

Lamp Power Supply

OPERATION MANUAL



Photon Technology International

WARNING: Operation or adjustment of this product inconsistent with the instructions herein can result in hazardous radiation exposure.

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PTI Standard Instrument Warranty

Warranty Period and Extent

Photon Technology International (PTI) warrants that its instruments will be delivered in a functional state and free from defect, and will meet stated specifications for a period of one (1) year. The warranty period will start on the date of shipment by PTI. In case of systems that include installation by PTI, the warranty will start from the date of installation or thirty (30) days after the shipping date, whichever is earlier.

This warranty is in lieu of all other warranties, expressed or implied, including, without limitation, the implied warranties of merchantability and fitness for a particular purpose, nor will PTI provide training on its use free of charge. PTI shall not be responsible for any liability, loss or damages, caused or alleged to be caused, by the system, as a result of use or operation including, without limitation, consequential damages and loss of profit.

Specific Exclusions and Limitations

1. It is recognized that the performance of consumable items will diminish as a function of use, and that it may be necessary to replace such items to restore the stated specifications. Consumable items (arc lamps, filters, cuvettes, lenses, etc.) are not covered by the warranty.
2. The original manufacturer's warranty will be maintained for major system components not manufactured by PTI (e.g. computers, printers, microscopes, cameras and components thereof).
3. Fiber optic bundles are not covered by the warranty.
4. The use of arc lamps not supplied by PTI (or approved in writing by PTI) will void PTI's warranty on all illuminator subsystem components.
5. If there is any evidence of physical contact with coated optics (e.g. fingerprints), the warranty on that item will be voided.
6. If the optical components are realigned by the customer without specific permission from PTI, the warranty will be voided. Please note that the customer is responsible for changing lamps and aligning the lamp after installation. Aligning the lamp will not void the warranty unless other exclusions are applicable (nos. 4 and 5).
7. Instrument systems that are not authorized to be installed by anyone other than PTI service personnel will not be warranted.
8. In case of systems that include installation as part of the original purchase, unpacking the instrument by anyone other than PTI personnel will void the warranty.
9. Moving systems to another site within a facility or to another location, without specific permission from PTI, will void the warranty.
10. Damage or loss caused by shipping is not covered by the warranty.
11. Damage caused by improper operation of the instrument will void the warranty.
12. Damage caused by equipment not purchased from PTI that is attached to the instrument is not covered by the warranty.
13. Warranty is valid only in the state, province or country of the original purchase.
14. Warranty is valid only on systems having a computer supplied by PTI.
15. Software upgrades performed on the PTI computer workstation (e.g., adding word processors, image editors, etc.) not authorized by PTI will void the warranty.
16. Hardware upgrades performed on the PTI computer workstation (e.g., adding network boards, sound cards, etc.) not authorized by PTI will void the warranty.

Warranty Returns

A Return Material Authorization (RMA) Number must be obtained from the PTI Service Department before any items can be shipped to the factory. Returned goods will not be accepted without an RMA Number. Customer will bear all shipping charges for warranty repairs. All goods returned to the factory for warranty repair should be properly packed to avoid damage and clearly marked with the RMA Number.

Warranty Repairs

Warranty repairs will be done either at the customer's site or at the PTI plant, at our option. All service rendered by PTI will be performed in a professional manner by qualified personnel.

Software

PTI makes no warranties regarding either the satisfactory performance of the software or the fitness of the software for any specific purpose. PTI shall not be responsible for any liability, loss or damages caused or alleged to be caused by our software as a result of its use, including, without limitation, consequential damages and loss of profit, nor will PTI provide training on its use free of charge.

Safety Symbols Used In This Manual

(NOTE: Not all may be present in this manual)



(DANGER)

This symbol indicates the potential for serious bodily harm. Extreme care should be taken when performing the task and all warnings should be strictly adhered to. All possible steps should be taken to ensure safety.



(WARNING)

This symbol represents the potential for electrical shock and/or other bodily harm. Care should be taken when performing the task. There is also the potential for damage to equipment if warnings are not taken seriously.



(CAUTION)

This symbol represents the potential for equipment damage. The user is expected to use care when performing the task.



(RADIATION)

This symbol represents the risk of UV radiation. User must take all appropriate steps to protect eyes and exposed areas of the skin.

Main Safety Precautions

UV PRECAUTIONS

- Never look directly at an operating lamp; severe eye injury will result. Wear UV protective lenses, such as a welder's helmet, when working around operating lamps. Care should also be taken to ensure that exposed areas of the skin are protected.

HANDLING OF LAMPS

- Compact arc lamps contain a highly pressurized gas, and present an explosion hazard *even when cold*. Wear face protection, such as a welder's helmet, whenever handling lamps.
- Some lamps can only be mounted one way in the lamp housing since the anode (+) and cathode (-) have different diameters. However, some lamps have the same diameter anode and cathode that could lead to an orientation error. **OBSERVE POLARITY!**
- The anode adapter should not put any mechanical stress on the lamp. It may be necessary to bend the electrical wire connected to the adapter slightly in order to relieve any stress on the lamp.
- Never touch the quartz envelope with bare hands; such handling may lead to deterioration and premature failure of the arc lamp, and consequentially, a potential for the lamp to explode. Soft cotton gloves should be worn when removing and installing lamps.
- For 150 watt lamps, failure to check for leaks could result in flooding of the lamp housing, and presents explosion and electrocution hazards.
- Failure to maintain proper cooling may result in lamp damage and possibly lamp explosion.
- Pressurized lamps operate at **VERY HIGH TEMPERATURES** and therefore care must be taken when handling the lamps.

IGNITER PRECAUTIONS

- The igniter produces very high voltage levels that can be fatal. **EXTREME CARE** should be taken when operating the igniter.
- Never operate an igniter without a lamp attached. Otherwise the voltage rises to a lethal level, and may cause damage to the igniter and power supply.
- Do not open the power supply or igniter cases. High voltage is present, and there are no user-serviceable parts inside.
- It is strongly recommended that the lamp power supply be connected to an isolated line supply to minimize electrical interference with other devices such as computers, photomultiplier detectors, etc. Also, physically position the power supply and igniter as far away as possible from computers, signal cables and other electrically sensitive items.

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1 Description

1.1 Introduction



When operating an arc lamp, the LPS-250B may only be used in conjunction with an LPS-221B Igniter that mounts on top of the Arc Lamp Housing.

Do NOT use this this Lamp Power Supply with a PTI model LPS-221 Igniter (connected to the Arc Lamp Housing by two cables). Attempting to interchange components of different versions (unless specified by qualified PTI personnel) WILL result in permanent damage to the equipment and WILL void the warranty.

The PTI LPS-250B is a highly-regulated DC power supply that provides very stable power for Xenon and Mercury-Xenon compact arc lamps from 100 to 200 watts. An external lamp igniter is provided for arc lamps.

When the power supply is initially turned on and before the lamp is ignited, approximately +100 volts appears across the output terminals. Pressing the IGNITE button applies +800 volts to the igniter, which triggers the igniter to send a 30 KV pulse to the lamp, thereby creating an arc between the lamp's electrodes.

The output current is set using the CURRENT control. The output voltage is automatically adjusted to maintain the desired current. Since the current is very accurately regulated, the resulting lamp power is highly stable for Xenon lamps, following a five-minute warm-up period. The warm-up period for Mercury-Xenon lamps is up to fifteen minutes. A digital meter displays lamp volts, watts or amps according to the setting of the DISPLAY selector.

The unit is air cooled with an internal fan that vents through the heat sink on the rear panel. Proper ventilation is required for reliable operation; the unit should not be placed directly against a wall or another device.

1.2 Specifications

Electrical:

Input (user selectable):	105-132 V/60 Hz or 210-264 V/50 Hz
Power Rating:	100 to 200 W
Operating Voltage:	up to approximately 35 V
Operating Current:	0 to 10 A
Pre-Ignition Voltage:	> 85 V
Ripple at Maximum Current:	< 10 mV
Stability After Warm-up:	0.2 %
Line Voltage Regulation:	0.1 % Current Variation for 5 volts Line Change
Load Regulation:	0.1 % Current Variation for 50 % Change in Load Impedance

Fuses

Line (Mains) Fuse (105-132 V):	5 Amp, 250 V slow blow
Line (Mains) Fuse (210-264 V):	2.5 Amp, 250 V slow blow
Overload protection fuse:	10 Amp, 250 V fast blow

Physical:

Dimensions:	4.5 H x 10.75 W x 14 D inches 115 H x 273 W x 356 D mm
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Add a minimum of 2 inches (50 mm) at the back when attaching the igniter cable and power (mains) cord.

Weight:	14 pounds 6.4 kg
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Do not open the power supply or igniter cases. High voltage is present, and there are no user-serviceable parts inside.

2 Installation

2.1 Arc Lamps

1. Connect the lamp power supply to the igniter using the gray igniter cable supplied. Verify the proper polarity of the connector by looking at the connectors at each end of the cable and the mating connectors on the components. The male end of the cable must plug into the female connector on the back of the lamp power supply. The female end of the cable must plug into the male connector on the igniter.



Failure to observe correct polarities will result in immediate and permanent damage to the lamp, and may cause the lamp to explode, resulting in damage to the lamp housing and power supply.

2. Verify the proper fuse selection for the lamp power supply. The fuse selection is determined by the small circuit card located in the Line (Mains) Module on the rear of the lamp power supply (see [Replacing The Fuses](#)).
3. With the proper fuse and circuit card selection in place, plug the Line (Mains) cord supplied from the lamp power supply into the appropriate Line (Mains) outlet.



Never operate an igniter without a lamp attached. Otherwise the voltage rises to a lethal level, and may cause damage to the igniter and power supply.

3 Operation

3.1 Arc Lamps

1. Set the DISPLAY selector to WATTS.
2. Set the Current control switch to the approximate normal setting for the lamp in use. Initially the Current Control switch can be set to the 2 o'clock position.
3. Turn on the lamp power supply by pressing the button labeled POWER.
4. Press and hold the IGNITE button until the lamp ignites, then release button.
5. After the lamp is ignited, and the warm-up cycle is completed (5 minutes for Xenon lamps and 15 minutes for Mercury-Xenon lamps) set the DISPLAY selector to WATTS and adjust the CURRENT control as necessary to provide the lamp with its rated wattage (see Table 1 - Lamp Specifications).
6. The lamp is extinguished by turning the power supply off.



The LPS-250B is equipped with an internal current limiting circuit to protect the drive transistors during the warm-up cycle of Mercury-Xenon arc lamps. The front panel current control cannot be used to alter the current during the warm-up cycle. Do not attempt to raise the current during the warm-up cycle, as damage to the transistors may result when the cycle has ended.

NOTE:

As the lamp becomes less efficient due to age and wear, the current setting must be periodically increased to compensate and maintain the desired power level (wattage). Xenon lamps with greater than 800 hours usage, or Mercury-Xenon lamps with greater than 600 hours usage, or any lamp which requires a voltage setting higher than the maximum specified in the following table should be replaced. The voltage setting can be checked by switching the Display Selector to VOLTS while the lamp is ignited.

Lamp Type and Rated Wattage	Nominal Operating Voltage	Maximum Operating Voltage
150 W Xenon	17.5 – 20 volts	20.5 volts
200 W Mercury-Xenon	22 – 24 volts	25 volts

Table 1 - Lamp Specifications

4 Service

4.1 Troubleshooting

4.1.1 If the lamp fails to ignite

1. **Turn off the power** switch on front panel.
2. Remove the lamp power supply AC cord from both the wall plug and the rear panel.
3. Check all electrical connections as specified in the *Installation* section.
4. Check the Line (Mains) Fuse for visual defects and/or test with an ohm meter. Replace as necessary (see [Replacing The Fuses](#))
5. Check the condition of the lamp and replace as necessary.
6. Reconnect the lamp power supply AC cord to both the wall plug and the rear panel.
7. Turn on power switch on front panel.
8. Check the volts/watts/amps settings as specified in the *Operation* section.
9. If the lamp still fails to ignite, call PTI for assistance.

4.1.2 If the front panel LCD display is blank while power is on

1. **Turn off the power** switch on front panel.
2. Remove the lamp power supply AC cord from both the wall plug and the rear panel.
3. Check the Overload Protection Fuse for visual defects and/or test with an ohm meter. Replace as necessary (see [Replacing The Fuses](#)).
4. Reconnect the lamp power supply AC cord to both the wall plug and the rear panel.
5. Turn on power switch on front panel.
6. If the LCD display remains blank, call PTI for assistance.



Do not open the power supply or igniter cases. High voltage is present, and there are no user-serviceable parts inside.

4.2 Replacing the fuses

4.2.1 Line (Mains) Fuse



Any fuse that fails repeatedly is potentially indicating a problem of a serious nature. In the event that a fuse fails upon, or shortly after replacement, contact PTI for assistance.

1. **Turn off the power** switch on front panel.
Remove the lamp power supply AC cord from both the wall plug and the rear panel.
2. Slide the plastic fuse cover to the left to expose the fuse and its removal lever.
3. Pull the lever labeled “FUSE PULL” outward and to the left and remove the fuse.
4. The fuse selection is determined by the small circuit card located under the fuse in the Line (Mains) Module on the rear of the lamp power supply. The current AC Voltage selection can be read on the top of the card while it is in place. If it is incorrect, use a pair of needle nose pliers to pull the card straight out and orient it so either 120 or 240 can be read when the card is in place (120 is for the range 105 – 132 VAC and 240 is for the range 210 – 264 VAC. The 110 or 220 V selections are not needed and are not wired).
5. Move the fuse lever back into place before replacing the fuse.
6. Replace with the appropriate fuse from the following table:

AC Voltage	Fuse Specification
105 - 132 VAC	3AB or 3AG, 5 Amp, 250 V slow blow
210 - 264 VAC	3AB or 3AG, 2.5 Amp, 250 V slow blow

Table 2 - LPS-250B Lamp Power Supply Line (Mains) Fuse

7. Slide the plastic fuse cover to the right and reconnect the AC cord.

4.2.2 Overload Protection Fuse

The fuse holder is labelled “FUSE: FAST BLOW 10 AMP”

1. **Turn off the power** switch on front panel.
Remove the lamp power supply AC cord from both the wall plug and the rear panel.
2. Gently push the black fuse holder in, while turning it counter-clockwise.
3. Remove the fuse.
4. Replace with a 10 A, fast blow, 250 V fuse.
5. Push the fuse holder in and rotate it clockwise until seated.
6. Reconnect the AC cord.

5 Service Calls to PTI

Before calling for service, please review the [Troubleshooting](#) section. To aid our Service Department in discussing your questions, as well as to aid in the timely solution of any problems, please assemble as much as possible of the following information before calling PTI:

- Your system serial number, or as many other component serial numbers as possible
- Your instrument type and hardware configuration (and software version, if applicable)
- The date on which your instrument was installed
- As much detail as possible on the particular chain of events or circumstances that led to the problem. This information should include the complete instrument status and data gathering protocol.

Contact PTI Service at
Toll Free: 877-784-4349 US/Canada
Phone: 609 894-4420 Ext 115
Fax: 609 894-1579
Email: service@pti-nj.com

VISIT OUR WEBSITE AT
www.pti-nj.com