

SP Spectral Products

111 Highland Drive - Putnam, CT 06260
Phone 860-928-5834 - Fax 860-928-2676

www.spectralproducts.com

Deuterium and Tungsten-Halogen Hybrid Light Source

- ASBN-D1-WXXX / ASBN-D2-WXXX-

Operation Manual



SP SPECTRAL PRODUCTS



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Important Safety Notices

1. Never look directly into the light beam, including through the cooling fan while light is on, as this can cause eye damage.
2. Do not remove or modify any installed safety devices on this equipment. Doing so will void your warranty and create an unsafe operating environment.
3. Do not use the unit if it is damaged in any way. Contact your dealer for repair or replacement information.

Warranty and Liability

This SP's product is warranted against defects in material and workmanship for a period of one year from the date of shipment. During the warranty period, Spectral Products will, without charge, repair or replace, at its discretion, the defective product or component parts.

For warranty service or repair, this product must be returned to a service facility designated by Spectral Products (SP). For products returned under warranty, the Buyer shall prepay shipping charges (including shipping charges, duties, and taxes for products returned to SP from another country), and SP will pay for shipping charges to return the product to the Buyer.

This warranty does not apply in the event of misuse or abuse of the product or as a result of unauthorized alterations, modifications or repairs, if the serial number is altered, defaced or removed, the improper or inadequate maintenance by the Buyer, Buyer-supplied software or interfacing, or improper site preparation or maintenance. No other warranty is expressed or implied. SP shall not be liable for any consequential damages, including without limitation, damages resulting from loss of use, as permitted by law.



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Specification

The following tables provide information on our high power tungsten-halogen light sources.

Overview

| | |
|--------------------|---|
| Mount | Tapered flange, adjustable, Post mounting for standalone operation |
| Housing | Air cooled w/ two focusable fused silica doublet collection lens sets, 1" size w/ focusable Al coating mirror, 1" size Dimension: 11.0" X 11.5" X 5.5" |
| Output type | Monochromator Matching (M) : CM110, DK240, or DK480 |
| | Fiber coupling (F) : SMA905 or FC |

Electric

| | | |
|-------------------------|------------------------------|---|
| Tungsten-Halogen | Electric Power Input | Input Voltage: 85-264 Vac, 47-63Hz Inrush Current: 30A/100V, 40A/200V Over-voltage protection: Clamp, 115-135% Current limit: 105-150% typically, self-reset fold back Safety: UL/TUV/CE Operation Temperature: 0 to 50 °C |
| | Electric Power Output | Vdc: 12V (50-100W), 24V (150W) Max. Current: 12.5A (50-100W), 8.4A (150W) Ripple/Noise: 100mV Peak to Peak, typically. Regulation: +/-0.5% typically |
| Deuterium | Electric Power Input | Input Voltage: 24 Vdc regulated (<45W), 5Vdc (TTL) disable input Input Current: 2A |
| | Electric Power Output | Anode: 60-100Vdc / 30 W max Trigger pulse: 600±50 Vpk continuous (Anode Vdc included) Heater Warm up: ~20-30 seconds Regulation: +/-0.5% typically |
| | Others | Temperature: 0-40 °C Humidity: ≤95% Cooling: 20 CFM of forced air across the component side |



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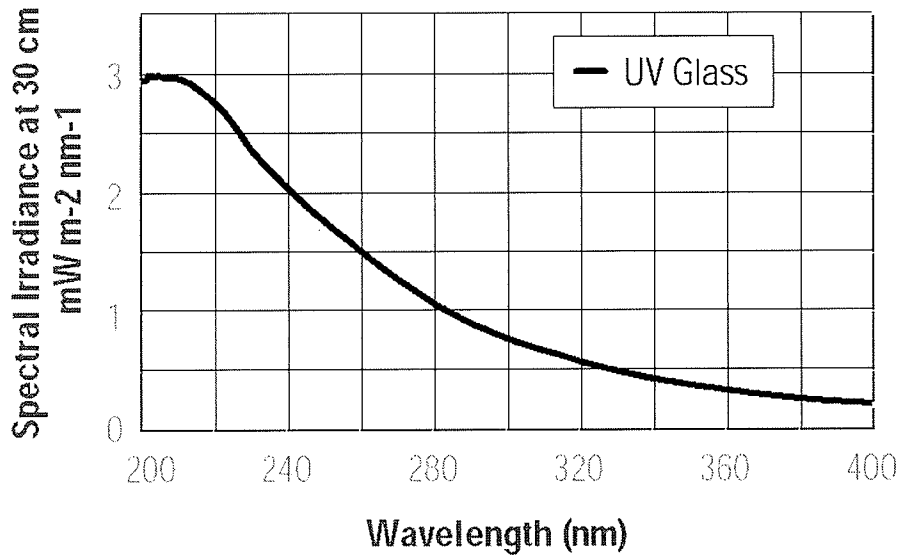
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Component

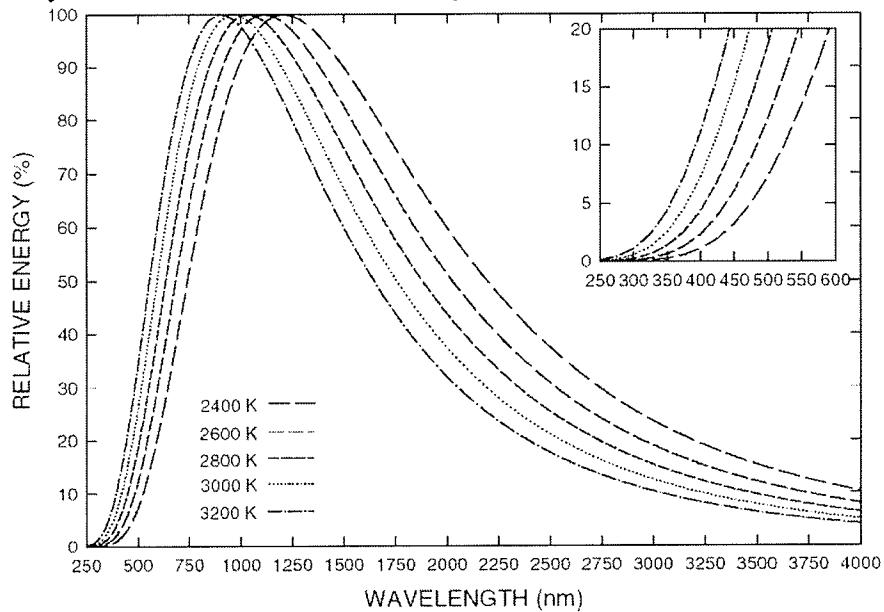
| | | |
|---------------|-------------------------|--|
| Optics | Lens | 2 X 1" UV grade fused silica (quartz) plano-convex lens, R=12.9mm, f=25.0mm (nominal), F# in the housing = ~1.0 |
| | Mirror | 1.0" UV protected Al coating mirror, f=12.5mm |
| Lamp | Tungsten-Halogen | 50W Filament size: 2.5mm x 4.2mm Voltage: 12.0 V (nominal) Average Life: 2,000 hours (nominal) Light Output: 900 lumens Color Temperature: 3000°K |
| | | 75W Filament size: 1.6mm x 5.0mm Voltage: 12.0 V (nominal) Average Life: 2,000 hours (nominal) Light Output: 1400 lumens Color Temperature: 3000°K |
| | | 100W Filament size: 2.3mm x 5.2mm Voltage: 12.0 V (nominal) Average Life: 2,000 hours (nominal) Light Output: 2000 lumens Color Temperature: 3000°K |
| | | 150W-L Filament size: 3.0mm x 5.8mm Voltage: 24.0 V (nominal) Average Life: 200 hours (nominal) Light Output: 5000 lumens Color Temperature: 3200°K |
| | | 150W-H Filament size: 3.1mm x 6.2mm Voltage: 24.0 V (nominal) Average Life: 50 hours (nominal) Light Output: 6000 lumens Color Temperature: 3400°K |
| | Deuterium | 30W Window Material: UV glass Electrical connections: Flex Leads (2 Black for filament, 1 Red for Anode) Starting Voltage: 350 Vdc min Operating Voltage: 65-80 Vdc Operating Current: 300 mAdc Filament Current (starting): 0.8-1.0 Amp Filament Voltage: 9.0-11.0 V (starting), 6.0-7.0 (operating) Arc diameter: 2.0mm Life time: 1000 hours (to 50% of initial light output at 300 mAdc) Window Transmission at 190nm: 60% |

Spectrum

The deuterium (D2) lamp is designed for use in spectroscopic applications where high intensity and stability in the 190 to 400nm band is needed. Above 400nm, some spiky spectra will be detected also.



The Tungsten-halogen light source is a well known near black body radiation source. Its spectrum is also very similar with those of black body radiation.

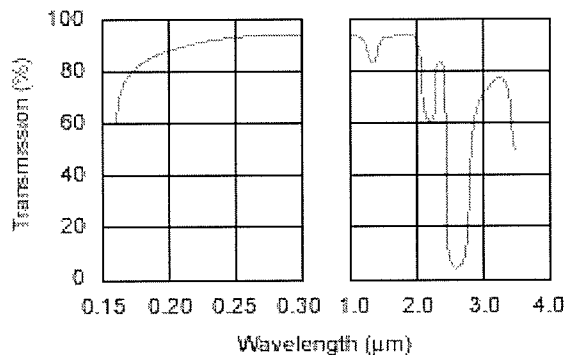


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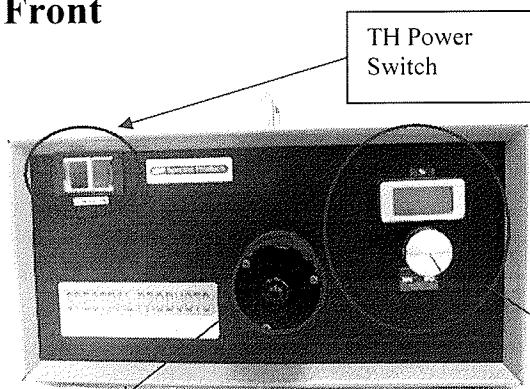
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The envelope of tungsten-halogen lamps is made of quartz. Quartz transmittance, therefore needs to be considered.

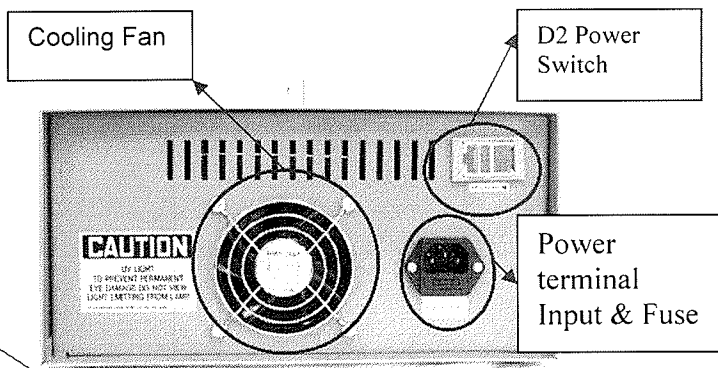


Operation

Front



Back



Fiber coupling output. For monochromator coupling, remove the fiber connection plug.

Driving voltage (%) Indicator & Control Knob*

* Only valid when power adjustable option (ASBN-W-PV) is selected.

| Component | Description |
|----------------------|--|
| Power terminal input | Connects power cable to provide voltage to our deuterium and high power tungsten-halogen hybrid light source. One main power supply provides the input voltages on both lamps. |



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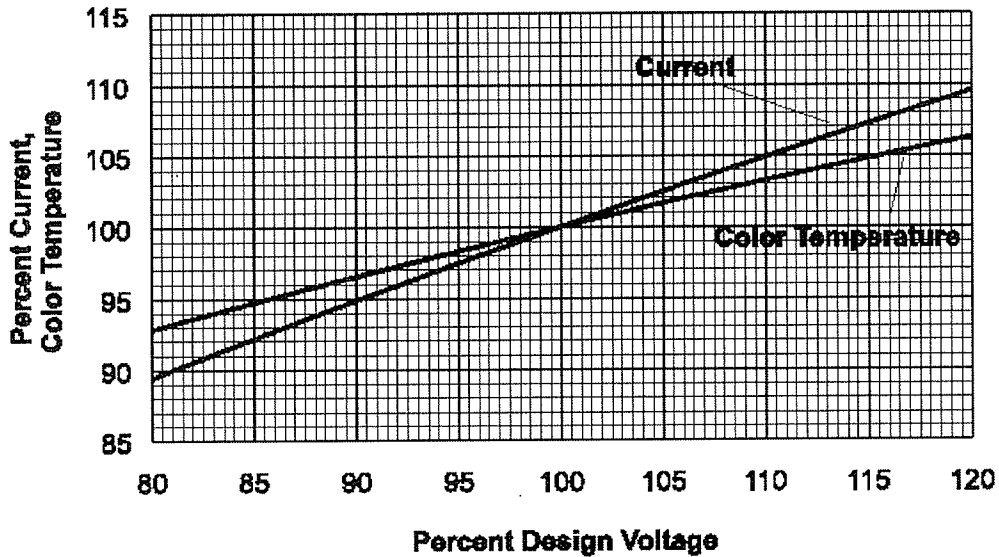
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| Component | Description |
|----------------------------------|--|
| Power switch | Turns on/off to supply power to the deuterium lamp and the tungsten-halogen lamp. The BLUE switch on the back side is for the deuterium application and the RED switch on the front of the unit is for the tungsten-halogen application. The switch light illuminates when the switch is in the ON position. Note: It takes ~20-30 seconds to warm up the deuterium power supply so the deuterium light doesn't come on immediately when the BLUE is on. |
| Fuse | Contains the fuse to protect the unit against overload. Fuse type: For main 24V power supply: 5A/250V For deuterium relay power supply: 2A/250V |
| Cooling fan | Cools the interior of the light source housing. Note: Do not look into the light beam through this fan. |
| Output | Fiber coupling and Monochromator coupling are possible. For monochromator coupling, remove the fiber connection plug. The standard monochromator coupling is for CM110/CM112. DK series users should inform SP to obtain the correct coupling. |
| Driving voltage indicator | For ASBN-W-PV option user: Shows the current percentage of the designed driving voltage for the tungsten-halogen lamp. The designed driving voltage of 50-100W lamps is 12V and that of 150W is 24V. It varies from 0% to 100%. |
| Control Knob | For ASBN-W-PV option user: Controls the relative tungsten-halogen driving voltage from ~0% (min) to ~100% (max). |

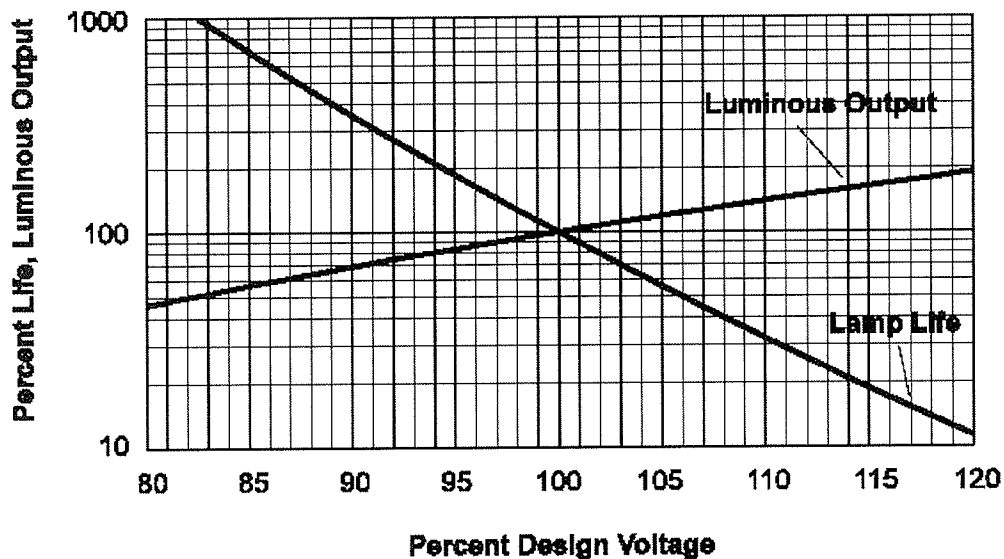
Relationship Curves for ASNM-W-PV

The following curves show the relationship between the driving voltage setting and the color temperature/current/luminous power/life time on/of the lamp.

Color Temperature/Current vs. Driving Voltage:



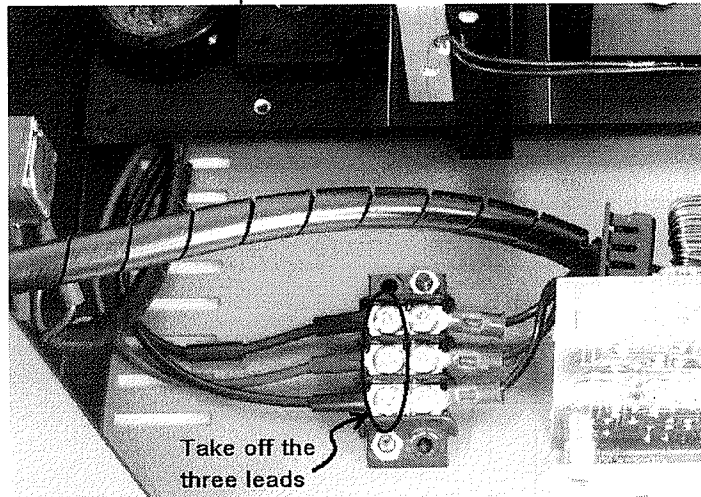
Life time/Luminous power vs. Driving Voltage:



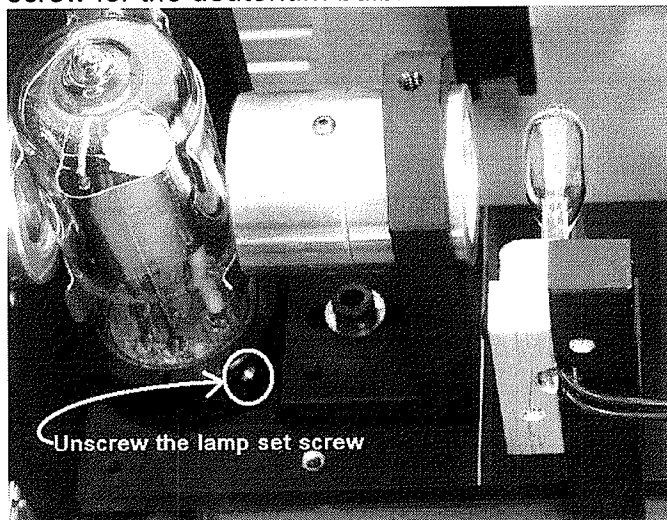
Bulb Replacement

Replacing the Deuterium lamp bulb

1. Turn off all power.
2. Wait until the lamp cools down.
3. Remove housing.
4. Remove heat shield.
5. Take off the three deuterium lamp leads on the bottom.

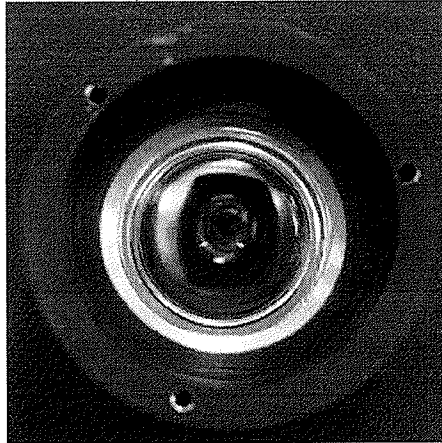


6. Unscrew the set-screw for the deuterium bulb.



7. Take out the old bulb and replace the new one.

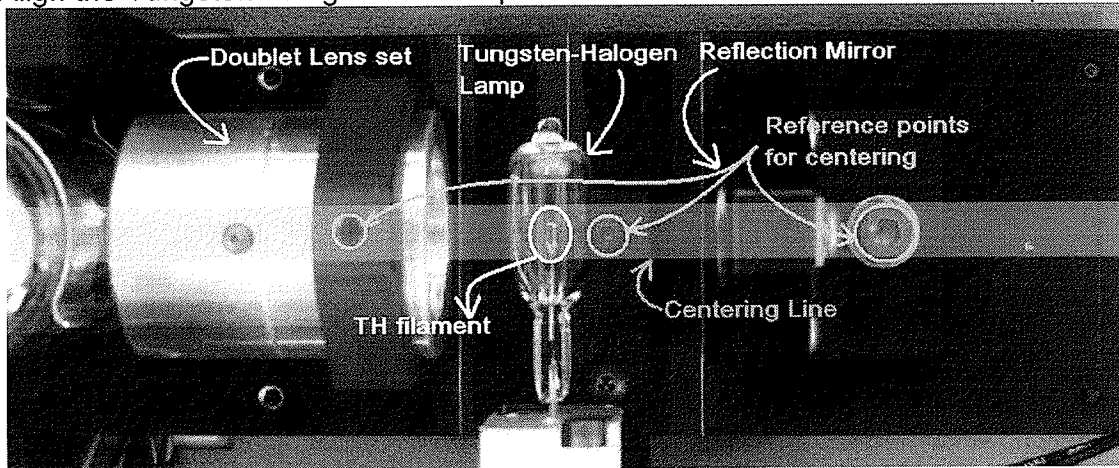
8. Adjust the bulb to be centered properly looking through the focusing lens set. If there is a fiber coupling plug attached, please take it off first.



NOTE: When touching the new deuterium lamp, please be careful not to touch it with a bare hand.

Replacing the Tungsten-Halogen lamp bulb

1. Turn off all power.
2. Wait until the lamp cools down.
3. Remove housing.
4. Remove heat shield.
5. Replace the lamp
6. Align the Tungsten-halogen filament position to be in the center line of the optical axis.



NOTE: All the optical components were properly aligned by SP. Do not touch any mounting screws. Adjust the bulb itself when aligning the filament position.



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Technical Support

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Directions for Replacing the Digital Display

1. Remove the cover to the light source. Lift off the heat shield. The display will be clearly visible.
2. Remove the nut and washer from the display.
3. Snip off the color coded wires and remove the old display.
4. Remove the new display from the package, uncoil the wires and remove the nut and washer.
5. Pass the wires through the front cover. Do not attach it to the housing yet.
6. Slide a small piece of heat shrink onto each wire, then strip and solder the corresponding wires together.
7. Slide the heat shrink over the soldered wire section and heat to shrink the wrap in place.
8. Replace the heat shield but leave the cover off.
9. Turn the unit on.
10. On the back of the display, under the adhesive backed rubber piece, there is a small screw. Adjust that screw (clockwise) until the display reads 100%.
11. Remove the paper backing from the rubber. Position the display so the threaded part is through the hole in the housing and stick securely.
12. Replace the washer and nut and tie off any excess wiring.
13. Replace the cover.