

## 6 x 6 Peltier-Thermostatted Multicell Holder Series II Accessory

Overvoltage Category II

Pollution Degree 2

Equipment Class III

### Safety information

Before using this accessory, you must read the Safety Practices and Hazards section in your Cary user's guide.

A link to the Safety section can also be found on the main page of the Cary WinUV Help.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired and your safety may be at risk.

### Introduction

The 6 x 6 Multicell Holder Peltier Series II accessory is designed to be used only with the Cary 100/300 UV-Vis Series II spectrophotometers.

#### NOTE

If you do not have a Series II Cary 100 or 300, you will need to have a Series II base fitted inside your instrument for use with the Multicell Holder accessory.

The Multicell Holder consists of two sets of six staggered cell holders. This allows up to six sample cells and six reference cells to be measured in Double-Beam mode, or 12 sample cells in Single-Beam mode.

The Multicell Holder uses rotating magnetic fields to provide magnetic stirring in each of the twelve cells.

The Multicell Holder has eight Peltier heat pumps, four on each side of the cell positions. When connected to the Temperature Controller, these heat pumps are used to either transfer heat from the cell to the circulating water or transfer heat from the water to the cell. The temperature may be set from  $-10\text{ }^{\circ}\text{C}$  (approximately) to  $100\text{ }^{\circ}\text{C}$ . Alternatively, a circulating water bath may be used to maintain the temperature of the holder. The accessory has a built-in temperature probe inside the holder, however you may also mount an optional Temperature Probe accessory on top of the Multicell Holder. The two probes from this can then be inserted into selected cuvettes to allow direct monitoring of the temperature inside the cuvette. When not in use, these probes can be 'parked' in the channels alongside the front cells.



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The Multicell Holder features a mechanism for raising or lowering all of the cells at once.

Self-masking microcells may also be used with the Multicell Holder. This includes the 80  $\mu$ L microcell.

For multicell functionality, the Accessory Controller Board and appropriate Extended Sample Compartment are also required.

### Unpacking notes

Your accessory is packed in foam-lined cardboard boxes. Check that you have received all of the items in the accessory kit by referring to the packing list included with the shipment.

Inspect all parts for damage during transit. Report any damage immediately. Refer to the accessory by model and part number.

### Installation

#### General requirement:

An installed Accessory Controller board.

#### NOTE

Calibration of the cell holder must be performed before it can be used for measurements. Use the Align application.

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#### You will need:

- 1 Philips screwdriver
- 1 flat-blade screwdriver
- The Extended Sample Compartment.

#### To install the Peltier-Thermostatted Multicell Holder accessory:

- 1 Turn off the spectrophotometer. You may leave the computer turned on.
- 2 Ensure the sample compartment is empty.
- 3 Gently lift the Multicell Holder onto the edge of the instrument, with the accessory resting on the lip of the sample compartment (see Figure 1).



**Figure 1.** Resting the Multicell Holder accessory on the edge of the instrument

- 4 While the accessory is resting in this position, connect the two plugs attached to the accessory to the sockets positioned in the base of the instrument (see Figure 2).



**Figure 2.** Connecting the two plugs on the accessory to the two sockets located in the base of the instrument

- 5 Place the accessory into the sample compartment. Guide pins on the base of the accessory will sit in locating holes on the base of the instrument, correctly positioning the accessory.
- 6 Using a Philips screwdriver, tighten the front holding screw located on the right side of the accessory (see Figure 3).



**Figure 3.** Tightening the front holding screw

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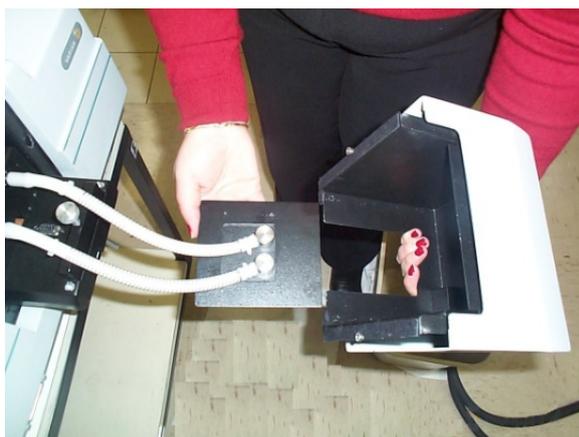
- 7 Place a hand on the front of the accessory and gently slide the top half of the accessory forward to expose the two rear holding screws (see Figure 4).



**Figure 4.** Sliding the top half of the accessory forward

- 8 Using the Philips screwdriver, tighten the two holding screws located at the rear of the accessory.
- 9 Once the two rear holding screws have been tightened, slide the top half of the accessory back into position, towards the rear of the instrument sample compartment.

Remove the baseplate from the Extended Sample Compartment. Slot the baseplate attached to the Multicell Holder into the Extended Sample Compartment. Ensure that the switch and knob on the baseplate are facing towards the instrument (see Figure 5).



**Figure 5.** Slotting the accessory baseplate into the Extended Sample Compartment

- 10 Attach the Extended Sample Compartment to the instrument by slotting the pins into the keyholes beside the sample compartment (see Figure 6).



**Figure 6.** Attaching the Extended Sample Compartment to the instrument

- 11 If you are using the Temperature Controller, attach the water hoses of the Multicell Holder to the inlet and outlet connections of the Temperature Controller. It doesn't matter which hose connects to which connection.
- 12 Connect the communications plug to the front of the Temperature Controller.

#### NOTE

You may need to rotate the communications plug before it will slot into the communications socket, as it has been designed to be inserted into only one position.

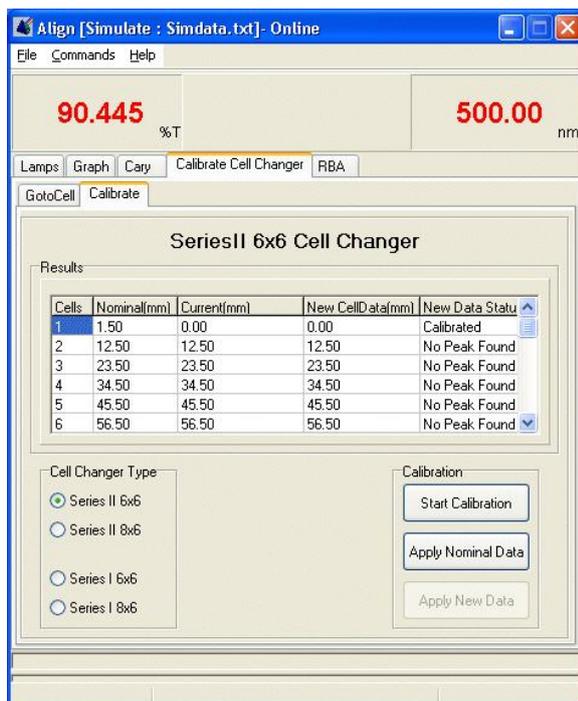
- 13 If you are using a water bath, connect the hoses to the bath inlet and outlet. Ensure that the communications plug is kept dry.
- 14 Close the sample compartment lid, turn the instrument on and wait for the initialization to finish. During the initialization, the accessory will be set to the zero position.

The accessory must now be configured before use.

## Configuring the accessory using the software

### To configure the accessory:

- 1 Open the **Align** application.
- 2 Click the **Calibrate Cell Changer** tab, then the **Calibrate** tab.
- 3 Select your cell changer type (in this case, **Series II 6 x 6**). Insert cuvettes into cell positions.
- 4 Click **Start Calibration**. The instrument will automatically go to Dual Single-Beam mode, step through the first six positions to establish the peak center of each position, and will apply the factors to the back positions. This alignment can be undertaken with or without microcells in the cell chambers; peak results will be identical.
- 5 Once the cells have been calibrated, click **Apply New Data** and the peak positions will be transferred to all applications that use the Series II 6 x 6. If another cell changer is used, it will need to be calibrated so the correct factors are used in the software.



**Figure 7.** The Align application Calibrate Cell Changer page. Note that this picture shows the software in 'simulation' mode.

The accessory is now ready to be operated. For more details, see the next section.

**NOTE**

It is recommended that all cell holder positions are calibrated for a micro-cuvette calibration.

**NOTE**

If you wish to calibrate all the cell positions and have only a limited number of cuvettes, simply place the cuvettes into the first cell positions, moving through each cell by following the prompts. It is also recommended for a micro-cuvette calibration to use the cuvettes that will be used when measuring a sample.

Once the cell positions are calibrated, the Cary WinUV software will use these optimized positions for measurement.

**Operation**

Once installed, cells can be placed in the Multicell Holder and readings taken. To simultaneously measure a sample and its blank, place them in the corresponding positions in the front and rear cell holders.

Movement of cells into and out of the light beam is controlled by the Cell Changer options on the Accessories page of the Cary WinUV software. The cells must be perfectly square. Ideal cells are 10 mm square.

**NOTE**

Self-masking microcells are recommended for the best possible results.

**Cell lifting**

The cell lifter knob enables the cells to be lifted. To lift the cells, pull the knob upwards.

### Magnetic stirring

You can automatically stir the contents of each cell by adding a magnetic stirrer star to the cells. Star stirrers of approximately 7.5 mm in diameter are recommended. Magnetic stirring rods are not suitable for use with the Multicell Holder.

Activate the magnetic stirrer with the switch underneath the Extended Sample Compartment. Use the knob on the same panel to control the stirring speed.

### Using the Temperature Probe

Refer to the Temperature Probe accessory instructions for details on fitting and using the Temperature Probe with the Multicell Holder.

**NOTE**

You can use up to four probes by connecting another Temperature Probe accessory to the external accessory port. Use the extension lead provided to reach to the sample compartment.

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### Temperature control

Now that you have the hardware set up, you need to set up the software that controls the Temperature Controller.

To control the temperature with a water bath, set up the bath to provide a constant flow through the Multicell Holder.

If you are using a water bath or temperature controller you will need to ensure you use the correct coolant. Automotive cooling corrosion inhibitor that is suitable for use with aluminum is acceptable for this purpose.

**NOTE**

If you are using a water bath to control the temperature of the holder, the Peltiers in the Multicell Holder will not be active. Only the heat from the circulating bath will heat the cells.

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**NOTE**

If you are not using all of the cell positions in the Multicell Holder, you may wish to place a cuvette with a blank solution in one of the unused cell positions. You can then place the Temperature Probe accessory (if fitted) in this cuvette and monitor the temperature without having to worry about blocking the light beam.

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### Using microcells

If you have only a small volume of sample, you may wish to use microcells in the Multicell Holder. Self-masking microcells are recommended for the best possible results. It is not advisable to use unmasked microcells in the Multicell Holder, because the light may reflect from the inside walls of the cells, giving rise to spurious results.

**NOTE**

If you are using the Multicell Holder to perform single-cell measurements (that is, the Sample Transport will be stationary during the measurement), you can use any cell you wish as long as the 'Z' height (the distance between the bottom of the cell and the center of the cell aperture) is 20 mm. Self-masking cells are recommended.

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For low-volume work, we recommend these microcells, which are available from Agilent:

Description	Path length	Path width	Volume	Material	Quantity
Stoppered black-walled semi, 0.9 mL	10 mm	4 mm	0.9 mL	UV	2
Stoppered black-walled, 80 µL	10 mm	4 mm	80 µL	UV	1
1.5 mL with stirring	10 mm	4 mm	1.2 mL	UV	1

## Removal

**To remove the Multicell Holder accessory from the instrument:**

- 1 Turn off the instrument.
- 2 Unscrew the front locating screw and then gently slide the top of the accessory forward.
- 3 Unscrew the two rear holding screws and then reposition the top of the accessory by sliding it towards the back of the instrument sample compartment.
- 4 Position a hand at the front and the rear of the accessory and lift the accessory directly upward until the two plugs are visible.
- 5 Disconnect the two plugs from the sockets in the bottom of the sample compartment floor and then completely remove the accessory.

## Specifications

For environmental requirements, refer to your instrument user's guide. This product is suitable only for indoor use.

### Environmental

Condition	Altitude	Temperature (°C)	Humidity (%RH) non-condensing
Non-operating (transport)	0–2133 m (0–7000 ft)	5–45	20–80
Operating within performance specifications	0–853 m (0–2800 ft)	10–35	8–80
	853–2133 m (2800–7000 ft)	10–25	8–80

### Weights

- Packed: 9 kg (19.8 lb)
- Unpacked: 5 kg (11 lb)

### Dimensions

- Packed: 510 x 600 x 300 mm (20.7 x 23.6 x 11.8 in)
- Unpacked: 140 x 300 x 150 mm (5.5 x 11.8 x 5.9 in)

### Connections

#### Electrical

- Spectrophotometer via flying lead, 25-pin D-range connector
- Temperature Controller via main trunk, 14-way CPC-type connector

- Spectrophotometer via flying lead, 15-pin D-range connector

### Water

Temperature Controller via main trunk, inlet and outlet, ½-in id PVC hose with PVC 1/2 BSP screw-type fitting.

### Miscellaneous

Temperature range: -10 °C (approximately) to 100 °C

#### NOTE

Lower limit will depend on the ambient air temperature in the room and relative humidity. Specification is based on ambient air temperature of 25 ±5 °C.

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Temperature accuracy: ± 0.3 °C, 100 to 0 °C

Temperature ramp-down rate from 100 to 0 °C: <10 minutes

The temperature of the cell holder is set to 100 °C and allowed to stabilize for 5 minutes. Then the temperature is set to 0 °C. The time taken to reach 0 °C must be less than 10 minutes.

Temperature ramp-up rate from 0 to 100 °C: <5 minutes

The temperature of the cell holder is set to 0 °C and allowed to stabilize for 5 minutes. Then the temperature is set to 100 °C. The time taken to reach 100 °C must be less than 5 minutes.

Temperature ramp-down rate from 20 to -4 °C: < 10 minutes

The temperature of the cell holder is set to 20 °C and allowed to stabilize for 5 minutes. Then the temperature is set to -4 °C. The time taken to reach -4 °C must be less than 10 minutes.

Static cell to mean variation: < ±0.3 °C

After 10 minutes at 37 °C, the temperature of distilled water in semi-micro cuvettes (4 mm path width) must not differ by more than 0.3 °C from the mean.

Ramping cell to mean variation: < ±0.5 °C

The temperature in the cell holder is set to 64 °C and allowed to stabilize for 5 minutes. The cell holder is then set to ramp at 0.4 °C/minute to 67 °C. The temperature of distilled water in semi-micro cuvettes (4 mm path width) must not differ by more than 1.0 °C from the mean at 65 °C.

## Maintenance and cleaning

The outside of the Multicell Holder should be kept clean by wiping with a dampened (with either water or alcohol) soft cloth. Do not use abrasive cleaning agents. If the inside of the cuvette positions require cleaning, wrap a dampened soft cloth around a metal rod or spatula and gently wipe the inside surfaces.

Ensure that the printed circuit board is kept dry and free from dust.

## Technical assistance

For technical assistance regarding this accessory, see [www.agilent.com](http://www.agilent.com).

This information is subject to change without notice.



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