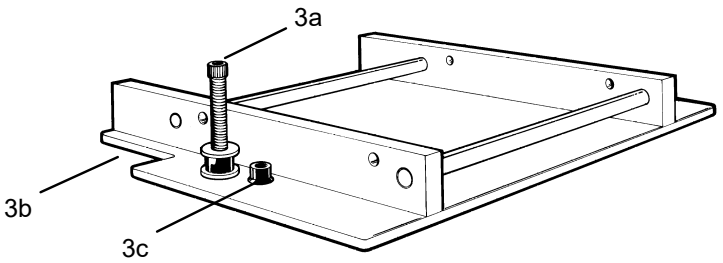

Figure 7. Optical rails showing the locating screw (3a), notch (3b) and adjustment screw (3c)

2 Place the other set of rails in the reference position with the notch towards the left side of the base plate. The setup procedure for both sample and reference solid sample holders is otherwise the same.

NOTE If you are operating in normal or double mode, the reference position is at the rear of the sample compartment. If you are operating in reverse mode, the reference position is at the front.

3 Loosely clamp the slide holder to its base. Insert the slide holder onto the optical rails but do not tighten the clamping screw.

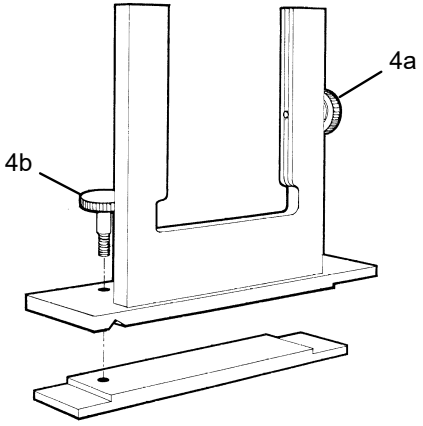

Figure 8. Slide holder showing the side screw (4a) and clamping screw (4b)

4 Insert the solid sample slide with attached V holder or locking plate into the center of the slide holder and tighten the side screw.

NOTE Place the solid sample slide into the slide holder so that the slide masks the light beam before it reaches the sample. This minimizes scattering of the light beam.

5 You must now install the base plate into the sample compartment (see Page 25) and then align the accessory (see the next section).

Aligning the solid sample holder

To align the solid cell holder:

1 Close the sample compartment lid. In the Cary Win UV software, set the wavelength to 0 nanometers (zero order). Double-click the Cary WinUV folder on the computer desktop and then double-click Align. Click the Cary tab and under 'Instrument Parameters', select Zero order. Click Apply.

2 Place a piece of white paper in the light path and note where the light beam strikes the solid sample slide. The beam should be centered on the aperture.

3 If the beam is not centered, first align it by moving the slide holder along the optical rails to the center of the sample compartment. Tighten the clamping screw on the slide holder. You will then need to use the 2.5 millimeter hexagonal balldriver to adjust the three adjusting screws on the optical rail base until the beam appears to be visually aligned.

The solid sample holder is now aligned and ready for use.

NOTE You can use a polarizer/depolarizer with the solid sample holder. These are available from Agilent.

Extra slide holders are also available. Two of these can be screwed into the ends of the optical rails.

If you want to use liquid rather than solid samples with your Cary instrument, you will first need to purchase a cell holder base and a single cell holder from Agilent.

Alternatively, you can buy a variable pathlength cell holder (see Figure 9 below) available from Agilent. This will slot into your solid sample holder base.

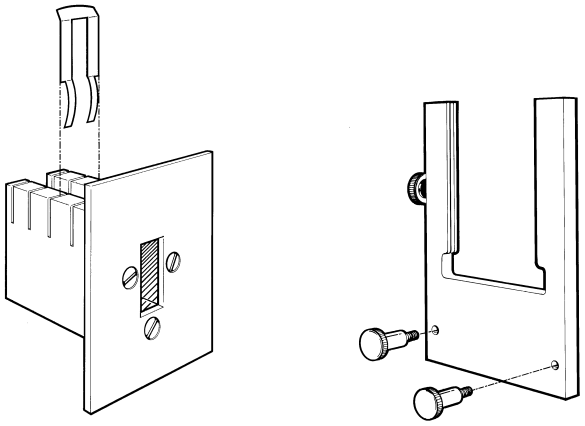

Figure 9. Optional accessories for the solid sample holder. Variable pathlength cell holder (left) and side mounted slide (right)

Position the sample so that the center of the sample sits in the center of the sample compartment (see Figure 10 below). The sample should be horizontally and vertically centered.

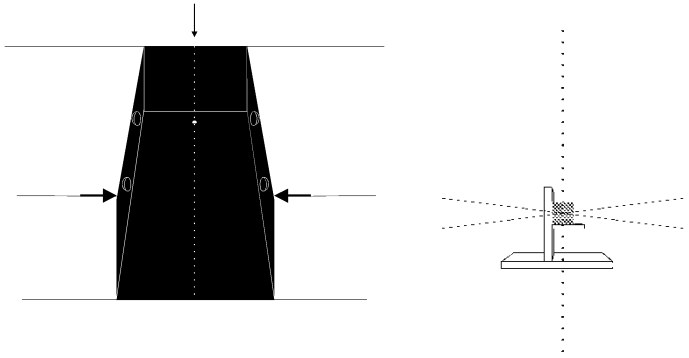

Figure 10. Aligning the sample in the sample compartment. Left: Sample compartment from above. The dotted line indicates the middle of the compartment. Right: Middle of the sample compartment when viewed from the side

Installing the base plate

The base plate needs to be locked into position in the sample compartment.

1. The LockDown mechanism features two posts at the back of the base plate and a clamp post at the front of the plate. Hold the base plate by the handle (with accessory), so that the posts are situated at the rear of the sample compartment.
2. Load the base plate into the sample compartment by pushing it backwards, allowing the two rear-mounted posts to engage under the clamps in the sample compartment floor.
3. Lower the front edge of the base plate so that the front post engages in the LockDown.
4. Move the lever at the front of the sample compartment to the left to lock the base plate into position.
5. You now need to align the accessory. See Page 23.

Installing other accessories

Your Cary instruments are compatible with a wide range of accessories. In the Help, there are descriptions of the accessories as well as instructions for installing them.

WARNING

Electrical Shock Hazard

Some accessories will plug into the electrical connectors inside the sample compartment. One of these connectors carries a high voltage for the diffuse reflectance accessory (DRA) detectors. This connector should only be used with the Agilent Internal and External DRA's.

Nitrogen purging

Cary 100/300

The sample compartment of the Cary 100/300 can be nitrogen purged if the Extended Sample Compartment is fitted. The nitrogen supply should be attached to the inlet tubes beneath the Extended Sample Compartment.

Refer to the Extended Sample Compartment operating instructions in the Help for further information.

Cary 4000/5000/6000i/7000

The nitrogen purging system is NOT supplied by Agilent, but the following items are available from appropriate commercial suppliers:

Nitrogen

Ultra-high purity liquid nitrogen, for example Nitrogen 5.0, (in conjunction with a heat exchanger) is recommended because it is less expensive than compressed nitrogen and is usually of better quality. If compressed nitrogen must be used, the gas must be dry, oil-free and uncontaminated.

CAUTION **Never use compressed nitrogen from a supplier who uses oil or water in the compression process. Such processes invariably leave fine particles of oil suspended in the nitrogen, which will form an oily deposit on optical surfaces. Use nitrogen from a supplier who fills containers from immersion pumps lubricated with liquid nitrogen.**

NOTE The instrument warranty will be void if damage is caused by the use of unsatisfactory nitrogen.

Pressure regulator and gauge

Operating pressure is from 83 to 172 kPa (12 to 25 psig). Always use an appropriate regulator and gauge to ensure that the nitrogen supply is consistently maintained at the correct pressure.

Supply tubing

Use clean, flexible plastic (polyvinyl chloride (PVC) or equivalent) tubing of 6 millimeter (1/4 inch) internal diameter. Never use rubber tubing because it may be treated internally with talc that can be blown into the optical system.

CAUTION **Never use rubber tubing, because it may be treated internally with talc that can be blown into the optical system.**

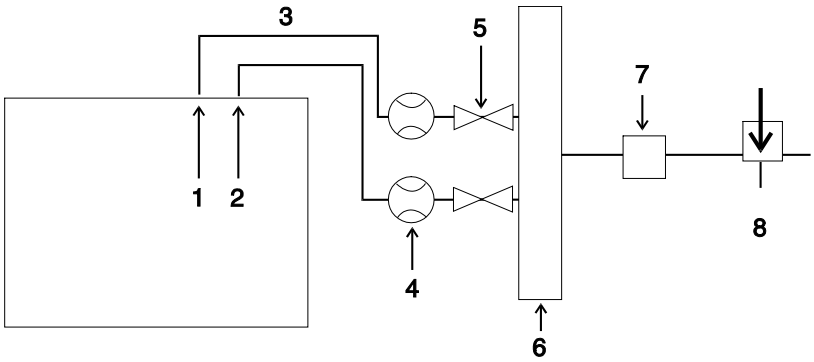

Figure 11. The position of flowmeters when purging with nitrogen

1) Instrument 2) Sample compartment 3) Tubing
4) Flowmeters 5) Shut-off valves 6) Manifold
7) Pressure regulator 8) Nitrogen control valve

Procedure

You may need to purge the instrument with nitrogen under the following circumstances:

- When taking measurements at wavelengths below 200 nanometers where it is necessary to minimize the effects of oxygen absorption bands and other absorbing species in the atmosphere such as organic solvents (for example, acetone and isopropanol).
- When taking measurements through water-absorption bands in the near-infrared region near 1370 and 1850 nanometers (Cary 5000/6000i/7000), and 2580 and 2750 nanometers (Cary 5000/7000).
- When operational conditions are such that environmental vapors or solid particles could cause damage to optical surfaces.
- When working continuously in the ultraviolet region for long periods. Purging will protect the optics.

To purge the instrument:

1. Ensure that the nitrogen purging system is installed according to the requirements in the Site Preparation Guide.
2. Open the nitrogen control valve and then adjust the regulator to provide a supply pressure between 83 and 172 kPa (12 and 25 psig).
3. Set the flowmeter valves to give the following flow rates:
   - Instrument: 0–20 L/min
   - Sample compartment: 0–10 L/min

NOTE If samples are frequently changed, you may need to increase the flow rate through the sample compartment.

NOTE You can gauge the success of purging by scanning for oxygen in the UV-Vis region and by scanning for water vapor in the NIR region (Cary 5000/6000i/7000 only).

Removing the sample compartment base

Cary 100/300

The Cary 100/300 has a rectangular base plate in the sample compartment to protect the connectors from spills. You will need to remove this plate when you install an accessory that plugs into one of the sockets underneath the sample compartment.

The plate should be replaced in the sample compartment when the accessory is removed to prevent damage to the connectors from liquid spillage.

Cary 4000/5000/6000i/7000

The base of the Cary 4000/5000/6000i/7000 sample compartment is completely removable. This allows for large apparatus to be positioned in the sample compartment.

NOTE Once the floor of the sample compartment has been removed, the optical alignment with respect to the floor has been lost. Before performing any microcell analyses, you will need to realign the optics.

To remove the base:

1. Remove the front door.
2. Remove the cover plate between the floor and the horizontal extrusion.
3. Remove the horizontal extrusion by unscrewing the 2 screws in its base.
4. Remove the lower cover plate.
5. Undo the fasteners holding the sample compartment floor.
6. Remove the sample compartment floor — the LockDown mechanism will also be removed.

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4 Maintenance

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Source lamps 32
Fuses 32
Spare Parts 33

This chapter includes some of the maintenance procedures for the Agilent Cary instrument that may be carried out by an operator. Others are included in the Help. Any maintenance procedures not specifically mentioned in this chapter or in the Help should be carried out only by Agilent-trained, Agilent-qualified or Agilent-authorized service engineers.

WARNING

Electrical Shock Hazard
This instrument contains electrical circuits, devices, and components operating at dangerous voltages. Contact with these circuits, devices and components can cause death, serious injury, or painful electrical shock. Operators and other unauthorized personnel must NEVER remove the main cover. Only Agilent-trained, Agilent-qualified, or Agilent-approved service engineers may open the main cover of the instrument.

NOTE

This section refers only to maintenance procedures for the Cary spectrophotometer. You should refer to your computer and printer manuals for their maintenance procedures.

Cleaning

Any spills in the sample compartment should be immediately wiped up and any deposits on the sample compartment windows should also be removed.

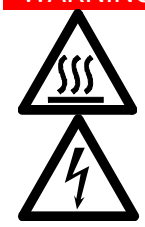
The exterior surfaces of the Cary spectrophotometer should be kept clean. All cleaning should be done with a soft cloth. If necessary, this cloth can be dampened with water or a mild detergent. Do not use organic solvents or abrasive cleaning agents.

Source lamps

Instructions for how to change and align both the visible and ultraviolet (UV) lamps for Cary instruments are included in the Help provided with the software.

For both lamps the following safety precautions should be observed:

WARNING



Hot Surface and Electrical Shock Hazards
Lamp surfaces and mounting brackets will become hot during operation and will remain hot for some time after being switched off. The temperatures are sufficient to cause burns.
The UV and mercury lamps operate at high voltage. Contact with this voltage can cause death, serious injury, or painful electric shock. Before changing the deuterium or visible lamps, ALWAYS switch off the instrument, remove the power supply cable and allow the lamps to cool.

CAUTION

Care must also be taken when removing lamps. Touching the glass envelope of either the deuterium or visible lamp will reduce its efficiency. NEVER touch the glass surfaces of new lamps. ALWAYS handle a lamp by its base, using a soft cloth.

Fuses

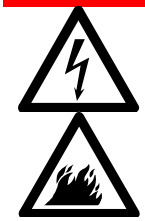
The spectrophotometer contains two fuses, which are located at the back of the instrument. To replace a fuse, disconnect the spectrophotometer from the power supply, and replace the blown fuse with one of the type and rating as indicated in the Site Preparation Guide or on the rear of the instrument.

NOTE

For safety reasons, any other internal fuse or circuit breaker is not operator-accessible, and should be replaced only by Agilent authorized personnel.

Fuse information on the rear of the instrument is the most up-to-date.

WARNING



Electrical Shock and Fire Hazards
To prevent reduced safety protection or unwanted fusing, ALWAYS ensure that the code on the fuse cap matches the information printed next to the fuse holders.

To check a fuse:

1. Disconnect the instrument from the mains power supply.
2. Undo the fuse cap by pressing the cap and turning it counter-clockwise.
3. Carefully pull out the cap. The fuse should be held in the fuse cap.
4. Check that the fuse is the correct type and is not damaged. If necessary, replace the fuse.
5. Place the fuse into the cap, push the cap in, and then turn the cap clockwise.
6. Reconnect the instrument to the mains power supply.

NOTE If a fuse repeatedly blows, it may indicate other problems with the Cary instrument. A service call may be required.

* Refer to the information printed on the back of the instrument to determine which fuse types you need.

Spare Parts

For information about spare parts and their part numbers, refer to the Agilent website: www.agilent.com

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In This Book

The manual describes the following

- Safety Practices and Hazards
- Introduction
- Installation
- Maintenance

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