

DT-1000 Deuterium Tungsten Halogen Light Source

The **DT-1000 DEUTERIUM TUNGSTEN HALOGEN LIGHT SOURCE** combines the continuous spectrum of a deuterium UV light source and a tungsten-halogen VIS/Shortwave NIR light source in a single optical path. The combined light source produces a powerful, stable output from ~200-1100 nm. It also has a highly stabilized microprocessor-based power supply designed for optimum stability.

Parts Included

- ◆ DT-1000 Deuterium Tungsten Halogen Light Source
- ◆ Safety eyewear for protection against dangerous ultraviolet radiation
- ◆ Power cord for connecting DT-1000 to outlet
- ◆ Allen wrench for adjusting the focus of the collimating lens

Caution!

- ☠ The beam emerging from the DT-1000 produces visible light and/or invisible ultraviolet radiation. Direct contact with the beam could cause serious eye injury.
- ☠ Safety eyewear must be worn at all times while operating the DT-1000. Do not remove any safety device installed.
- ☠ Dangerous voltages present.
- ⚠ Only qualified service personnel should service the DT-1000.
- ⚠ This instrument should not be used for any clinical or diagnostic purposes.
- ⚠ Handle with care. Dropping the instrument may cause permanent damage.
- ⚠ For optimum performance below 250 nm, use a solarization-resistant fiber with this lamp.

Operation

Allow several minutes for the lamp to warm up and for the power to stabilize, regardless of the bulb being used. Best results are obtained after 30 minutes. The spectral output as delivered by an optical fiber will decrease significantly at wavelengths lower than 250 nm due to attenuation in the lamp envelope, the decrease in detector efficiency in the spectrometer, and attenuation by the fiber.

1. Put on safety eyewear.
2. Lift the black protective shutter covering the fiber optic port. Install an optical fiber. (For best results, use our solarization-resistant fibers.)
3. Plug the power cord into the rear of the DT-1000. Plug the other end into a 110 VAC outlet.
4. To turn on the power for the DT-1000, flip the power switch at the rear of the unit, just above where the power cord connects to the DT-1000. When the power is on, the green **Power On** light located at the bottom right of the front panel will light. At this time, the user can now power up the deuterium or tungsten-halogen source or both. (See the following **Operating the Deuterium Source** and **Operating the Tungsten-Halogen Source** sections for more information.)
5. To turn off the DT-1000, both deuterium and tungsten-halogen sources must be turned off first. Only then can the user flip the power switch at the rear of the unit to the off position. The green **Power On** light will turn off.
6. Lift up the black protective shutter and disconnect your optical fiber from the SMA connector.

Operating the Deuterium Source

1. To power the deuterium lamp, push in the **UV Start** button located on the front panel. This white button turns on the deuterium lamp. Pushing in the **UV Start** button initiates the start-up sequence for the lamp. First, the heater in the deuterium lamp ionizes the available deuterium. At this point, the yellow **Heater On** light on the front panel will light. After ~30 seconds, the red **UV On** light located at the top of the front panel will light. (The **Heater On** light will turn off at the same time.)
2. To turn off the deuterium lamp, press the white **UV Off** button located on the front panel. The red **UV On** light should go out.

Operating the Tungsten-Halogen Source

1. To power the tungsten-halogen lamp, push in the white button **Visible On**. The red **Vis. On** light will come on.
2. To turn off the tungsten-halogen lamp, press the white **Visible On** button located on the front panel. The red **Vis. On** light will go out.

Bulb Replacement

Replacing the Deuterium Bulb

1. Order a deuterium replacement bulb, item DT-1000-BD, from Ocean Optics.
2. Make sure the DT-1000 is turned off, the power cord is disconnected, and the source has cooled.
3. Use a Phillips-head screwdriver to remove all 12 screws from the side panels of the DT-1000 casing. **Do not** remove *any* screws from the front, back, or bottom panels. Remove the cover.
4. Locate the deuterium bulb. It is located at the front of the housing, mounted on a black platform. Three wires lead from the bottom of the bulb to the green electronic board: one red wire and two black wires.
5. Use a Phillips-head screwdriver to loosen the screws securing these three wires to the green electronic board. Once the screws are loose, gently remove the red wire and the two black wires. You do not need to completely remove the screws to detach the wires. (Note that on the green electronic board, just to the right of each wire, is a letter. To the right of the red wire is the letter "A". To the right of one black wire is the letter "H" and to the right of the second black wire is the letter "C".)
6. Use a Phillips-head screwdriver to remove the two screws securing the bulb to the black platform.
7. Remove the old bulb unit.
8. Inspect the new bulb unit, but **avoid touching the glass casing** (or envelope) around the bulb, as the oils from your skin will deteriorate the bulb. Inside the envelope is a triangle-shaped filament. The filament has a **square** opening. The light passes through the square opening to the collimating lens. Take the new bulb, carefully feeding the three wires through the hole in the black platform, and position it so that the square opening in the filament faces the collimating lens.
9. Screw in the two screws that secure the bulb to the black platform.
10. Secure the three wires to the green electronic board. Attach the red wire to the top screw, labeled "A". Attach the black wires to the screws on the board labeled "H" and "C". **It does not matter which black wire is attached to screw "H" or "C".**
11. Put the DT-1000 casing back on and secure it with the 12 screws.

Replacing the Tungsten-Halogen Bulb

1. Order a tungsten-halogen replacement bulb, item DT-1000-BT, from Ocean Optics.
2. Remove all 12 screws from the side panels of the DT-1000 casing using a Phillips-head screwdriver. **Do not** remove *any* screws from the front, back, or bottom panels. Remove the cover.
3. Locate the tungsten-halogen bulb. It is inserted on the top of a cylindrical unit held by a set screw in a hole in the black platform. The cylindrical unit is positioned behind the deuterium bulb. Two thin wires lead from the bottom of the unit to a socket on the electronic board.

4. Gently grip the top of the bulb and pull it away from the cylindrical unit. Discard the bulb.
 5. Insert the new bulb into the top of the cylinder, being careful to position the bulb's pins over the holes in the top of the cylinder.
- Ⓜ The cylindrical unit is held in place with a small set screw. By loosening it, the user can slide the bulb unit up and down, positioning it in front of the attenuator, a metal disc that attenuates the light before going through the collimating lens. Another set screw holds the attenuator in place.
6. Put the DT-1000 casing back on and secure it with the 12 screws.

Specifications

Spectral range:	~200-1100 nm
Time to stabilized output:	~30 minutes
Deuterium bulb lifetime:	1,000 hours
Tungsten-halogen bulb lifetime:	900 hours
Power consumption:	25-30 Watts
Stability:	peak-to-peak = 0.05% (maximum) drift of +/-0.5%/hour
Aperture:	0.5 mm (at lamp)
Connector:	SMA 905
Lamp voltage:	85 volts DC (nominal)
Operating lamp current:	300 mA DC (+/- 1mA)
Inputs:	trigger inputs for lamp (on/off)
Outputs:	levels for lamp (on/off), filament (on/off)
Power requirements:	120 volts AC @ 0.50 A, 50-60 Hz 220 volts AC @ 0.25 A, 50-60 Hz 100 volts AC @ 0.60 A, 50-60 Hz 240 volts AC @ 0.20 A, 50-60 Hz