High-Power Xenon Light Source

HPX-2000

A  Product

Installation and Operation Manual

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WARNING

Protective Eye Wear Must Be Worn
When Using This Instrument -
Intense Ultraviolet Radiation Present

See Important Safety Notices inside.

A HALMA GROUP COMPANY

Ocean Optics offers the most comprehensive, innovative and high-quality line of modular spectroscopy tools in the world. Mikropack, a leading supplier of spectroscopy and thin film components, is an essential and valuable partner in this enterprise. We have partnered with Mikropack because they are committed to the same goals of innovation and quality that inspire us here at Ocean Optics. As always, Ocean Optics conducts its business in an open, honest and technically available fashion. We invite you to contact us at Ocean Optics, Inc. (see front cover for contact information) or Mikropack GmbH with any technical questions, comments, or applications inquiries. Mikropack GmbH can be contacted at the following location:

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Important Safety Notices

1. Do not remove or modify any installed safety device on this equipment. Doing so will void your warranty and create an unsafe operating environment.
2. Dangerous voltages are present in this device. There are NO user serviceable parts inside.
3. Only allow qualified personnel to service this unit.
4. Do not use the unit if it is damaged in any way. Contact your dealer for repair or replacement information.
5. Always screw in the fiber optic cables before starting the instrument.

WARNING

Protective eyewear **must** be worn when using this equipment. Intense ultraviolet radiation is present.
Never look directly into the light beam, as this can cause eye damage.

Warranty

Mikropack GmbH warrants to the original user of this instrument that it shall be free of any defects resulting from faulty manufacture of this instrument for a period of 12 months from the original data of shipment. There are no warranties for the Xenon Bulb (HPX-2000-B) and the Xenon-Bulb-Module (HPX-2000-BM).

This instrument should not be used for any Clinical or Diagnostic purposes. Data generated in these areas is not warranted in any way by Mikropack GmbH. Any defects covered by this Warranty shall be corrected either by repair or by replacement, as determined by Mikropack GmbH.

There are no warranties that extend beyond the description herein.

This Warranty is in lieu of, and excludes, any and all other warranties or representations expressed, implied, or statutory, including merchantability and fitness, as well as any and all other obligations or liabilities of Mikropack GmbH including, but not limited to, special or consequential damages. No person, firm, or corporation is authorized to assume for Mikropack GmbH. Any additional obligation or liability not expressed provided for herein except in writing duly executed by an officer of Mikropack GmbH:

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Table of Contents

About This Manual

Document Purpose and Intended Audience

This document provides you with an installation section to get your system up and running.

What's New in this Document

This version of the *High-Power Xenon Light Source Installation and Operation Manual* adds our partnership agreement.

Document Summary

Chapter	Description
Chapter 1: *Setup*	Contains a list of package contents and unpacking instructions. Also contains instructions for connecting the fiber optic cable.
Chapter 2: *HPX-2000 Specifications*	Contains operating environment specifications, as well as other physical details of the product, a parts list, and pinout information for the15 DB-15 connector.
Chapter 3: *Operating Instructions*	Provides instructions for operating the Xenon lamp and the TTL shutter.
Chapter 4: *Troubleshooting*	Contains a table of troubleshooting information.
Appendix A: *Bulb Replacement*	Provides instructions for changing the bulb.

Product-Related Documentation

You can access documentation for Ocean Optics products by visiting our website at **http://www.oceanoptics.com**. Select *Technical → Operating Instructions*, then choose the appropriate document from the available drop-down lists. Or, use the **Search by Model Number** field at the bottom of the web page.

You can also access operating instructions for Ocean Optics products on the *Software and Technical Resources* CD included with the system.

Engineering-level documentation is located on our website at *Technical → Engineering Docs.*

Upgrades

Occasionally, you may find that you need Ocean Optics to make a change or an upgrade to your system. To facilitate these changes, you must first contact Customer Support and obtain a Return Merchandise Authorization (RMA) number. Please contact Ocean Optics for specific instructions when returning a product.

Chapter 1

Setup

Overview

The following sections provide instructions on unpacking and setting up your HPX-2000 High-power Xenon Light Source.

Before using the HPX-2000 for the first time check for transport damage. Be sure to adhere to all warnings on the unit and in this manual.

HPX-2000 High-power Xenon Light Source

Unpacking the HPX-2000

► *Procedure*

1. Unpack your lamp assembly carefully. Although the lamp is rigidly mounted, dropping this instrument can cause permanent damage.

2. Inspect the outside of the instrument and make sure that there is no damage. Do not use the instrument if damage is present. Contact your dealer for repair or replacement information, if necessary.

3. Use this instrument in a clean laboratory environment (see *Operating Environment*).

Contents

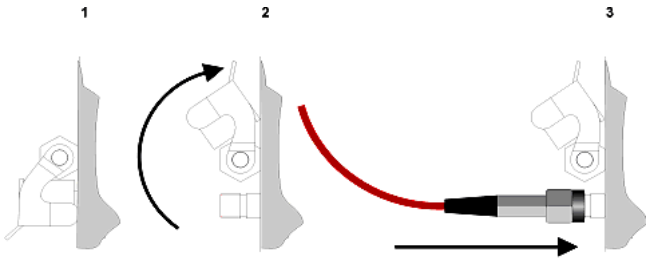
Your HPX-2000 package should contain the following:

- HPX-2000 High-power Xenon Light Source
- Power cord
- UV safety goggles
- One IC-DB15-2 interface cable for shutter operation

Connecting the Fiber Optic Cable

► *Procedure*

To connect the fiber optic cable to the HPX-2000,



1. Locate the cap on the front of the HPX-2000.

2. Lift the cap on the front of the HPX-2000 to expose the SMA connector.

3. Connect the fiber optic cable to the SMA connector.

Chapter 2

HPX-2000 Specifications

This section provides information on the operating environment, physical controls, and dimensions of the HPX-2000. It also provides pinout information for the connector.

Operating Environment

The following table provides information on optimizing the operating environment of your HPX-2000.

Operating Environment	The HPX-2000 Unit . . .
Moisture	Is designed for operation in dry rooms only.
Ventilation	Should be situated so that its location or position does not interfere with proper ventilation.
Heat	Should be situated away from any device that emits excessive heat.
Object and Liquid Entry	Should be positioned so that objects do not fall on top of the unit. Additionally, ensure that no liquids are spilled into the enclosure through openings.

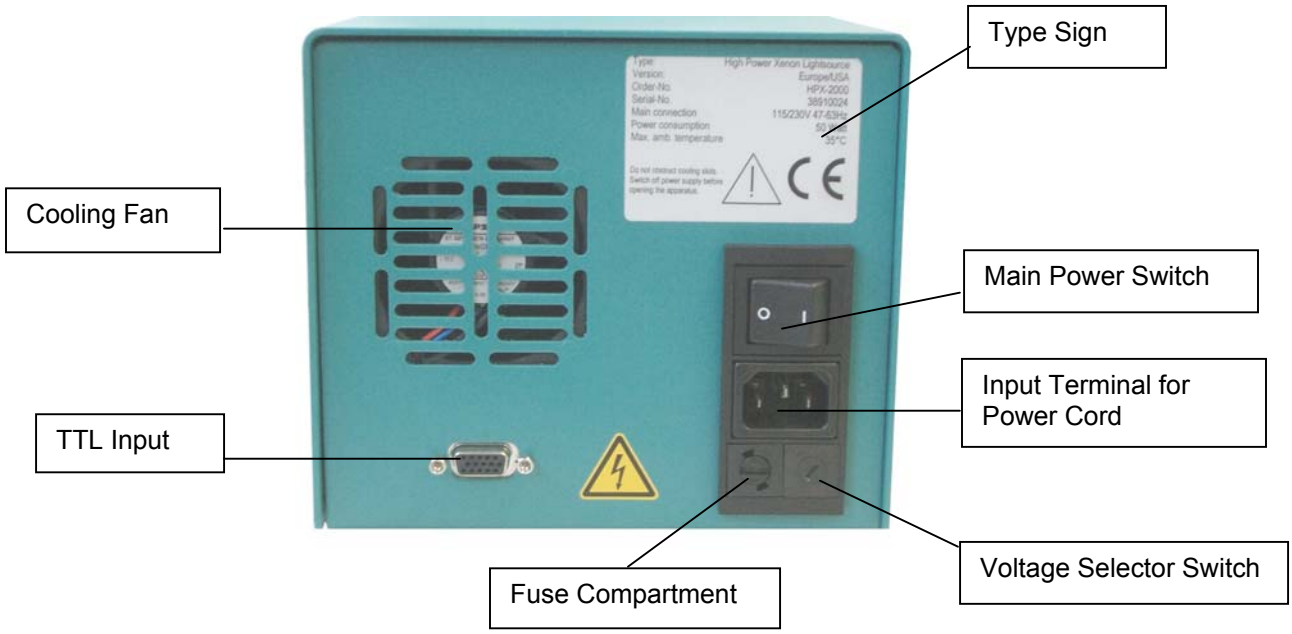
HPX-2000 Components

The following sections describe the components located on the front and rear of the HPX-2000 unit.

Front Panel

Component	Description
Filter Slit	Slit to accommodate optical filters.
Power LED	Displays state of main power to lamp.
Xenon ON/OFF	Press and hold the ON/OFF switch for more than 1 second to turn the lamp on or off.
Status LED	Status of the Xenon lamp: • Lit – Xenon lamp is on • Blinking – Lamp is in setup mode or cool down mode. The Lamp cannot be started when the Status LED is blinking. • Off – Xenon lamp is off
Shutter Switch	OPEN - Shutter open CLOSE - Shutter closed TTL - operation by external TTL- signal (HIGH=OPEN, LOW=CLOSE)
Mechanical Protection – SMA Connector	Covered to protect users from unintentionally looking directly at the beam of light. Used for SMA connections only. Connect the fiber cable to the HPX-2000 BEFORE turning the lamp on to avoid unnecessary exposure to UV radiation. Avoid direct contact with the fiber end. Always wear proper eye protection when using the HPX-2000 lamp.
Four Recessed Screws	Unscrew to remove the unit's housing. See *Bulb Replacement*.

Rear Panel



Component	Description
Voltage Selector Switch	Select regional voltage setting for lamp (AC 230-240V, 50/60Hz or AC 110-115V, 50/60Hz).
Main Power Switch	Turn on to supply power to the HPX-2000. The Power LED lights when this switch is in the On position.
Fuse Compartment	Contains the fuse to protect the unit against overload: Fuse Type: Miniature fuse 5 x 20 mm, 1 Amp slow blow
Input Terminal for Power Cord	Plug power cord into this terminal. **Note:** Only connect the power cable to the lamp when the Main Power Switch is in the OFF position.
TTL Input	SUB-D 15-pin connector for automatic shutter control.
Type Sign	Label providing lamp information: - Type: High Power Xenon Lightsource - Version: Europe / USA - Order-No.: HPX-2000 - Serial-No.: Xxxxxx - Mains connection: 115 / 230V 47-63Hz - Power consumption: 50 Watt - Max. Ambient Temperature: 35°C
Cooling Fan	Cools the interior of the HPX-2000. Do not obstruct.

Specifications

Specifications	Criteria
Spectral Range	185 – 2000nm
Light Output Stability	~ 1%
Warm-up time	25 - 40 minutes
Performance guaranteed temperature	5°C – 35°C
Humidity	5 - 95% without condensation at 40°C
Power Consumption	50W
Current	4 A/DC maximum
Optical Power in 600µ Fiber	> 150 mW
Time to stabilize	~ 30 minutes
Optical Fiber Connection	SMA (optional FC/PC; SC...)
Lifetime Average / Guaranteed	2000h / 1000h
Shutter-Input	TTL-Input, up to maximum 5 Hz
PIN position at SUB-D-15 pin	Shutter PIN 13: TTL / PIN 10: Ground
Filter Dimensions possible	Up to diameter or square 25mm x 4mm or 20 x 6 mm
Input Line	115 / 230VAC (switchable)
Markings, Directives	CE; VDI/VDE 0160; EN 61010
Input Current	3,5 A
Weight	5kg
Dimensions	150 x 170 x 260 mm

Parts List

Description	Part Number
High Power CW Xenon Lightsource with Shutter and Filter Holder	HPX-2000
Replacement Lightsource Module complete with bulb housing optics and shutter, for plug and play replacement on customer side	HPX-2000-BM
Trade in of used HPX-2000-BM for Xenon bulb exchange at the supplier side	HPX-2000-B

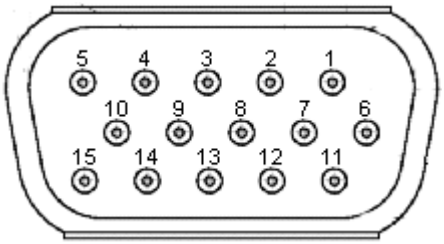
Modification of device specifications and designs to improve performance may occur without notice.

Pinout Information

The following table contains pinout information for the HPX-2000 Light Source:

Pin	Description
1	na
2	na
3	na
4	na
5	na
6	na
7	na
8	na
9	na
10	Ground
11	na
12	na
13	TTL Signal – Shutter control
14	na
15	na
na = not applicable	

Pinout Diagram



Chapter 3

Operating Instructions

Operating the Xenon Lamp

The following sections provide instructions on operating the Xenon lamp in the HPX-2000 Light Source. The HPX-2000 unit must be in a horizontal position for it to work.

Starting Main Power

► ***Procedure***

To apply main power to the unit,

1. Ensure that the proper voltage is set on the Voltage Selector Switch on the rear panel of the unit (see *Rear Panel*).

2. Ensure that the Main Power Switch is OFF. Then, connect the power cord to the Terminal Input on the rear panel of the unit.

3. Turn the Main Power Switch ON. The Power LED lights, indicating that the unit is receiving power.

Starting the Lamp

Hold the Xenon ON/OFF switch down for 1 full second to illuminate the HPX-2000 lamp.

The lamp cannot be started when the Status LED is blinking. The Status LED blinks for about 5 seconds after the main power is switched on (main power switch is located on rear of unit).

WARNING

Protective eyewear must be worn when using this equipment - Intense ultraviolet radiation present.

Never look directly into the light beam, as this can cause eye damage.

Turning the Lamp Off

Turn the Xenon lamp off by holding the Xenon ON/OFF switch down for one full second. The Status LED blinks for about 30 seconds while the lamp cools down.

Warming Up the Lamp

The HPX-2000 requires 25-30 minutes of operation to reach a state of thermal equilibrium. During this warm-up period, the intensity of the output power can vary substantially.

If applications require extreme intensity stability, the lamp should be warmed up for an additional 30-45 minutes. Once warmed up for this amount of time, the lamp will reach specified drift values.

Operating the TTL Shutter

Automatic Operation

For automatic operation, plug the SUB-D 15-pin TTL connector into the appropriate socket on your spectrometer.

Manual Operation

Manually set the operating mode of the HPX-2000 with the Shutter Switch as follows:

- OPEN - Shutter open
- CLOSE - Shutter closed
- TTL - Controlled over external TTL signal (HIGH=OPEN, LOW=CLOSE)

Operating the Filter Slit

► ***Procedure***

1. Rotate the light beam protection cap to open the filter slit (see *Front Panel*).
2. Insert your filter with a maximum size of 1” round or square into the filter slit.
3. Rotate the light beam protection cap to close the filter slit.

Chapter 4

Troubleshooting

If the power supply or lamp does not seem to functioning properly, check the following:

Issue	Probable Cause	Resolution
Power switches on, but no LEDs light.	Line power not present	Check line voltage
	Fuse defective	Check fuse
Xenon lamp does not start	Lifetime of the lamp is exhausted	Replace the lamp module
	Lamp's internal connection plug is not closed properly	Open unit (see *Bulb Replacement*) and close connector plug.

Appendix A

Bulb Replacement

To order replacement bulbs for the HPX-2000, order item number HPX-2000-BM.

Replacing the Bulb

WARNING

During operation, the lamp reaches a temperature of approximately 250°C. Before changing the lamp's bulb, please wait at least 20 minutes for cooling before touching the lamp module.

► *Procedure*

Follow the steps below to change the bulb in the HPX-2000:

1. Turn the Main Power Switch OFF.

Caution

Connection/disconnection of the power cord from the Xenon lamp MUST only be done when the Main Power Switch is turned OFF. Because the output of the power supply is not galvanically separated from the line voltage, the connecting lead for the Xenon lamp can carry a voltage >42 V when the Main Power Switch is turned ON.

2. Disconnect the power cord from the unit.
3. Rotate the cap (Figure 2, #3) until the round hole is at the bottom and a screw (Figure 1, #2) becomes visible.
4. Remove the screw using the 1.5 mm Allen wrench included with the replacement bulb.

5. Remove the cap (Figure 2, #3) and the beam cover (Figure 2, #4) from the HPX-2000.

6. Remove the four recessed screws (Figure 1, #1), both front and back on both sides of the HPX-2000.

7. Remove the cover housing of the HPX-2000.

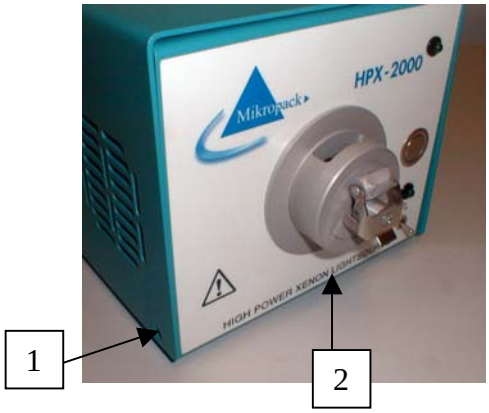


Figure 1

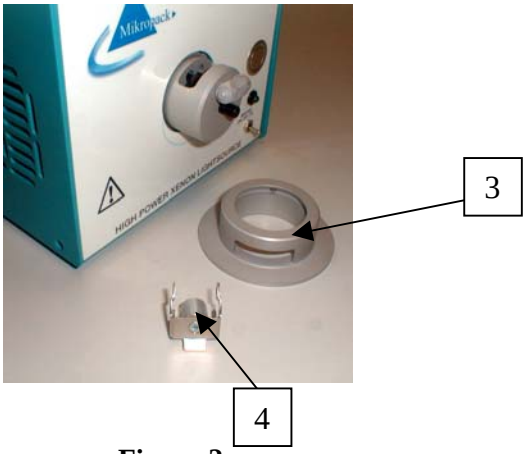


Figure 2

8. Loosen the screws (Figure 3, #5) by hand, disconnect the plug (Figure 3, #6), and remove the old bulb from the HPX-2000.

9. Place the new HPX-2000-BM bulb inside the housing, connect the plug, and replace the screws.

10. Close the housing and screw the 4 screws (Figure 1, #1) into the sides of the housing.

11. Replace the cap (Figure 2, # 3) and the beam-cover (Figure 2, #4).

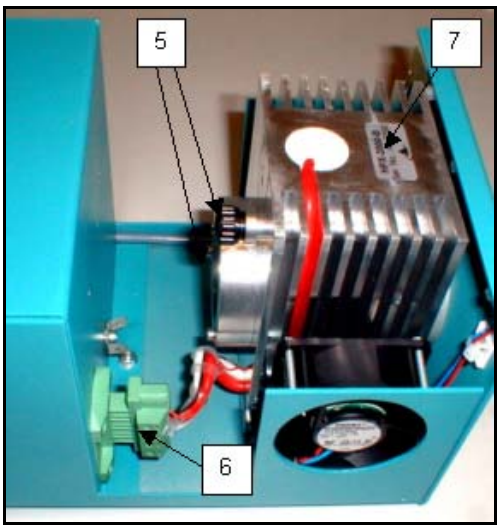


Figure 3

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