

Lambda 465 DRA-100 Installation Instructions

This instruction sheet describes the installation of this accessory which is used with the Lambda 465 Spectrophotometer.

NOTE: *Read these instructions before you install this accessory.*

Contacting PerkinElmer

Supplies, replacement parts, and accessories can be ordered directly from PerkinElmer, using the part numbers.

See our website:

<http://perkinelmer.com>

PerkinElmer's catalog service offers a full selection of high-quality supplies.


To place an order for supplies and many replacement parts, request a free catalog, or ask for information:

If you are located within the U.S., call toll free 1-800-762-4000, 8 a.m. to 8 p.m. EST. Your order will be shipped promptly, usually within 24 hours.

If you are located outside of the U.S., call your local PerkinElmer sales or service office.

Safety

The following safety symbols are used on this product.

| Warning | Description |
|---|--|
|  | <p>Always refer to the system manual when working near locations at which the alert mark shown on the left is attached. If the operation, etc., is performed without heeding the advice in the System manual, there is a risk of personal injury. In addition, the equipment performance may be reduced. Moreover, this alert mark is sometimes used with other marks and descriptions indicating other dangers.</p> <p>Il faut toujours voir le manuel du système lors de l'exécution de travaux près des endroits où le panneau d'alerte montré dans la colonne à gauche est placé. Il y a un risque de blessures, si le travail est effectué sans respecter les conseils dans le manuel du système. En outre, le rendement de l'équipement pourrait être réduit. Par ailleurs, ce panneau d'alerte est parfois utilisé avec d'autres panneaux comportant les indications de danger.</p> |

**Warning**

When supplying power to this equipment, connect the accessory 3-pin power cord to a 3-pin grounded power outlet. If a grounded 3-pin outlet is not available, use a conversion adapter and ground the green wire. If power is supplied without grounding the equipment, there is a risk of receiving a fatal electric shock and equipment damage.

Lors de l'alimentation de l'équipement, branchez le cordon d'alimentation accessoire à 3 broches dans une prise d'alimentation mise à la terre à 3 broches. Si une prise mise à la terre à 3 broches n'est pas disponible, utilisez un adaptateur de conversion en raccordant le fil vert pour réaliser la mise à la terre. Si l'alimentation est fournie sans mettre l'équipement à la terre, il y a un risque d'électrocution et de dommages à l'équipement.

"On" (power)

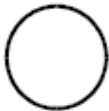


To indicate connection to the mains, at least for mains switches or their positions, and all those cases where safety is involved.

"On" (Sous tension)

Pour indiquer le branchement à l'alimentation du secteur, au moins pour les interrupteurs du secteur ou leur position, et tous les autres cas qui concernent la sécurité.

"OFF" (power)



To indicate disconnection from the mains, at least for mains switches or their positions, and all those case where safety is involved.

"OFF" (Hors tension)

Pour indiquer la coupure du secteur, au moins pour les interrupteurs du secteur ou leur position, et tous les autres cas qui concernent la sécurité.

The user cannot repair this equipment.

DO NOT attempt to open the case or to disassemble internal parts.

Only PerkinElmer service representative with knowledge of electrical fire and shock hazard should service this equipment.

There are high-voltage parts in this equipment presenting a risk of severe injury or fatal electric shock to untrained personnel.

In addition, there is a risk of damage to precision parts.

Repair



 **Warning**

L'utilisateur ne doit pas essayer de réparer cet équipement.

NE PAS tenter d'ouvrir le boîtier ou de démonter ses pièces internes.

Seul un représentant du service PerkinElmer qui est conscient des risques d'incendie et d'électrocution devrait réparer cet équipement.

Cet équipement contient des parties à haute tension présentant des risques de blessure grave ou d'électrocution au personnel non qualifié.

En outre, il existe un risque d'endommagement des pièces de précision.

Falling Over

 **Caution**

This equipment should be used in the correct position. If the equipment is turned on its side, etc., it will be unstable and may be damaged if it falls over as a result of receiving a slight mechanical shock.

Cet équipement doit être utilisé dans l'orientation correcte. Si, par exemple, l'équipement est couché sur un de ses côtés, il deviendra instable. S'il tombe à la suite d'un léger choc mécanique, il pourra être endommagé.

Changing Fuse

 **Warning**

For continued protection against risk of fire, replace only with same type and rating of fuse.

Before changing the fuses, ALWAYS remove the power cord from the power-outlet and replace the blown fuses.

250V ~ T3.15AL indicates a time-lag fuse.

Pour assurer la protection contre le risque d'incendie, le fusible ne doit être remplacé qu'avec le même type et la même valeur nominale.

Il faut TOUJOURS débrancher le cordon d'alimentation de la prise électrique avant de remplacer les fusibles grillés.

250V ~ T3.15AL indique un fusible à action retardée.

Keep the equipment free of dust.

Clean the power line regularly; if dust accumulates around the power pins, there is a risk of fire.

Keep the equipment clean so that the ventilation holds are not obstructed. If the ventilation is obstructed, the system may overheat and catch fire. Periodically clean your equipment's case using a damp cloth.

Cleaning



Caution

Do not use abrasives, cleaning solvents or strong detergents, as they may damage the finish or affect the reliability of the structural components.

Gardez l'équipement exempt de poussières.

Nettoyez le cordon d'alimentation régulièrement. Les poussières qui s'accumulent autour des broches du cordon d'alimentation pourraient entraîner un risque d'incendie.

Gardez l'équipement propre de sorte que les orifices de ventilation ne soient pas bouchés. Si les grilles de ventilation sont obstruées, le système pourrait surchauffer et s'enflammer.

Nettoyez périodiquement le boîtier de l'équipement à l'aide d'un chiffon humide.

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

Si l'équipement est utilisé d'une manière non spécifiée dans ce manuel, la protection fournie par l'équipement risque d'être altérée.

| | |
|------------------|---|
| CAUTION | <p>We use the term CAUTION to inform you about situations that could result in serious damage to the instrument or other equipment. Details about these circumstances are in a box like this one.</p> |
| <p>D</p> | <p>Caution (Achtung) <i>Bedeutet, daß die genannte Anleitung genau befolgt werden muß, um einen Geräteschaden zu vermeiden.</i></p> |
| <p>DK</p> | <p>Caution (Bemærk) <i>Dette betyder, at den nævnte vejledning skal overholdes nøje for at undgå en beskadigelse af apparatet.</i></p> |
| <p>E</p> | <p>Caution (Advertencia) <i>Utilizamos el término CAUTION (ADVERTENCIA) para advertir sobre situaciones que pueden provocar averías graves en este equipo o en otros. En recuadros éste se proporciona información sobre este tipo de circunstancias.</i></p> |
| <p>F</p> | <p>Caution (Attention) <i>Nous utilisons le terme CAUTION (ATTENTION) pour signaler les situations susceptibles de provoquer de graves détériorations de l'instrument ou d'autre matériel. Les détails sur ces circonstances figurent dans un encadré semblable à celui-ci.</i></p> |
| <p>I</p> | <p>Caution (Attenzione) <i>Con il termine CAUTION (ATTENZIONE) vengono segnalate situazioni che potrebbero arrecare gravi danni allo strumento o ad altra apparecchiatura. Troverete informazioni su tali circostanze in un riquadro come questo.</i></p> |
| <p>NL</p> | <p>Caution (Opgelet) <i>Betekent dat de genoemde handleiding nauwkeurig moet worden opgevolgd, om beschadiging van het instrument te voorkomen.</i></p> |
| <p>P</p> | <p>Caution (Atenção) <i>Significa que a instrução referida tem de ser respeitada para evitar a danificação do aparelho.</i></p> |

**WARNING**

We use the term **WARNING** to inform you about situations that could result in **personal injury** to yourself or other persons. Details about these circumstances are in a box like this one.

D**Warning (Warnung)**

Bedeutet, daß es bei Nichtbeachten der genannten Anweisung zu einer **Verletzung** des Benutzers kommen kann.

DK**Warning (Advarsel)**

Betyder, at brugeren kan blive **kvæstet**, hvis anvisningen ikke overholdes.

E**Warning (Peligro)**

Utilizamos el término **WARNING (PELIGRO)** para informarle sobre situaciones que pueden provocar **daños personales** a usted o a otras personas. En los recuadros como éste se proporciona información sobre este tipo de circunstancias.

F**Warning (Danger)**

Nous utilisons la formule **WARNING (DANGER)** pour avertir des situations pouvant occasionner des **dommages corporels** à l'utilisateur ou à d'autres personnes. Les détails sur ces circonstances sont données dans un encadré semblable à celui-ci.

I**Warning (Pericolo)**

Con il termine **WARNING (PERICOLO)** vengono segnalate situazioni che potrebbero provocare **incidenti alle persone**. Troverete informazioni su tali circostanze in un riquadro come questo.

NL**Warning (Waarschuwing)**

Betekent dat, wanneer de genoemde aanwijzing niet in acht wordt genomen, dit kan leiden tot **verwondingen** van de gebruiker.

P**Warning (Aviso)**

Significa que a não observância da instrução referida poderá causar um **ferimento** ao usuário.

Electrical Safety

The instrument has been designed to protect the operator from potential electrical hazards. This section describes some recommended electrical safety practices.



WARNING

Lethal voltages are present at certain areas within the instrument. Installation and internal maintenance of the instrument should only be performed by a PerkinElmer service engineer or similarly authorized and trained person. When the instrument is connected to line power, opening the instrument covers is likely to expose live parts. Even when the power switch is off, high voltages can still be present. Capacitors inside the instrument may still be charged even if the instrument has been disconnected from all voltage sources.

Des tensions mortelles sont présentes quelque part à l'intérieur de l'instrument. L'installation et la maintenance interne de l'instrument ne doivent être effectuées que par un technicien de maintenance PerkinElmer ou une personne pareillement autorisée et formée. Lorsque l'instrument est branché au secteur, l'ouverture de ses couvercles est susceptible d'exposer des parties sous tension. Même quand l'interrupteur d'alimentation est en position Off, des tensions élevées peuvent encore être présentes. Des condensateurs à l'intérieur de l'instrument peuvent être encore chargés, même si l'instrument a été débranché de toutes les sources de tension.

The instrument must be correctly connected to a suitable electrical supply. The supply must have a correctly installed protective conductor (earth ground) and must be installed or checked by a qualified electrician before connecting the instrument.



WARNING

Any interruption of the protective conductor (earth ground) inside or outside the instrument or disconnection of the protective conductor terminal is likely to make the instrument dangerous. Intentional interruption is prohibited.

Toute interruption du conducteur de protection (mise à la terre) à l'intérieur ou à l'extérieur de l'instrument ou la déconnexion de la borne de conducteur de protection sont susceptibles de rendre l'instrument dangereux. L'interruption intentionnelle est interdite.

When working with the instrument:

- Connect the instrument to a correctly installed line power outlet that has a protective conductor connection (earth ground).
- Do **not** operate the instrument with any covers or internal parts removed.
- Do **not** attempt to make internal adjustments or replacements except as directed in the manuals.
- Disconnect the instrument from all voltage sources before opening it for any adjustment, replacement, maintenance, or repair. If afterwards, the opened instrument must be operated for further adjustment, maintenance, or repair, this must only be done by a PerkinElmer Service engineer.

- Whenever it is possible that the instrument is no longer electrically safe for use, make the instrument inoperative and secure it against any unauthorized or unintentional operation. The electrical safety of the instrument is likely to be impaired if, for example, the instrument shows visible damage; has been subjected to prolonged storage under unfavorable conditions; or has been subjected to severe stress during transportation.

EMC Compliance

EC directive

The DRA-100 has been designed and tested to meet the requirements of the EC directive 2006/95/EC. DRA-100 complies with the EMC standard EN61326, (EMC standard for electrical equipment for measurement, control and laboratory use)

FCC rules and regulations

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.


Installation Category

This product will operate safely in electrical power environments that are rated as Installation Category II in EN/IEC 61010-1.

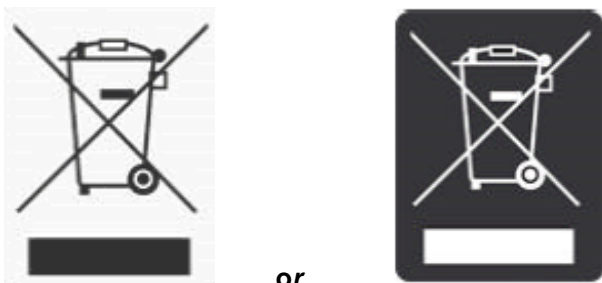
Pollution Degree

This product will operate safely in environments that contain nonconductive foreign matter up to Pollution Degree 2 in EN/IEC 61010-1.

Warning Labels

| | |
|---|--|
|  | <p><i>When this label is attached to an instrument it means refer to the manual.</i></p> |
| <p>WARNING</p> | <p><i>Lorsque cette étiquette est attachée à un instrument, il est nécessaire de voir le manuel.</i></p> |

WEEE Instructions for PerkinElmer Products



A label with a crossed-out wheeled bin symbol and a rectangular bar indicates that the product is covered by the Waste Electrical and Electronic Equipment (WEEE) Directive and is not to be disposed of as unsorted municipal waste. Any products marked with this symbol must be collected separately, according to the regulatory guidelines in your area.

The objectives of this program are to preserve, protect and improve the quality of the environment, protect human health, and utilize natural resources prudently and rationally. Specific treatment of WEEE is indispensable in order to avoid the dispersion of pollutants into the recycled material or waste stream. Such treatment is the most effective means of protecting the customer's environment.

Requirements for waste collection reuse, recycling, and recovery programs vary by regulatory authority at your location. Contact your local responsible body (e.g., your laboratory manager) or authorized representative for information regarding applicable disposal regulations. Contact PerkinElmer at the web site listed below for information specific to PerkinElmer products.

Web address:

www.perkinelmer.com/WEEE

For Customer Care telephone numbers select "Contact us" on the web page.

Products from other manufacturers may also form a part of your PerkinElmer system. These other producers are directly responsible for the collection and processing of their own waste products under the terms of the WEEE Directive. Please contact these producers directly before discarding any of their products.

Consult the PerkinElmer web site (above) for producer names and web addresses.

Fuses



WARNING

There is risk of receiving a fatal electric shock if the fuses are replaced with the power cord connected.

Il y a un risque d'électrocution si les fusibles sont remplacés tandis que le cordon d'alimentation est encore branché.

The fuse is located at the rear of the instrument.

1. Turn off and unplug the instrument.
2. Carefully open the compartment latch where the fuse is located.
3. Disconnect the fuse.
4. Replace with two T3.15AL fuses, one for each phase.
5. Close the compartment door.
6. Plug in the instrument and turn on.

Power

A grounded AC power supply must be used. The DRA-100 accepts 100 to 240 VAC at 50 Hz or 60 Hz.



WARNING

In order to protect the system from electrical noise and current surges, please connect the power cord to a GROUNDED OUTLET.

Afin de protéger le système contre les bruits électriques parasites et les surtensions de courant, veuillez brancher le câble d'alimentation à une prise d'alimentation mise à la terre.



WARNING

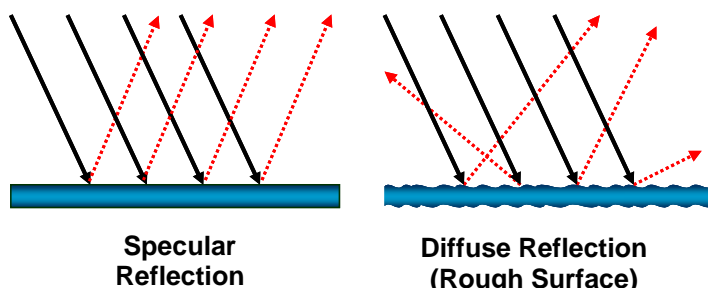
The electric power could be dangerous. Before connecting the power cord, verify that the main power switch is off.

Le courant électrique peut être dangereux. Avant de brancher le cordon d'alimentation, vérifiez que l'interrupteur du secteur soit en position Off.

Introduction

Specular Reflection and Diffuse Reflection

Light hitting a solid surface reflects in one of two ways. If the surface is smooth on a microscopic level, individual light rays will reflect at the same angle, if it is rough, the light will be scattered. Reflection from the smooth surface is called Specular Reflection, while reflection from the rough surface is called Diffuse Reflection. The sum is called the Total Reflection.



The DRA-100 is used to measure the diffuse reflectance of various samples such as Metal, Film, Glass, Cloth, Paper, Gems, Powder, etc. It can be also used for measuring the sample color using the UV Lab software's Color Analysis mode. An Integrating Sphere which has a diameter of 60 mm was built in the DRA-100.

Features

- For measuring the color
- For measuring the Diffuse reflection
- Xenon Lamp included
- Free Voltage (100V - 240V)
- Easy to install
- Use for measuring various of samples such as powder, film, solid, etc.



Figure 1 Lambda 465 DRA-100 [P/N: N4104008]

Dimensions and Specifications

Specifications of the DRA-100

| Type | Specification |
|--------------------------|-----------------------------------|
| Spectral range (nm) | 270-1000 |
| Dimensions (mm) | 456 (L) x 277 (W) x 167 (H) |
| Sphere diameter (mm) | 60 |
| Weight (kg) | 7.2 |
| Sample port aperture | 10 mm, 5 mm |
| Sphere coating | Barium Sulfate |
| Reflectivity | >98% 270-1000 nm (Max 1000 nm) |
| Reflectance measurements | SCE (Specular Component Excluded) |
| Bulb life | 1,200 hours |

Specifications of the White standard

| Type | Specification |
|------------------|---|
| Dimensions | 38-mm diameter (housing) 32-mm OD, 10 mm thick |
| Weight | 30 g |
| Spectral range | 250-2000 nm |
| Housing | Delrin holder, protective cover |
| White material | Spectralon |
| Reflectivity | 99% (400-1500 nm) >96% (250-2000 nm) |
| Max. Temperature | 350°C |



Description

Configuration of the DRA-100





Figure 2 Lambda 465 DRA-100 Accessory Configuration

White Blank & Light Trapper

| Light Trapper | White standard |
|--|--|
|  <p data-bbox="334 1402 854 1436">For measuring the Dark Current of DRA-100</p> |  <p data-bbox="894 1402 1260 1436">For measuring the White Blank</p> |

Sampling Port

| | |
|--|--|
|  <p data-bbox="358 1850 565 1883">Port size : 10 mm</p> <p data-bbox="602 1850 808 1883">Port size : 5 mm</p> | <p data-bbox="1016 1570 1162 1604">Screw bolt</p> <p data-bbox="984 1612 1195 1646">Length 6 mm. 4ea</p>  |
|--|--|

Powder sample accessory

| | |
|---|--|
| Powder Cell for DRA-100 | Powder Cell Holder for DRA-100 |
|  |  |
| Screw bolt Length 10 mm, 4 ea | |
|  | |

Environmental Requirements

This system is for indoor use only.

| Requirement | Description |
|-----------------------|--|
| Indoor use | Altitude up to 2000m (6,500 ft.) Pollution degree 2 |
| Dimensions | 456 mm(L) × 277 mm(W) × 167 mm(H) |
| Weight | 7.2 kg |
| Electrical supply | AC 100-240V, 50/60Hz, 150W |
| Operating Temperature | 15 - 35°C (59 - 95°F) |
| Operating humidity | Less than 80% relative, non-condensing |

Installation

1. Disassemble the existing cell holder.

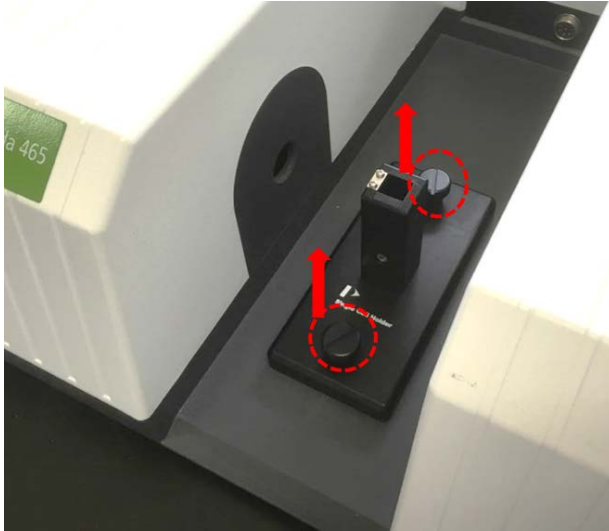


Figure 3 Location of the two knob bolts

2. Install the DRA-100 as shown below.



Figure 4 Installing the DRA-100

3. Tighten the knob bolt by turning it clockwise to secure the DRA-100 in the sample compartment.



Figure 5 Tightening the knob bolt



WARNING

The electric power could be dangerous. Before connecting the power cord, verify that the main power switch is off.

Le courant électrique peut être dangereux. Avant de brancher le cordon d'alimentation, vérifiez que l'interrupteur du secteur soit en position Off.

4. Connect the communication cable and the power cord, and then turn on the power of the Lambda 465.
5. Connect the power cord to the DRA-100. Then turn on the power switch which is located on the DRA-100.
6. Press the Lamp ON button to turn on the xenon lamp.



Figure 6 Pressing the Lamp ON button

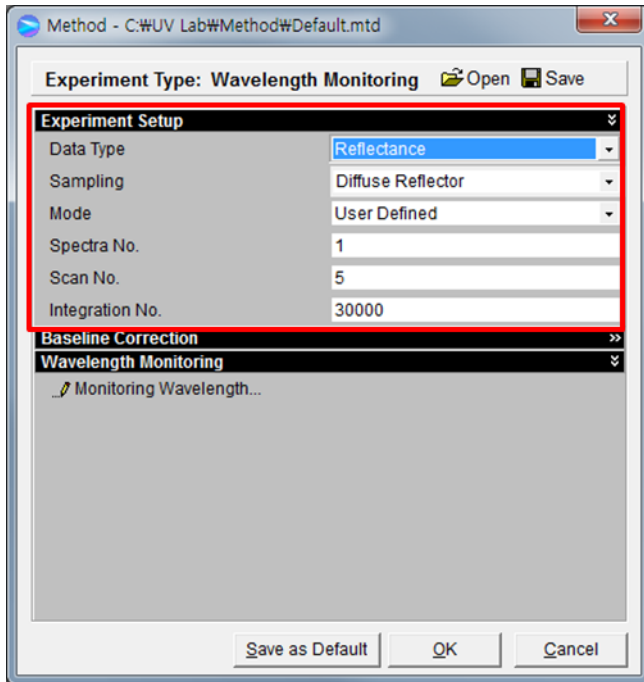
NOTE: Before turning on the xenon lamp, you should wait for 10–20 sec after turning on the power of the accessory. If not, the fuse may be burnt out.

Measurement

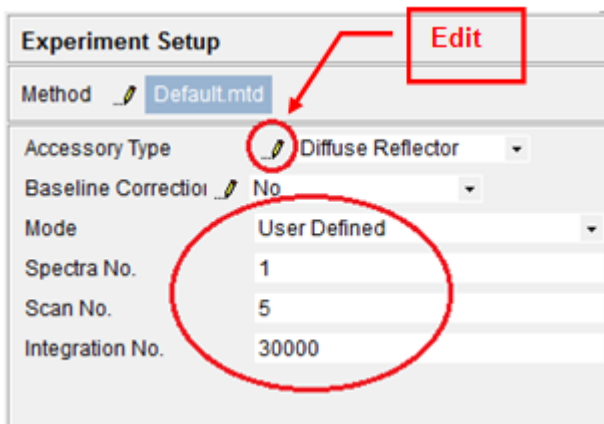
Measurement of Metal, Glass, Film, Cloth, Paper or Gems, etc.

Note: Start the sample measurement after warming up the system for at least 20 minutes.

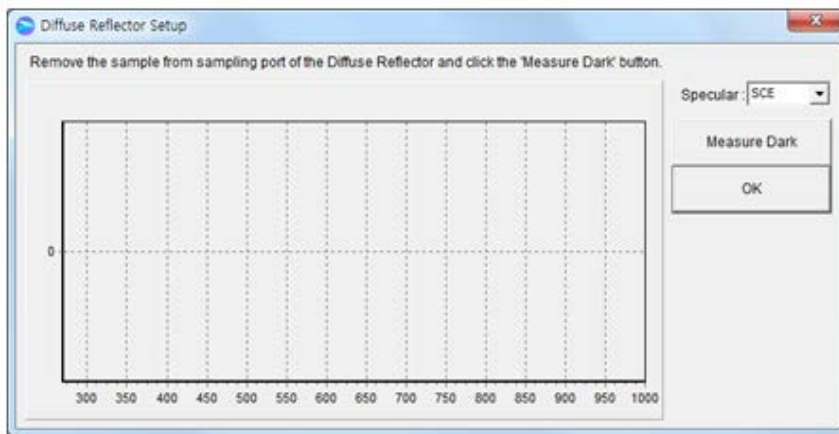
1. Launch the UV Lab software, select **Experiment Type** and click **OK**. Choose the **Reflectance** on the Data Type and **Diffuse Reflector** on the Sampling mode. Enter each parameter and click **OK**.



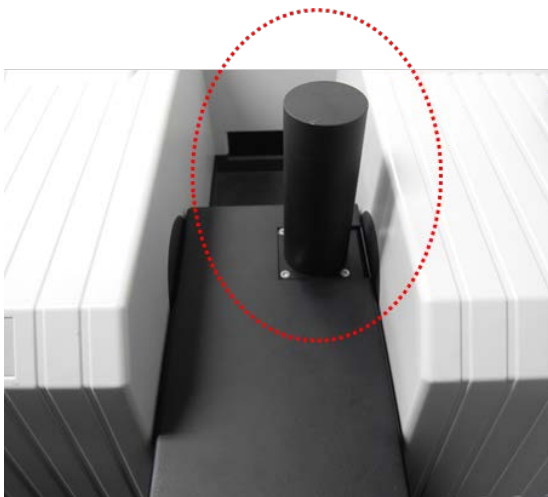
2. As **Diffuse Reflector** is chosen, make sure that the default values (Mode, Spectra No., Scan No. and Integration No.) are correct as below. Then click **Edit**.



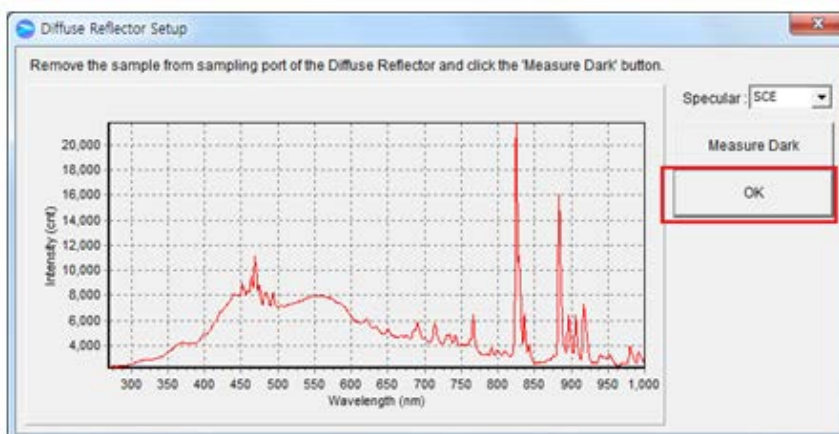
3. The following window appears.



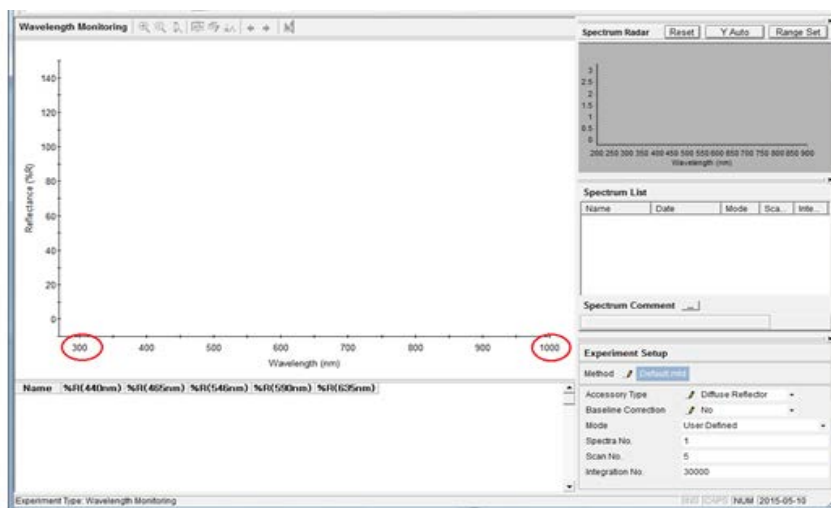
4. Put the Light Trapper in the sampling port of the DRA-100.



5. Click **Measure Dark**.
6. The following window appears. Click **OK**.



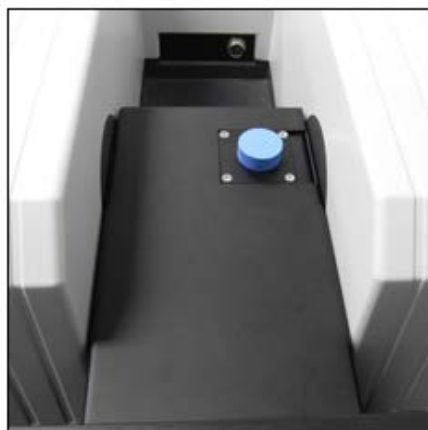
7. Check whether the range of wavelengths is set from 270 to 1000 nm.



8. Put the White standard on the sampling port as below.



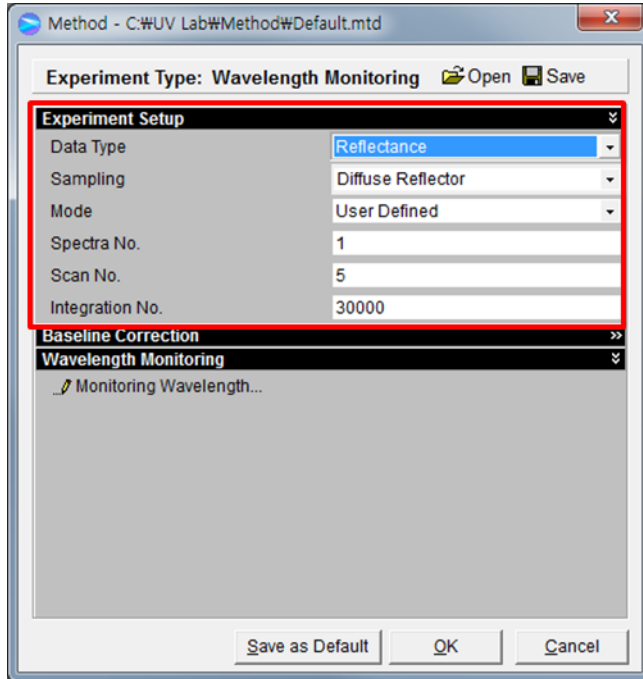
9. Click the **Blank** icon to measure blank.
10. After checking the blank spectrum has 100% reflectance value in the whole range, put the sample on the sampling port as below.
- a. Put the sample on the sampling port. b. Put the Light Trapper over the sample on the sampling port.



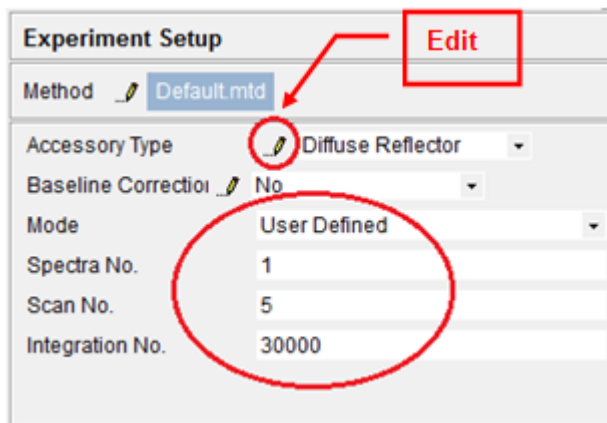
11. Click the **Sample** icon to measure sample.

Powder Sample Measurement

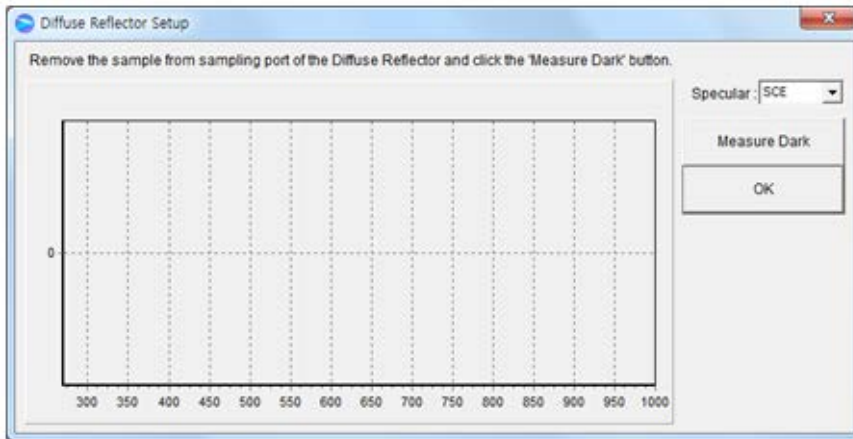
1. Launch the UV Lab software and select **Experiment Type** and click **OK**. Choose the **Reflectance** on the Data Type and **Diffuse Reflector** on the Sampling mode. Enter each parameter and click **OK**.



2. As Diffuse Reflector is chosen, make sure that the default values (Mode, Spectra No., Scan No. and Integration No.) are correct as below. Then click **Edit**.



3. The following window appears.



4. Remove the Sampling port on DRA-100 using a Philips screwdriver.

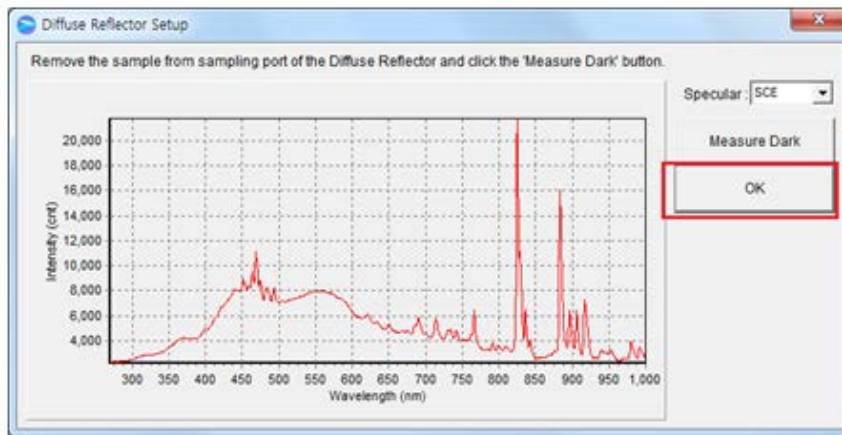


5. Put the Light Trapper on the sampling port of the DRA-100.

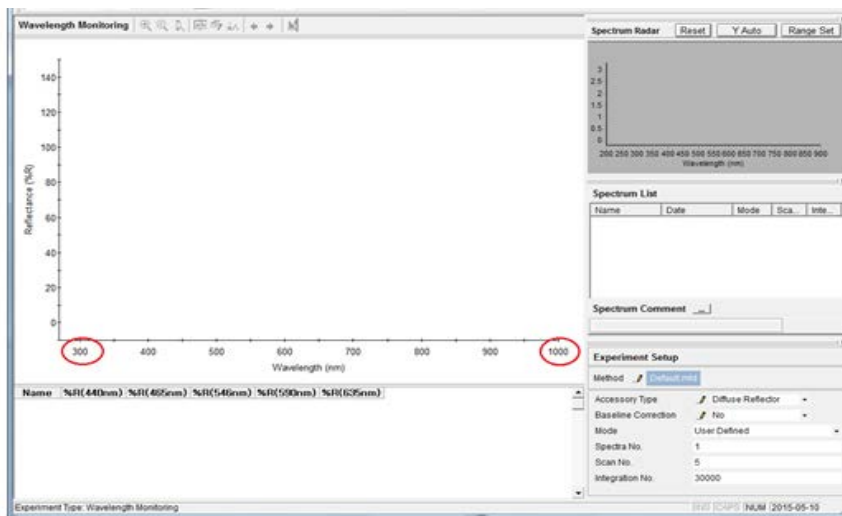


6. Click **Measure Dark**.

7. The following window appears. Click **OK**.



8. Check whether the range of wavelengths is set from 270 to 1000 nm.

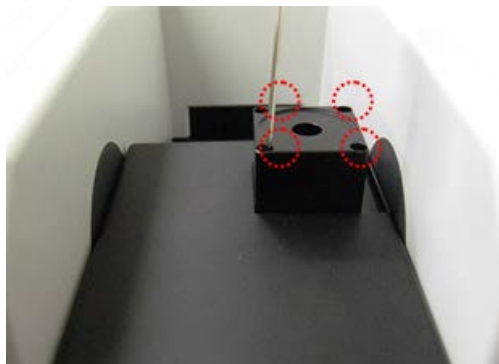


9. Put the White standard on the sampling port as below.



10. Click the **Run Blank** icon to measure blank.

11. After checking that the blank spectrum has 100% Reflectance value in the whole range, put the sample on the sampling port as below.
- a. Fix the powder sample holder on the DRA-100 using a screwdriver.



- b. Fill the powder sample in the cell and press powder sample gently, then put the powder cell into the powder sample holder.



NOTE: *When you remove the power cell and the powder cell holder, the powder cell should be taken out first and then powder cell holder in order. If the powder cell holder is taken out first, the powder cell falls down and the sample is silt out from it since the power cell is not fixed to the powder cell holder.*

- c. Put the Light Trapper on the powder cell holder.



12. Click the **Sample** icon to measure sample.

Troubleshooting

When the intensity value is low or high

- Change the Integration Number of the UV Lab Software.

| Experiment Setup | |
|---------------------|-------------------|
| Method | Default.mtd |
| Accessory Type | Diffuse Reflector |
| Baseline Correction | No |
| Mode | User Defined |
| Spectra No. | 1 |
| Scan No. | 5 |
| Integration No. | 30000 |

When the fan of the DRA-100 is not working

- Replace the fuse which is located in the fuse box of the DRA-100.
- Contact PerkinElmer or Supplier if the fan is still not working after replacement of the fuse.

When the lamp of the DRA-100 is not working

- Contact PerkinElmer or Supplier to replace a new lamp.
- If you are trying to turn on the lamp right after turn off the lamp, the lamp may not be turned on. When trying to turn on the lamp again, you need to wait for at 30 seconds after it is turned off.