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SLS254 - May 18, 2018

Item # SLS254 was discontinued on May 18, 2018. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

STABILIZED DEUTERIUM UV LIGHT SOURCE

- ▶ 200 - 700 nm Output with Continuous UV Spectrum from 200 - 400 nm
- ▶ Long 2000 Hour Lifespan
- ▶ SMA905 Fiber-Coupled Output
- ▶ Compatible with SM1 Components and 30 mm Cage Systems

Application Idea



SLS204
Deuterium Light Source



SLS254
Replacement Deuterium Bulb



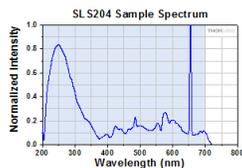
SLS204 Shown with Included M114L01 Solarization-Resistant Patch Cable

[Hide Overview](#)

OVERVIEW

Features

- Deuterium Light Source for 200 - 700 nm
- Stabilized 30 W Bulb Intensity Using Closed-Feedback Loop
- 0.02% Per Hour and 0.1% Per °C Output Power Drift
- SMA905 Fiber-Coupled Output with Dust Cover
- Internally SM1-Threaded (1.035"-40) Aperture
- Compatible with 30 mm Cage Systems and Ø1" Lens Tubes
- Replacement Light Bulb Available Separately
- Location-Specific Power Cord Included



Click to Enlarge
The measured spectral power distribution for the SLS204 Light Source. The blue-shaded region indicates the lamp's operating wavelength range.



Click to Enlarge
The fiber adapter and dust cap on the output port can be removed to use 30 mm cage system components and SM1-threaded components with the SLS204.

Thorlabs' SLS204 Deuterium Light Source provides stable illumination from 200 nm to 700 nm. The strong continuous spectrum at short UV wavelengths (200 - 400 nm) makes this an ideal source for UV spectroscopy applications. A closed-loop feedback system stabilizes the 30 W bulb which is coupled into a SMA905 bulkhead for connecting to a fiber patch cable. A low-noise fan cools the light source and bulb enabling continuous operation for >50 hours (see the *Graphs* tab for lamp stability over time). Each SLS204 includes a location-specific power cord.

The SLS204 includes a M114L01 Solarization-Resistant Multimode Fiber Patch Cable. The light source has a typical fiber-coupled output power of 0.1 mW using the included patch cable and a typical 2 mW output power when used in a free-space configuration.

Within the light source housing is a deuterium bulb and a series of UV fused silica lenses to focus the emitted light on the fiber port. Within the bulb, an electric arc is generated that excites the gaseous deuterium causing molecular emission of a continuous UV spectrum. In addition, two other major spectrum peaks occur at 486 nm and 656 nm. The deuterium bulb in the SLS204 has a lifetime of 2000 hours. Replacement bulbs are available for purchase separately. Please see the *Bulb Replacement* tab for detailed instructions on how to replace the bulb in these lamps.

The SLS204 comes equipped with an SMA905 fiber adapter on the output aperture and a hinged dust cap. The adapter can be removed to expose internal SM1 (1.035"-40) threading that is compatible with other externally SM1-threaded fiber adapters. The dust cap can also be removed using the included 5/64" hex key or balldriver in order to access the two of the four 4-40 tapped holes for 30 mm cage rods that provide compatibility with 30 mm cage system components. Using the cage system, it is possible to incorporate various optic mounts that are centered along the optical center of the lamp (as seen in the image above).

Please note that the SLS204 generates high-intensity UV light. Wear appropriate eye protection and do not look directly at the output during operation. Do not place hands or body parts in the path of the beam.

[Hide Specs](#)

SPECS

| Item # | SLS204 |
|-----------------------|--------------|
| Wavelength Range | 200 - 700 nm |
| Bulb Electrical Power | 30 W |

| | |
|---|---|
| Output Fiber | M114L01 Patch Cable (Included) Ø600 µm, 0.22 NA, SMA905 Connectors |
| Fiber-Coupled Output Power ^a | 0.1 mW (Typical) |
| Free-Space Output Power ^b | 2 mW (Typical) |
| Output Power Drift | 0.02% Per Hour (Typical) 0.1% Per °C (Typical) |
| Output Power Stability ^c | <0.06% |
| Bulb Lifetime ^d | 2000 h |
| Power Supply | 100 - 240 VAC, 50 - 60 Hz |
| Operating Temperature | 0 - 40 °C |
| Storage Temperature | -15 - 70 °C |
| Dimensions (L x W x H) | 246.3 mm x 170.0 mm x 129.8 mm (9.70" x 6.69" x 5.11") |

- Measured with M114L01 Fiber Patch Cable at Beginning of Bulb Lifetime
- Measured at the Output Port with the Fiber Adapter Removed at Beginning of Bulb Lifetime
- Standard deviation of optical power measured at room temperature over a 1 hour period (after 45 minutes of warm-up) with a 1 Hz sampling rate.
- Defined as the time it takes for the bulb to decrease to ≤50% of the initial output intensity at 230 nm.



Click to Enlarge
SLS204 Back Panel

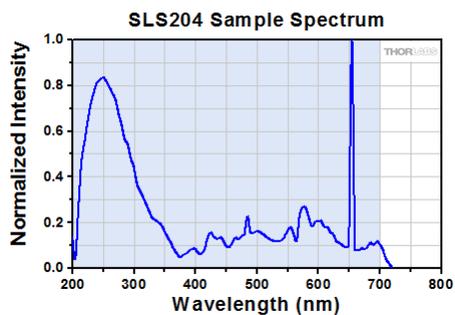


Click to Enlarge
SLS204 Front Panel

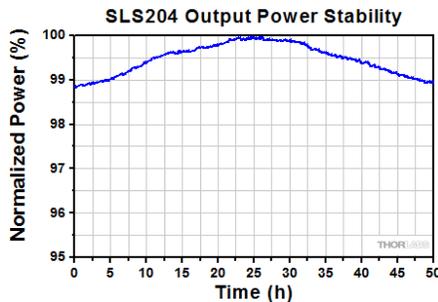
| Patch Cable Item # | Wavelength Range | NA | Core Diameter | Cladding Diameter | Coating Diameter | Bend Radius (Short Term) | Bend Radius (Long Term) |
|--------------------|------------------|------|---------------|-------------------|------------------|--------------------------|-------------------------|
| M114L01 | 180 - 1200 nm | 0.22 | 600 ± 12 µm | 660 ± 6 µm | 750 ± 20 µm | 80 mm | 159 mm |

[Hide Graphs](#)

GRAPHS



The measured spectral power distribution for the SLS204 Light Source. The blue-shaded region indicates the lamp's operating wavelength range. The continuous spectrum of the deuterium lamp extends from 200 nm - 400 nm. Please note that the lower apparent intensity of the output is due to detection limitations from 300 to 400 nm and <225 nm.



The output of the SLS204 over 50 hours of continuous operation. This graph does not include 45 minutes of warm-up to ignite the source and stabilize the output.

[Hide Bulb Replacement](#)

BULB REPLACEMENT

Bulb Handling

The bulbs used in a deuterium lamp operate at a very high temperature. If handled incorrectly, they will become a serious hazard to users and could potentially cause severe injury. It is critical to follow safety instructions when handling them.

The guidelines below describe correct bulb handling.

- Any dust or grease on the bulb will compromise the integrity of the bulb envelope, increasing the chance that the bulb will burst. Clean any dirt, oil, or lint away from the bulb with alcohol and a lint free cloth or tissue.



Click to Enlarge
The bulb can be held by the metal casing with

- Never bump, drop, apply excessive stress, or scratch the bulb. This could cause it to burst.
- Always transport the bulb in the provided protective case or cover until installation.
- Save the protective case or cover and packaging materials (box) for bulbs that have been used to their rated service life.
- Always wear gloves when handling the bulb; never hold the bulb by its envelope (see photo to the right). Thorlabs offers gloves that can be used for bulb handling.
- The bulb generates very high-intensity UV light output; wear the appropriate laser safety glasses during operation.
- The bulb gets very hot during operation. Always wait at least 10 minutes for the bulb to cool down before handling the bulb after operation.
- Electrostatic discharge (ESD) protection is recommended when handling the bulb.

gloved hands. Avoid making contact with the bulb envelope directly.

Bulb Installation

The instructions and photos to the right detail the recommended procedure for replacing the bulbs in the SLS204 Deuterium Light Source. Do not attempt to change the light bulb while the bulb and unit are hot. Allow at least 10 minutes after turning the lamp off before attempting to replace the light bulb.



We strongly recommend wearing gloves when replacing the bulb to prevent skin oils from being deposited onto the bulb. If you suspect the bulb is dirty, carefully clean it with alcohol before connecting it to a power supply.

Open the Lamp Housing

1. Use the included 2 mm (5/64") hex key to loosen the panel screw on the side of the light source.
2. Hold the bulb cover and pull to remove it.



Remove the Old Bulb

3. Press the two clamps on the sides of the connector at the same time and pull the connector from the socket to electrically disconnect the bulb.
4. Use the 2 mm (5/64") hex key to remove the two cap screws holding the bulb within the lamp.
5. Pull out the bulb by the metal housing; do not touch the bulb envelope.

Install the New Bulb

6. Place the replacement bulb within the lamp aligning the slot in the bulb base with the pin on the front side of the bulb holder. Tighten the two cap screws with the hex key and plug in the black connector to connect the bulb. Afterwards, replace the side panel and tighten the panel screw with the hex key.

[Hide Lamp Selection Guide](#)

LAMP SELECTION GUIDE

Below is a selection guide for all of our white-light, broadband illumination sources (or lamps). In addition to these sources, Thorlabs also offers an unmounted white-light LED, five white-light mounted LEDs, two white-light fiber-coupled LEDs, and three high-powered, white-light Solis™ LEDs.

| Lamp Selection Guide | | | | | | | | | | | |
|----------------------|----------------------------------|------------------------|------------------|---------------|--|---|-----------------------|---------------------|----------------------------|------------------|--|
| Item # | (Click to Enlarge; Not to Scale) | Emitter Type | Wavelength | Spectrum Plot | Output Coupling | Output Power | Bulb Electrical Power | Color Temperature | Lifetime | Replacement Bulb | |
| HPLS343 | | Plasma | 350 nm - 800 nm | | Liquid Light Guide | 4 W ^a (Typ.) | - | 6000 K ^b | 10 000 h ^c | HPLSB | |
| HPLS345 | | Plasma | 350 nm - 800 nm | | Liquid Light Guide | 7 W ^a (Typ.) | - | 6000 K ^b | 10 000 h ^c | HPLSB | |
| SLS201L(M) | | Tungsten-Halogen | 360 nm - 2600 nm | | Fiber Coupled (SMA), Liquid Light Guide, or Free Space | 10 mW ^d 500 mW ^e | 9 W | 2796 K | 10 000 h (Avg.) | SLS251 | |
| SLS202L(M) | | Tungsten | 450 nm - 5500 nm | | Fiber Coupled (SMA), Liquid Light Guide, or Free Space | 2 mW ^f 400 mW ^e | 7.2 W | 1900 K | 10 000 h (Avg.) | SLS252 | |
| SLS203L(M) | | Silicon Nitride Globar | 500 nm - 9000 nm | | Free Space | >1.5 W ^e | 24 W | 1500 K | 10 000 h (Avg.) | SLS253 | |
| SLS204 | | Deuterium | 200 nm - 700 nm | | Fiber Coupled (SMA) or Free Space | 0.1 mW ^{g,h} 2 mW ^e (Typ.) | 30 W | N/A | 2000 h ^c | SLS254 | |
| SLS301 | | Tungsten-Halogen | 360 nm - 3800 nm | | Free Space ⁱ | >1.6 W ^h | 150 W | 3400 K | 1000 h ^j (Avg.) | SLS301B | |
| SLS303 | | Silicon Nitride Globar | 550 nm - 15 μm | | Free Space | >4.5 W ^h | 70 W | 1200 K | 5000 h ^j (Avg.) | SLS303B | |
| SLS401 | | Xenon Arc | 240 nm - 2400 nm | | Free Space ⁱ | >1.3 W ^h | 150 W | 5800 K | 2000 h ^c | SLS401B | |
| SLS402 | | Mercury-Xenon Arc | 240 nm - 2400 nm | | Free Space ⁱ | >1.3 W ^h | 150 W | 6000 K | 2000 h ^c | SLS402B | |
| | | | | | | | | | 1000 to | OSL2B, | |

| | | | | | | | | | | |
|--------------------|---|-------------------------|------------------|---|----------------------------|---------------------------|---------------|---------------|----------------------------|--------------------|
| OSL2 |  | Tungsten-Halogen | 400 nm - 1300 nm |  | Fiber-Coupled Fiber Bundle | 1.4 W ^k | 150 W | 3200 K | 10 000 h to 50% Brightness | OSL2B2, or OSL2BIR |
| QTH10(M) |  | Quartz Tungsten-Halogen | 400 nm - 2200 nm |  | Free Space | 50 mW ^l (Typ.) | 10 W | 2800 K | 2000 h | QTH10B |
| XCITE120LED |  | LED | 370 nm - 700 nm |  | Free Space | Not Available | Not Available | Not Available | >25 000 h | Not Available |
| XCITE200DC |  | Mercury Arc | 340 nm - 800 nm |  | Liquid Light Guide | Not Available | Not Available | Not Available | >2500 h (Typ.) | Not Available |

- Measured at the output of the liquid light guide, when both the bulb and the LLG are at start-of-life.
- Prior to LLG
- Average lifetime of bulb, defined as the total operation time before the maximum optical output power of the bulb reaches 50% of its original output.
- Fiber-coupled optical power, measured with included M28L01 fiber patch cable at beginning of bulb lifetime.
- Free-space optical power, measured at the output port of the light source with the fiber coupler removed.
- Measured with Thorlabs' MZ41L1 ZrF₄ MIR patch cable at the beginning of bulb lifetime.
- Measured with Thorlabs' M114L01 Solarization-Resistant Patch Cable at the beginning of bulb lifetime.
- At Beginning of Bulb Lifetime
- Liquid light guide (LLG) adapters are available separately to couple the free-space output.
- Average lifetime of bulb, defined as the time elapsed when the controller cannot stabilize the output power of the bulb.
- Power of Fiber Tip at Maximum Bulb Intensity
- Measured by focusing the output beam after the ACL5040U condenser lens onto an S302C thermal power sensor with an MPD508762-90-P01 protected silver off-axis parabolic mirror.



[Hide](#)

| Part Number | Description | Price | Availability |
|-------------|--|------------|--------------|
| SLS204 | Customer Inspired! Stabilized Deuterium Light Source, 200 - 700 nm | \$2,800.00 | Today |
| SLS254 | Replacement Deuterium Bulb for the SLS204 | \$610.00 | Today |