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# Engineering Note

Topic: Mini-D2T & CHEM2000 (ISS-UV-VIS) Lamp Replacement

Products Affected: Mini-D2T and ISS-UV-VIS Light Sources

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## Description

The Mini-D2T and CHEM2000 ISS-UV-VIS light sources emit ultraviolet and visible light at approximately 200-1100nm. The lamp for these light sources has a lifetime of 800 to 1000 hours of standard use and must be replaced after its life ends or when it becomes weak and unstable. The following instructions are for replacing lamps for both light sources.

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### Caution

The beam emerging from the Mini-D2T and CHEM2000 ISS-UV-VIS produce ultraviolet radiation and can cause damage to the eye if used improperly. Safety goggles are recommended.

The Mini-D2T and CHEM2000 ISS-UV-VIS has an internal **high voltage** source and should not be opened or tampered with at any time when plugged into power.

The Mini-D2T and CHEM2000 ISS-UV-VIS should only be opened and/or modified by a trained electrical technician who has pertinent experience with electronic circuitry.

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## Replacement Lamp (DT-MINI-B)

The replacement lamp for the Mini-D2T and ISS-UV-VIS is a small, white bulb approximately 1 inch long and  $\frac{3}{4}$  inches in diameter. There are two wire leads that extrude from the side of the lamp and two short metal leads that are found at the lamp's rear. It is critical that if the lamp is cracked or damaged in any way that it not be installed. In this case, please contact Ocean Optics for a new replacement part: DT-MINI-B.

## Required Tools

- ❑ A standard Phillips-head screwdriver
- ❑ A standard flat-head screwdriver (ISS-UV-VIS)
- ❑ An Allen wrench (included with replacement lamp)

## Mini-D2T Lamp

The Mini-D2T is a standalone unit approximately 5.5x4.25x1.5 inches. It requires a 12V power adapter, which attaches to the rear of the unit.

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### WARNING

**Absolutely do *not* attempt this installation with power plugged into the unit. Severe shock and/or burns may occur due to high voltage if power is connected.**

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## Installing the Mini-D2T Replacement Lamp

### ► Procedure

1. Make sure the unit is in the off position and unplugged from the 12V power adapter.
2. Remove the two Phillips screws from the rear of the unit.
3. Slide out circuit card by gently pulling the back panel outward (away from unit).
4. Remove the locking screw and nut from the circuit board and copper shielding (located behind the indicator LED) and set aside.
5. Remove the slotted screw on the opposite side of the copper shield and set it aside.
6. Gently pull the copper shield up and set aside with its screw and locking nut.
7. There are four wire leads coming from the lamp to the circuit board (3 black and 1 red). These can be unhooked from the board by pulling up. If they are hard to pull up, try short twists back and forth while pulling up. Unhook all four wire leads.
8. Use the Allen wrench to remove the lamp setscrew (located on the side of the black block box) that holds the lamp. Do *not* remove the setscrew, which is inserted in the silver barrel of the fiber connector.
9. Remove the old lamp from board and holder and set it aside.
10. Before inserting new lamp, verify that the aperture window of the new lamp is free of dirt or smudges. The lamp window can be cleaned with alcohol on a swab.
11. Insert the new lamp into the holder.
12. While applying force so that the lamp is flat against the holder, tighten the setscrew so lamp does not move freely.

13. Attach leads to the circuit card terminal posts. There is no polarity for the two rear leads. They can be attached either way to terminal posts: LP1 and LP2. The side leads do have required polarity. The red wire lead must be mounted to the inner post, near the transformer T1. The black side wire must be attached to the terminal post near the front edge of the circuit card (near component R16).
14. Once the lamp and its connections are secure, place the copper shield back on the circuit card. Be sure to screw the shield down with the screws and nut removed in Steps 4 and 5.
15. Reinsert the circuit card assembly into the housing of the unit.
16. Slide the card back into the housing. Be sure the fiber connector and LED indicator extend out from the front panel correctly.
17. Replace the Phillips screws (removed in Step 2) back into the rear panel. Now you are ready to test the new lamp.

## Testing the Mini-D2T Lamp

### ► **Procedure**

1. Connect a fiber optic cable from the Mini-D2T to a light sensor or spectrophotometer.
2. Connect the 12V-power supply.

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### **WARNING**

**Do not verify the lamp ignition by looking directly into the light source.**

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3. Place the switch in the ON position. It may take up to two minutes for the new lamp to ignite and turn on. If you do not see the correct spectrum or intensity in the first two minutes, verify that your spectrometer/sensor is connected correctly and is actively collecting light signals.

If all instruments are verified and the lamp is not giving out the correct spectrum, please contact Ocean Optics Technical Support.

If you do see the expected spectrum, then the new lamp is functioning correctly.

4. Leave the lamp on for 1½ to 2 hours so it properly adjusts and settles to the electronic circuitry. This is required for the lamp stability.

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### **Note**

While lamp is settling, remove the fiber to avoid fiber solarization.

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# CHEM2000 ISS-UV-VIS (Integrated Sampling System) Lamp

The CHEM2000 ISS-UV-VIS is a Mini-D2T module with a mounted cuvette holder attachment. The procedure for opening its housing is different from the standard Mini-D2T.

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## WARNING

**Absolutely do *not* attempt this installation with power plugged into the unit.  
Severe shock and/or burns may occur due to high voltage if power is connected.**

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## Installing the CHEM2000 ISS-UV-VIS Replacement Lamp

### ► Procedure

1. Make sure the unit is in the off position and unplugged from the 12V power adapter. Remove the two Jack screws on the 15-pin connector from the rear of the unit.
2. Partially lift the Ocean Optics Inc. sticker from the front panel near the LED indicator. This provides access to the Phillips screw that attaches the front plate to the housing. Remove this screw and set it aside.
3. Gently pull the front panel forward from the rest of the housing. The circuit card should follow the front panel out of the main housing. Set aside the main housing.
4. Remove the locking screw and nut from the circuit board and copper shielding (located behind the indicator LED) and set aside.
5. Remove the slotted screw on the opposite side of the copper shield and set it aside.
6. Gently pull the copper shield up and set aside with its screw and locking nut.
7. There are four wire leads coming from the lamp to the circuit board (3 black and 1 red). These can be unhooked from the board by pulling up. If they are hard to pull up, try short twists back and forth while pulling up. Unhook all four wire leads.
8. Use the Allen wrench to remove the lamp setscrew (located on the side of the black block box) that holds the lamp. Do *not* remove the setscrew, which is inserted in the silver barrel of the fiber connector.
9. Remove the old lamp from board and holder and set it aside.
10. Before inserting new lamp, verify that the aperture window of the new lamp is free of dirt or smudges. The lamp window can be cleaned with alcohol on a swab.
11. Insert the new lamp into the holder.
12. While applying force so that the lamp is flat against the holder, tighten the setscrew so lamp does not move freely.

13. Attach leads to the circuit card terminal posts. There is no polarity for the two rear leads. They can be attached either way to terminal posts: LP1 and LP2. The side leads do have required polarity. The red wire lead must be mounted to the inner post, near the transformer T1. The black side wire must be attached to the terminal post near the front edge of the circuit card (near component R16).
14. Once the lamp and its connections are secure, place the copper shield back on the circuit card. Be sure to screw the shield down with the screws and nut removed in Steps 4 and 5.
15. After lamp replacement reinsert circuit card assembly into the main housing.
16. Reinsert screws removed from Steps 2, 4 and 5.
17. Replace or fold down the sticker. Now you are ready to test the new lamp.

## Testing the CHEM2000 ISS-UV-VIS Lamp

### ► **Procedure**

1. Connect a fiber optic cable from the ISS-UV-VIS to a light sensor or spectrophotometer.
2. Connect the 12V-power supply.

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### **WARNING**

**Do not verify the lamp ignition by looking directly into the light source.**

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3. Place the switch in the ON position.
4. It may take up to two minutes for the new lamp to ignite and turn on. If you do not see the correct spectrum or intensity in the first two minutes, verify that your spectrometer/sensor is connected correctly and is actively collecting light signals.

If all instruments are verified and the lamp is not giving out the correct spectrum, please contact Ocean Optics Technical Support.

If you do see the expected spectrum, then the new lamp is functioning correctly.

5. Leave the lamp on for 1½ to 2 hours so it properly adjusts and settles to the electronic circuitry. This is required for the lamp stability.

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### **Note**

While the lamp is settling, remove the fiber to avoid fiber solarization.

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## Troubleshooting

### ► **Procedure**

If your replacement lamp is not lighting up when the switch is in the ON position, check the following:

1. Is the power supply correct? It should be a 12 Volt with center positive 2.1mm jack.
2. Is the power supply plugged in to an outlet that is enabled and standard for the power supply being used?