

# Instruction Manual

## UV Spot Light Source

### PHOTOCURE L8327



Those who are engaged in operation and maintenance of this equipment should read this instruction manual thoroughly before initiating operation or maintenance.

Do not operate the equipment or perform maintenance unless this manual has been fully understood.

Operating the equipment in any way other than described in this manual may result in a serious accident.

The operator or person responsible for the equipment must not let anyone operate the equipment who does not have full understanding of the equipment.

Keep this manual readily accessible so that it can be consulted at any time.

Should this manual be lost or ruined, order it from us directly or from our sales office.

When transferring this equipment to another owner, be sure to attach this manual to the equipment.

# **HAMAMATSU**

# Safety Precautions

Make sure to read these “Safety Precautions” carefully before starting to use the equipment and observe them during operation.

## 1-1. Classification of Warning Instructions

Warning instructions in this manual and on labels are classified as described below. As each word and symbol carry special meanings, familiarize yourself with them and observe the instructions.



### DANGER

This means that there is a high risk of death or serious injury to the operator if these instructions are ignored or the equipment handled incorrectly.



### WARNING

This means that possible death or serious injury to the operator may result if these instructions are ignored and the equipment handled incorrectly.



### CAUTION

This means that injury to the operator and damage to the equipment may result if these instructions are ignored or the equipment handled incorrectly.



This symbol means that the instruction describes the special care required when handling the product.  
Read it carefully and use the product safely.



This symbol means that the instruction describes prohibited item or action.  
Read it carefully and never attempt a prohibited action.



This symbol means that the instruction describes an action that must be performed.

Read it carefully and be sure to perform as instructed.

### Note

This symbol means there is an advice about the operation.

## Safety Precautions

### 1-2. Safety Instructions



#### DANGER

#### ● Light

This equipment emits very strong ultraviolet light which is harmful to eyes and the skin.

Also, as the light emanating from the light guide connection aperture contains infrared light in addition to ultraviolet light, its irradiation will cause heat generation.

Be sure to observe following instructions for operation of the equipment.



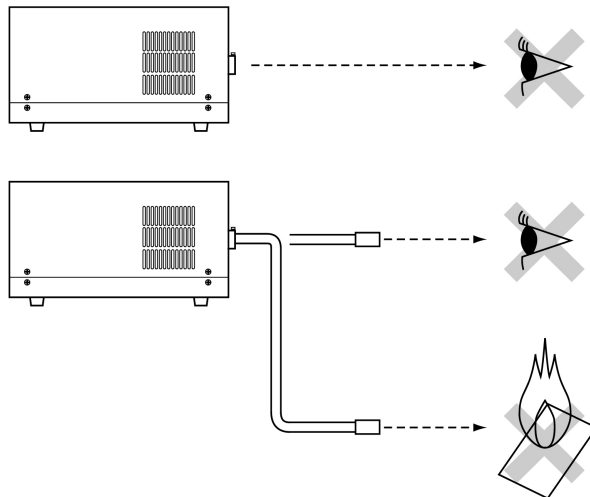
**DO NOT** look directly into the light guide connection aperture or at the light emanating from the light guide. Strong ultraviolet light can cause blindness.



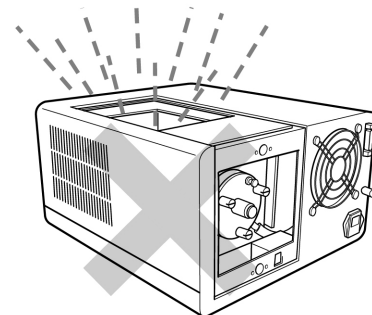
**DO NOT** allow light to come into contact with skin. Contact with skin may cause sunburn-grade inflammation. Always wear safety glasses, gloves, and other appropriate protective gear when operating this equipment.



**DO NOT** allow light from the light guide to radiate onto flammable material.



The unit includes an interlock that prevents the lamp from lighting while the lamp cover is open. **DO NOT** attempt to override the lock function by manually depressing the switch, as this may result in uncontrolled release of dangerous ultraviolet light.



## Safety Precautions



### WARNING

#### ● Lamp Replacement



Be sure to disconnect the Power Supply Cord from the AC outlet before replacing the lamp. Attempt to replace it with the Power Supply Cord connected will cause an electric shock.



The inside of the lamp housing becomes extremely hot during lamp operation. Before replacing the lamp, switch it off and run the cooling fan for at least 5 minutes.



When replacing the lamp, connect to each terminal securely. Poor connection may result in unstable lamp irradiation output level and failure in lighting.



Always exercise due caution when handling or replacing a lamp. A lamp contains high-pressure gas (approximately 10 atmospheres at room temperature, approximately 40 atmospheres during operation) and may burst if dropped or otherwise impacted.

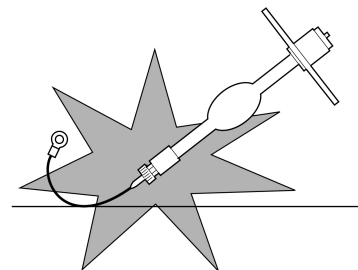
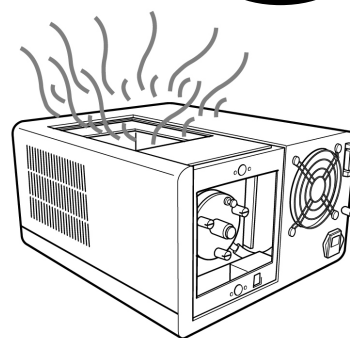


Replace the lamp within 3000 hours. The average service life of the lamp is 3000 hours. Lamps may burst if used for longer than 3000 hours.



DO NOT touch with bare hands or damage the quartz glass section of the lamps or the surface of the ellipsoid reflecting mirror. The surface is provided with a special coating. If lamps are used with dust or finger marks on its surface, such foreign substance may burn and devitrification may occur. Then, irradiation output strength and mechanical strength of the glass may be reduced and the lamps may burst.

**HOT!!**



**After the lamp has been replaced, please send the old lamp to the nearby sales office, or to have it disposed by the waste disposal specialist that has a mercury disposal facility.**

The lamp contains high-pressure gas, as well as mercury. Disposing of it together with ordinary garbage is extremely dangerous. Always make sure the lamp is disposed of properly.

When sending a lamp, put it in the lamp package box used for the new lamp to avoid any possible accident during transportation and address it to the nearby sales office. (Refer to page 35 for addresses.)

## Safety Precautions

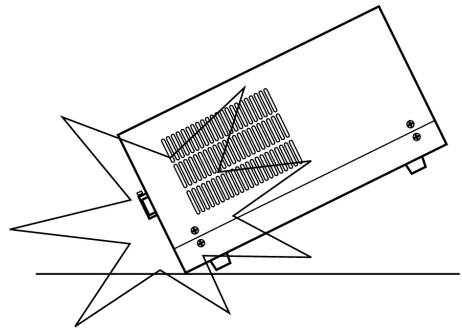


### WARNING

#### ● Vibration and Impacts



Handle the unit with care. Sharp impact or strong vibration can break the lamp or other fragile components, or disrupt the precise adjustment of internal mechanisms.



#### ● Removal of Covers



DO NOT remove the lamp cover unless absolutely necessary. Also, do not remove the top cover or under cover and never touch any of the screws or other components inside the equipment. The internal components of this equipment have been precisely adjusted. Changing the adjustments or renovating the equipment can cause problems with the unit, and can cause fire and electrical shock.

#### ● Abnormal Condition



Should an abnormal condition be found such as smoking, abnormal smell or noise, turn off the power immediately and then disconnect the Power Supply Cord from the AC outlet.

Use of the equipment with any abnormal condition left as it is may cause a fire, electric shock and other troubles.



Be careful not to place heavy objects on the power supply cord or bend it excessively. Doing so can damage the cable and lead to fire or electric shock.

#### ● Power Connection



Make sure that the power voltage in use complies with specification.

Using the equipment at any other voltage may cause a fire, electric shock and other troubles.



Remove the power supply cord from the outlet when not using the equipment for long periods of time. Doing so can damage the cable and lead to fire or electric shock.



DO NOT touch the power supply cord by the wet hand. Doing so can lead to electric shock.



DO NOT put a foreign substance into an inside. If what is easy to burn, metal, water, etc. enter, it will become the cause of failure, or a fire and an electric shock.

## Safety Precautions

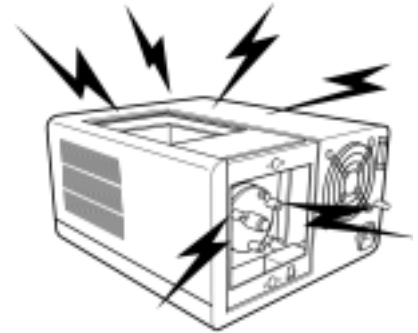


### WARNING

#### ● High-Voltage Trigger



The equipment's mercury-xenon lamp is started by a high-voltage (30 kV) pulse applied at the lamp electrodes. As protection against accidental electrical shock hazard, the design includes an interlock switch that disables lamp operation while the lamp cover is open. Never attempt to turn on the lamp by blocking the sensor window of the interlock switch.



### CAUTION

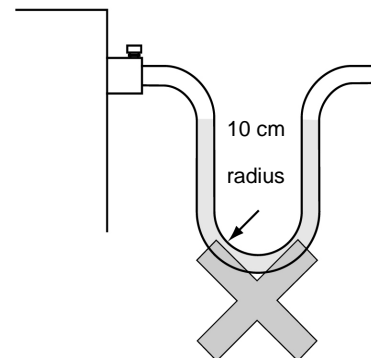
#### ● Light Guide



Handle light guides with care; light guides are delicate and may break if dropped or if bent to an excessive angle. Never bend to a radius of less than 10 cm (see illustration).



DO NOT touch the end of the light guide with bare hands. Dirt attached on it will reduce the amount of transmitted light.



#### ● Installation Position and Ventilation



Avoid a place with poor ventilation, high temperature and high humidity.

Do not install the equipment where the air from the cooling fan remains stagnant or the cooling fan and the air inlet port is blocked. For more information, refer to page 10.



DO NOT use the equipment in near with strong magnetism or strong electric wave.

Doing so can damage the equipment. It may incorrect-operate.



DO NOT use the equipment in the place which touches a place with vibration, and corrosive gas, and a dusty place.

Doing so can damage the equipment.



Ventilate the air in the room while the lamps are on.

Some lamps, depending on types, produce harmful ozone while they are on.



Install the main unit on its legs on a level surface.







Use of the equipment in an unstable place or unlevel condition may cause it to malfunction or to fall when an earthquake occurs or some impact is applied.



When you do not use it for a long time, please pull out a power supply plug from a wall socket for safety.

Note that this unit is classified as a product in IEC Standard Class (with a protective grounding terminal). In order that this equipment is used properly and safely, be sure to observe safely precautions described in the following pages. Use of this equipment in any way other than that described in this manual may hinder the protection function of this equipment. HAMAMATSU PHOTONICS shall not be liable for any faulty condition caused by such use against any of the said precautions.

**The symbol marks used for this equipment and their meanings are as follows.**

	"Handle with care". This symbol is found where Use's Manual or Service Manual Should be referred to in order to protect the operator and the equipment.		Alternative current
	Protective grounding terminal.		ON(Power supply)
	Functional grounding terminal. Do not use this terminal as the protective grounding terminal.		OFF(Power supply)



## Safety Precautions

### 1-3. Warning Label Attaching Positions

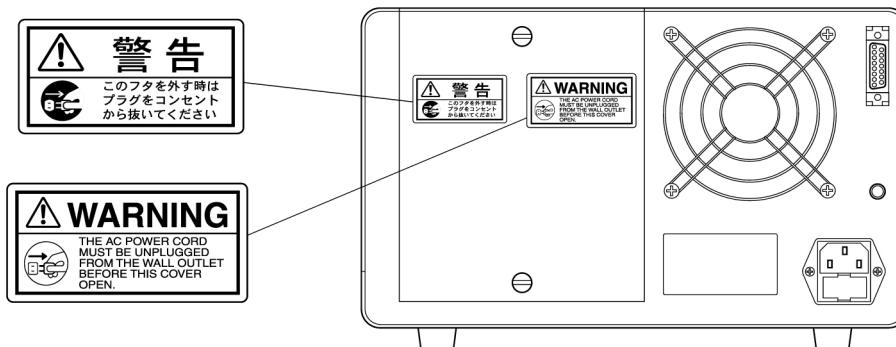


These labels must be attached so that they are clearly visible all the time.  
If they come off or become dirty, replace them with new ones.

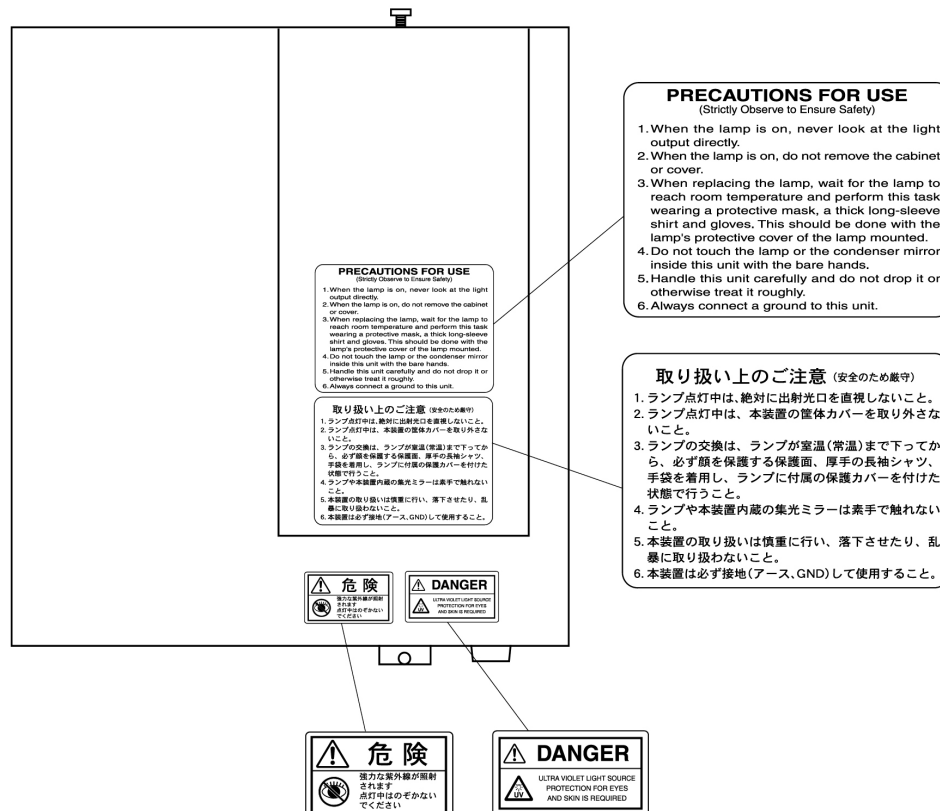
Warning labels are available (chargeable) from our sales office. (Refer to page 35.)

When it becomes necessary to replace any warning label, contact the nearby sales office.

#### ● Rear View



#### ● Top View



# Contents

<b>Safety Precautions</b> .....	1
1-1. Classification of warning instructions .....	1
1-2. Safety Instructions .....	2
1-3. Warning Label Attaching Positions .....	8
<b>Installation</b> .....	10
<b>Component Names</b> .....	11
<b>Replacing the Fuse</b> .....	13
<b>External Control Signals</b> .....	16
<b>Connecting the Light Guide</b> .....	18
<b>Power ON/OFF</b> .....	19
<b>Setting the Lamp Lifetime and Lamp Counter</b> .....	20
<b>Display Window and Indicator Lamps</b> .....	22
<b>Lamp ON/OFF</b> .....	24
<b>Shutter OPEN/CLOSE</b> .....	25
<b>Adjusting the Output Intensity</b> .....	27
<b>Replacing the Lamp</b> .....	28
<b>Filter Installation</b> .....	31
<b>Specifications</b> .....	32
<b>Troubleshooting</b> .....	33
<b>Warranty and After Service</b> .....	34

## Items included in the package

The PHOTOCURE L8327 product package includes following items.

Main unit .....	1 unit
Lamp .....	1 (installed in the main unit)
Power Supply Cord.....	1
External control signal I/O plug.....	1 (Not included in the package of the terminal block type model.)
Instruction Manual .....	1 copy (this booklet)

- Contents of this manual are subject to change without prior notice.
- Copying or quoting of this manual whether partially or as a whole is prohibited.
- If any of the following cases apply, please inform us so that we can take necessary measures quickly. (Please find our address and telephone number on page 35.)
  - Description in the manual is not clear, erroneous or missing
  - Pages are missing or not collated properly
  - The manual is lost, made dirty or damaged

# Installation



## CAUTION



Avoid locations with high ambient temperature or humidity.



Allow for adequate ventilation of fan exhaust.

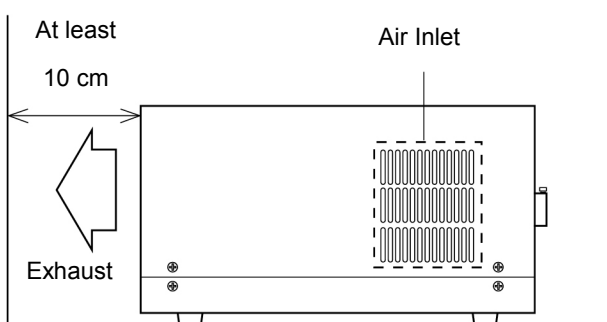


Some lamps, depending on types, produce ozone which smells while they are on. Install the unit properly so that the exhaust gas from the unit is evacuated and ventilate the room.

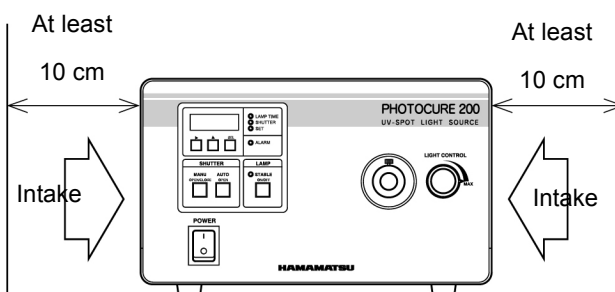


Set the unit horizontally on a level surface.

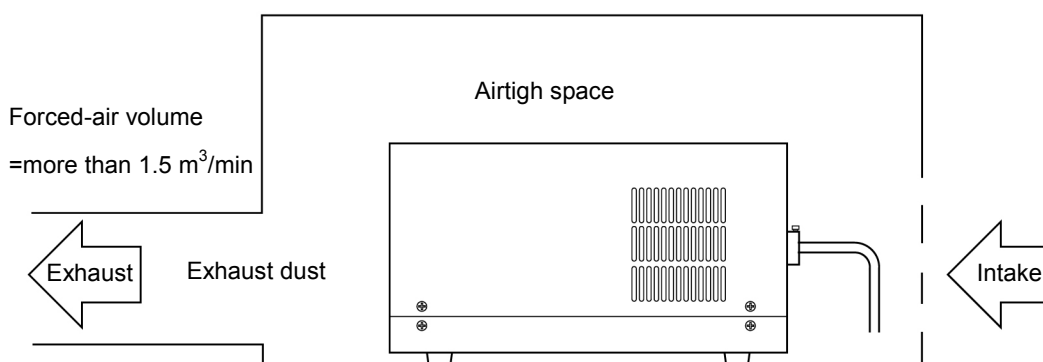
- The fan exhaust outlet at the rear of the unit must be at least 10 cm from the wall.



- The air inlets on the left and right sides of the unit must be at least 10 cm from the wall.

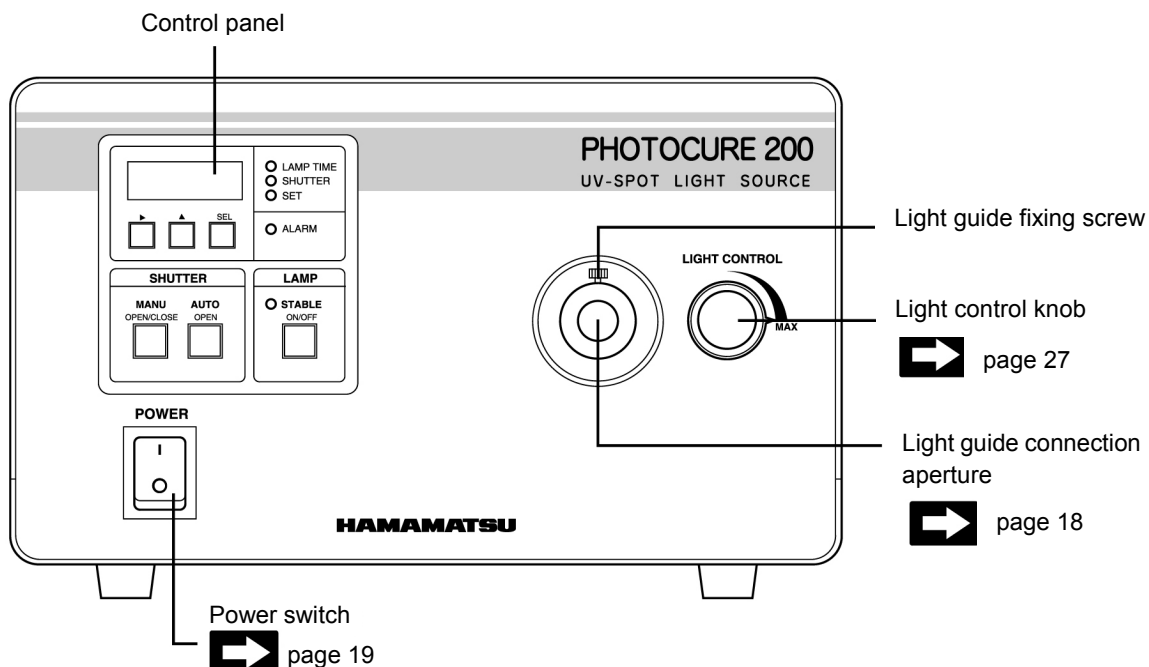


- If you install the unit in an airtight space, be sure to attach a separate exhaust duct and apply.

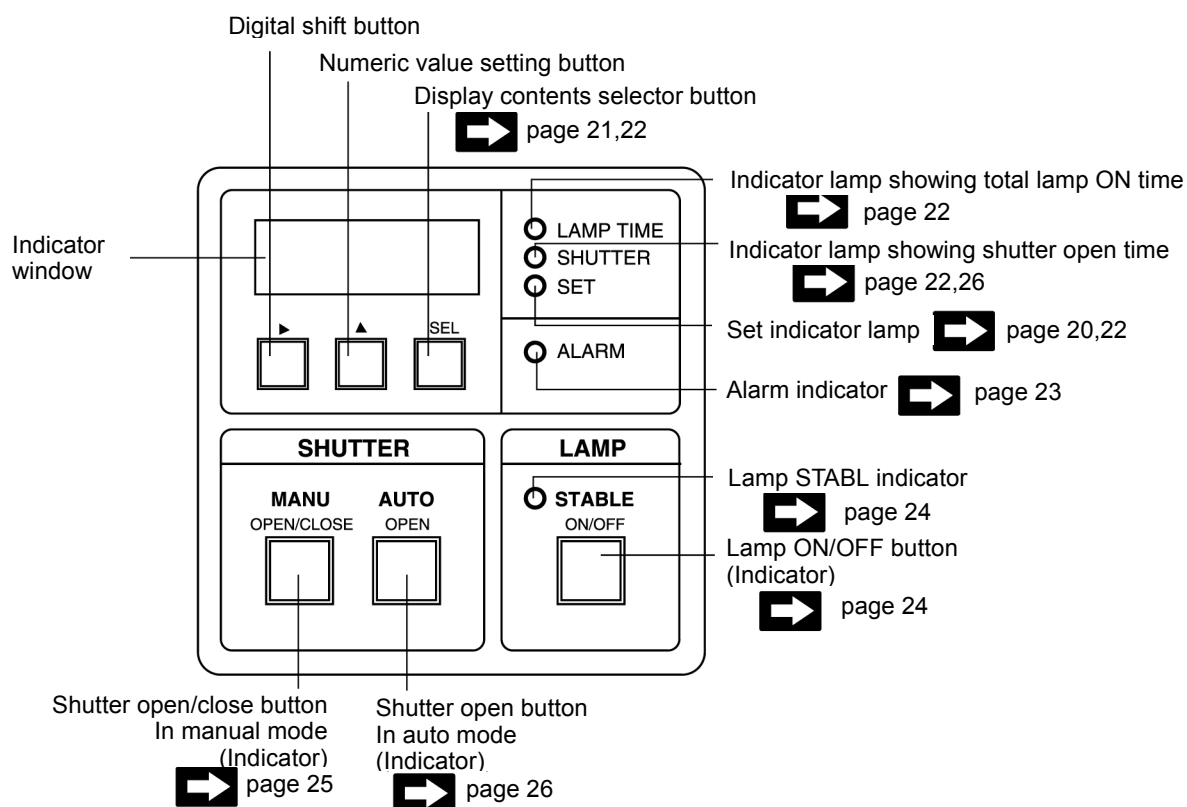


# Component Names

## ■ Front View

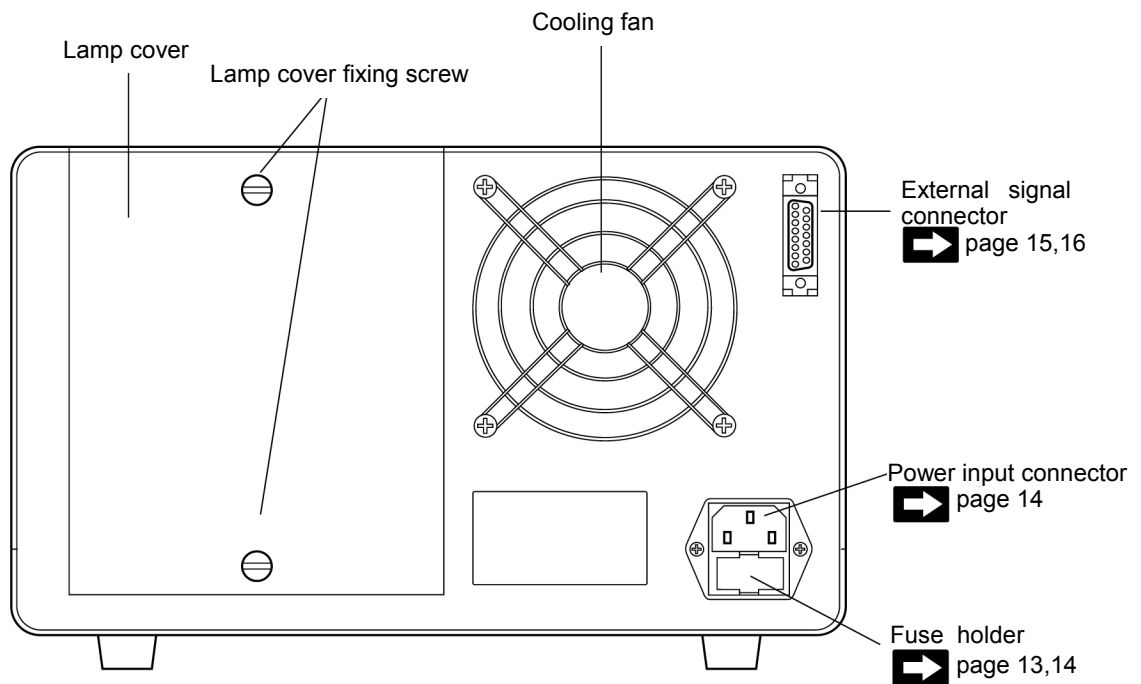


## ■ Control Panel

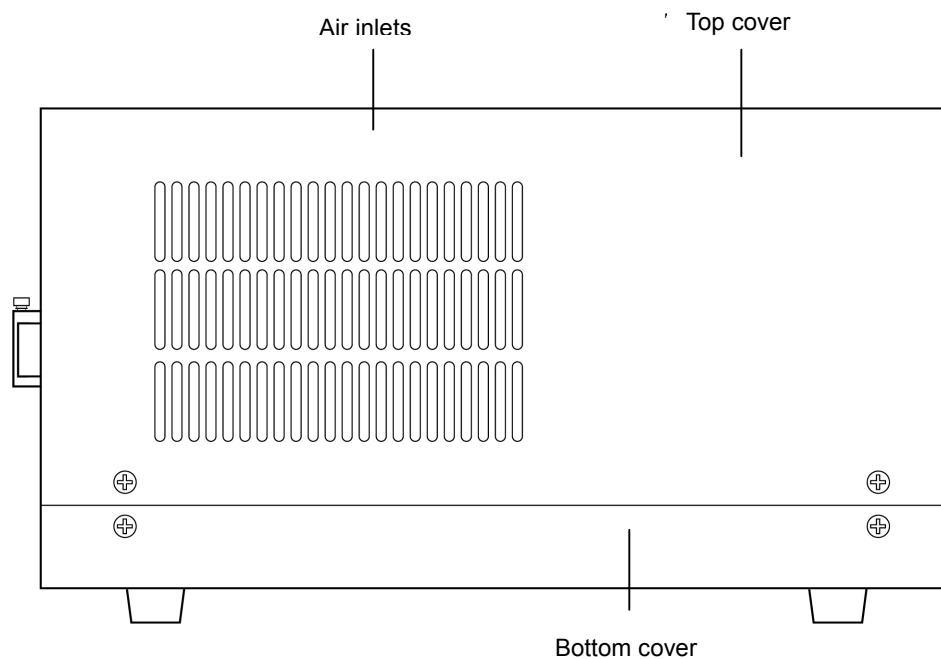


## Component Names

### ■ Rear View



### ■ Side View (Right)



## Replacing the Fuse



### CAUTION



Always turn off the power supply switch to the main unit before connecting the power supply.

### ■ Fuses

#### ● Rating of fuse

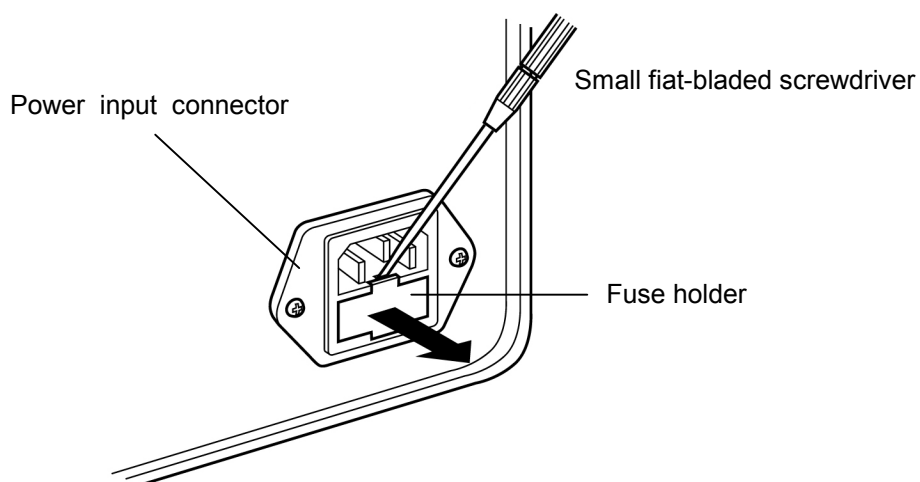
Rated voltage	Rated current	Current characteristic	Breaking capacity
250 V	5 A	Delay type (T)	Less capacity type (L)

#### ● Fuse replacement

The fuses are located inside the power input connector.

Unplug the Power Supply Cord from the power input connector.

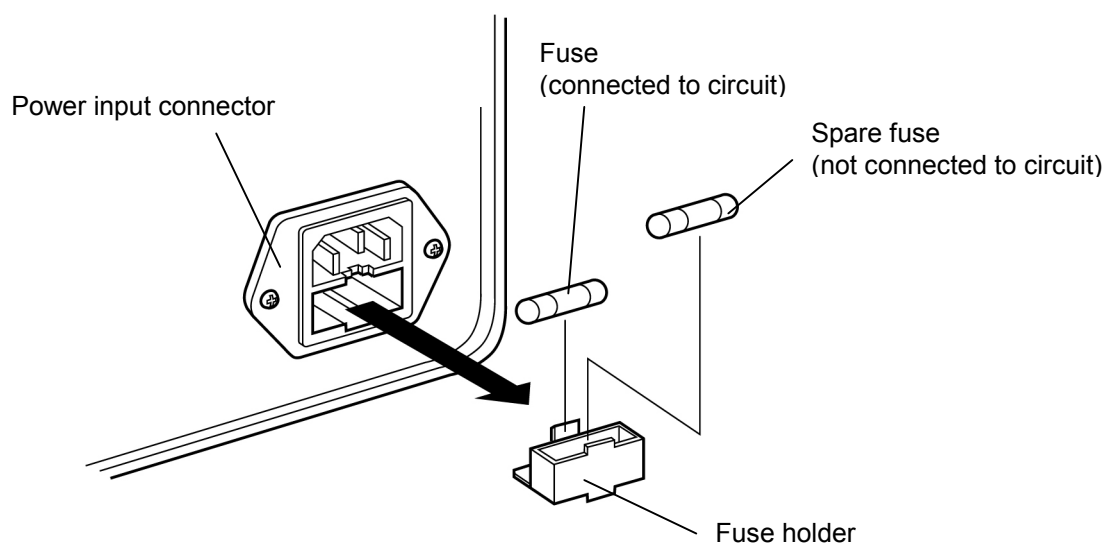
Using a tool such as a small flat-bladed screwdriver, pull the fuse holder forward.



## Replacing the Fuse

There are two fuses inside the holder. One is a spare fuse, and is not connected to the circuit.

When the fuse has blown and the spare fuse has been used, make sure a new spare fuse is provided.



**If the fuse blows again after replacement, it is suspected that there is some faulty condition. In such a case, stop using the equipment immediately and contact us.**

## Preparation prior to Operation

### ■ Connecting the Power Supply



**Always turn off the power supply switch to the main unit before connecting the power supply.**

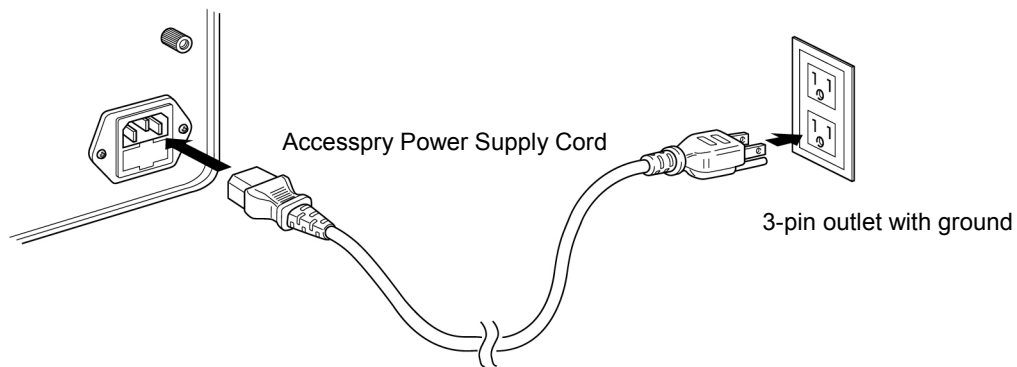


**Always make sure this unit has been grounded before using it.**

Use whichever of the following methods is appropriate for the rating of the outlet to which the unit is connected, and make sure the unit is securely grounded.

**For a 3-pin outlet with a ground**

Use the Power Supply Cord provided as an accessory, just as it is.

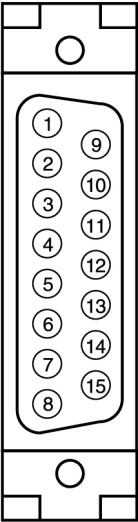




## External Control Signals

The shape of the terminal used for external control signals varies depending on models.

### ■ External Control Signals (15-pin D-sub type)

	Pin No.	Input Signal	
	1	+12 V	12 V DC output (current capacity: 100 mA max.)
	2	NC	
	3	Lamp ON	This is connected to the open collector of the photocoupler. It conducts to GND when the lamp lights. The LED can be lighted by using 12 V DC and attaching a resistor externally.
	4	Lamp STABLE	This is connected to the open collector of the photocoupler. It conducts to GND when the lamp is stable. The LED can be lighted by using 12 V DC and attaching a resistor externally.
	5	Shutter OPEN	This is connected to the open collector of the photocoupler. It conducts to GND when the shutter opens. The LED can be lighted by using 12 V DC and attaching a resistor externally.
	6	NC	
	7	ALARM	This is connected to the open collector of the photocoupler. It conducts to GND when the alarm LED on the front panel lights. The LED can be lighted by using 12 V DC and attaching a resistor externally.
	8	NC	
	9	NC	
	10	Lamp OFF trigger	The lamp goes out when this is connected to the GND terminal.
	11	Lamp ON trigger	The lamp lights when this is connected to the GND terminal.
	12	Auto shutter open input trigger	The shutter opens automatically when this is connected to the GND terminal.
	13	Shutter OPEN/CLOSE	The shutter opens when this is connected to the GND terminal. The shutter closes when this is released.
	14	NC	
	15	GND	GND terminal



#### CAUTION

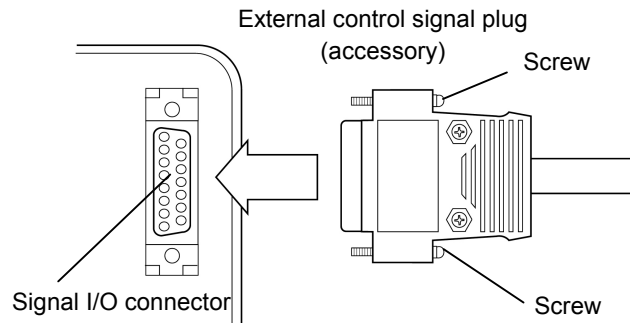


The current capacity of the pin at the +12 V output is 100 mA.  
Be careful not to connect an excessive load, or to short it to any of the other pins.

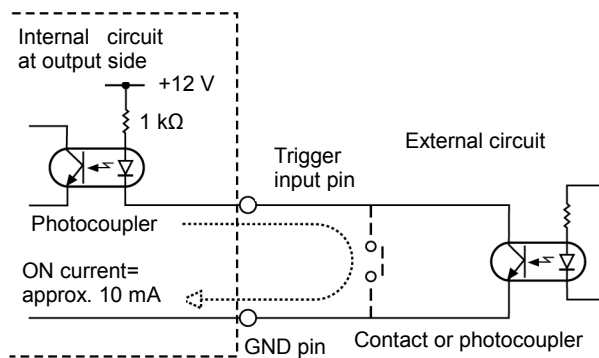
## External Control Signals

When performing external control by using the 15-pin D-sub type model, use the plug for external control signal supplied as an accessory.

Insert the plug into the signal I/O connector on the back of the main unit, and secure it with the upper and lower screws.



### ■ Signal Input



Each operation is possible by turning ON the circuit between the trigger input pin and the GND pin (see the table below).

#### • 15-pin D-sub type

Trigger input pin : to pin  
GND pin : pin

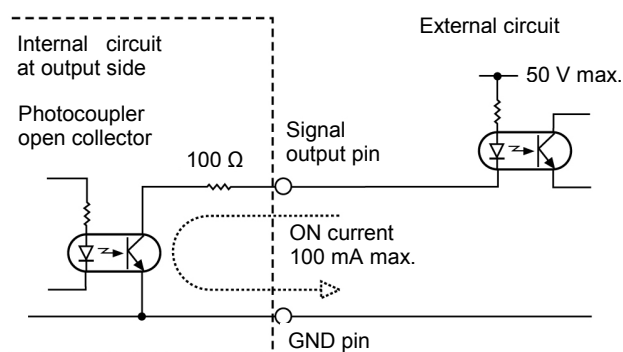
#### • Terminal block type

Trigger input pin : to pin  
GND pin : pin

The contact or transistor used to implement the short must be rated as follows.

- **Withstand voltage: DC 30 V minimum**
- **Current: DC 100 mA minimum**

### ■ Signal Output



The circuit between the signal output pin and the GND pin (see the table below) turns ON to output signals indicating each condition.

#### • 15-pin D-sub type

Trigger input pin : to pin  
GND pin : pin

#### • Terminal block type

Trigger input pin : to pin  
GND pin : pin

The load connected to the output must meet the following conditions.

- **Voltage: Maximum 50 V**
- **Current: Maximum 50 mA**



### CAUTION



A protective resistor (100 Ω) is included in the output transistor, but be careful not to supply current more than the rated current.

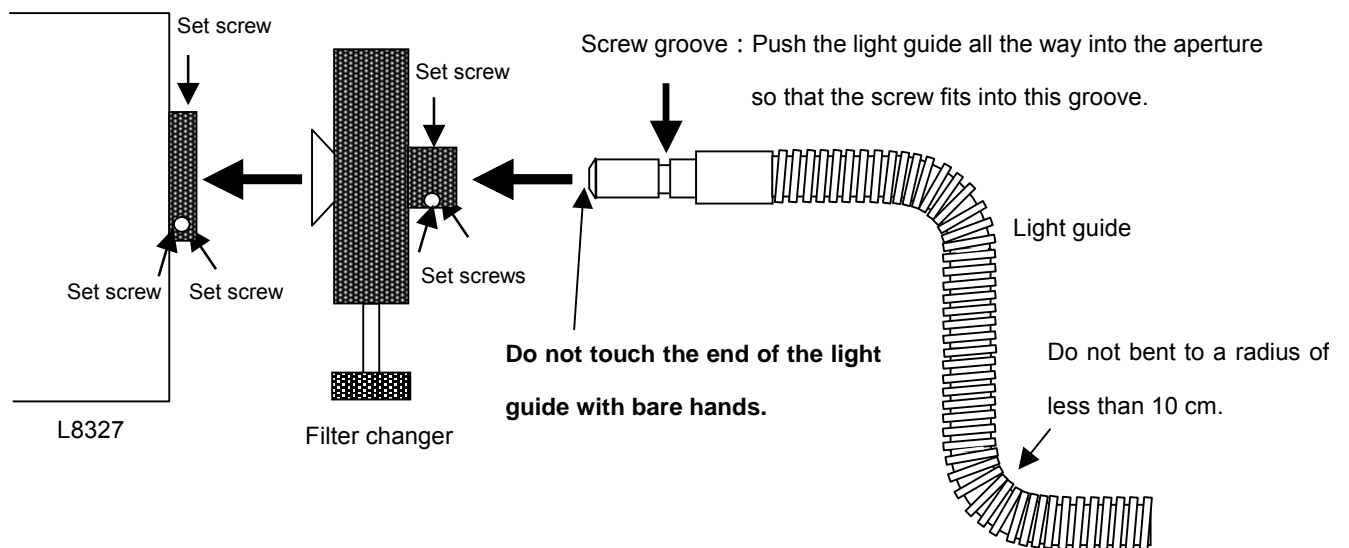
## Connecting the Light Guide

### ■ Connecting Procedure

The light guide is connected to the light source through the optical filter changer ,for example C8214 filter changer or manual filter changer.

Fixing the filter changer to the light source, then tighten the three set screws.

Insert the light guide to the filter changer, then tighten the three set screws.



#### CAUTION



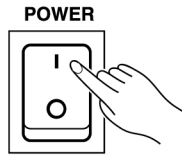
Do not touch the end of the light guide with bare hands.



Do not bend to a radius of less than 10 cm. Always handle light guides with care, as they are delicate and may break if dropped or if bent to an excessive angle.

## Power ON/OFF

### ■ Power On



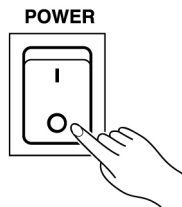
Pressing the upper side ( I ) of the power switch turns on the power supply. Immediately after the power supply has been turned on, the equipment is in initial setting status for about three seconds. During this time, all of the indicator lamps light, and operation button input and external control are inhibited. When the initial setting status has been completed, **the lamp goes out, and the shutter closes.** (Power On Reset function)



#### CAUTION

**After turning on the power, wait at least five seconds before initiating any operation such as lighting the lamp.**

### ■ Power Off



Do not switch power off immediately after using the lamp. Allow the fan to continue running for several minutes after the lamp goes off to ensure that the inside of the equipment is sufficiently cooled.

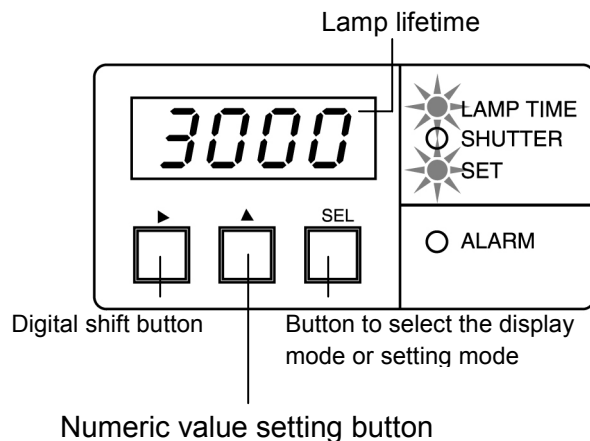
To set the power off, press the lower side ( O ) of the power switch.

## Setting the Lamp Lifetime and Lamp Counter

Once the lamp replacement time has been set, if the cumulative period of time that the lamp has been lighted reaches the set time, the "ALARM" indicator lights, indicating that the lamp should be replaced. At the same time, the "Alarm" signal is output from the external control I/O terminal.

### ■ Setting the Lamp Lifetime

When the unit is shipped from the factory, the lamp lifetime is set to 3,000 hours. To change the setting, follow the procedure outlined below.



Press the [SEL] button several times to get the Status both the "LAMP TIME" and "SET" indicator lamps are lighted.

Then the currently set lamp lifetime appears in the display window.

Press the [▶] button. The first digit begins blinking.

Press the [ ] button to set the digit's value.

The selection cycle is 0 1 . . . . 9 0 .

Press the [▶] button again.

The selected value is written to memory, and the next digit begins blinking.

Press the [ ] button to set the value.

Continue until all digits have been set, and no digit is blinking.

Press the [SEL] button three times, so that the "LAMP TIME" indicator lamp lights.

Perform Step above to check the lamp lifetime which has been set.



#### CAUTION



For the safety purpose, do not set the lamp lifetime for longer than 3000 hours. Lamps may burst if used for longer than 3000 hours.



If the [SEL] button is pressed in the process of setting (when one of the digits is blinking), that setting value will not be accepted.

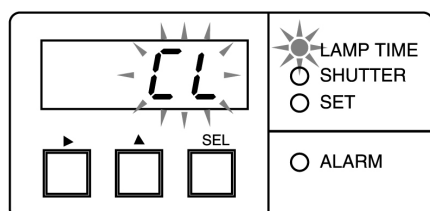


Leaving the lamp lifetime on the display for about 1 minute without pressing any button, the display changes to the lamp counter (operating time : home position) display.

## Setting the Lamp Lifetime and Lamp Counter

### ■ Resetting the Lamp Counter

Always reset the lamp counter when replacing the lamp.



Button to select the display mode or setting mode

Press the [SEL] button several times to get the status "CL" lights in the numeric value indicator window. At this point, the "LAMP TIME" indicator lamp lights, and "CL" in the window blinks.

Press both [▶] and [▲] buttons simultaneously, and the lamp counter will be set to "0000".



#### CAUTION



**Do not reset the counter if the lamp is not being replaced.**

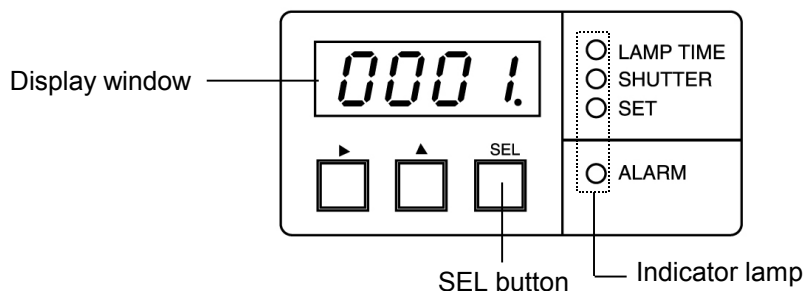


**Leaving "CL" on the display for about 1 minute without pressing any button, the display changes to the lamp counter (operating time : home position) display.**

# Display Window and Indicator Lamps

## ■ Switching the Display

Each time the [SEL] button is pressed, the contents of the display window change.

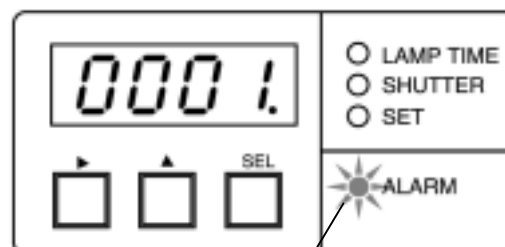


A Contents of display	Indicator lamp status
<b>Display of accumulative lamp lighting time (home position)</b> This display appears when the power is turned on. After the lamp has been replaced (the accumulative lighting time is reset), the amount of time that the lamp has been lighted is displayed.  Press [SEL] button once.	 Accumulative lamp lighting time
<b>Display of shutter open time</b> This displays the shutter open time, as set in . Pressing the [AUTO (OPEN)] button for the shutter displays a countdown of the remaining time that the shutter will be open.  Press [SEL] button once.	 Shutter open time
<b>Setting the lamp replacement time</b> This time is set to match the service life guaranteed for the lamp being used. For detailed information on the setting, please see page 20.  Press [SEL] button once.	 Lamp replacement time
<b>Setting the shutter open time</b> This sets the time interval from when the shutter opens until it closes (open time), when the shutter is used in the auto mode. For detailed information on the setting, please see page 26.  Press [SEL] button once.	 Shutter open time
<b>Resetting the accumulative time that the lamp has been lighted</b> When the lamp is replaced, this is reset to "0000". For instructions on resetting the display, please see page 21.  <b>Pressing the [SEL] button once returns to the " Display of cumulative lamp lighting time (home position)".</b>	

## Display Window and Indicator Lamps

### ■ Alarm Display Lamps

If a problem occurs with the equipment, the ALARM indicator lamp lights, and the nature of the problem is indicated in the display window. At the same time, the "ALARM Signal" of the external control signals goes on. If two or more troubles occur at the same time, they are displayed in the window by flashing codes alternately. If the "ALARM" indicator lamp has lighted, immediately check the cause of the problem and take corrective measures.



ALARM indicator lamp

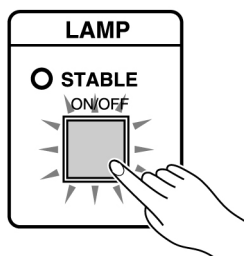
A Contents of display	Display	Correction
<b>● Shutter error</b> If the shutter does not open (or close) when the "Shutter Open" (or "Close") operation is carried out, the "ALARM" indicator lamp lights, and the "S.E" display flashes.		Replace the shutter unit.
<b>● Lamp lighting error</b> If the lamp does not light when it should, the "ALARM" indicator lamp lights, and the "L.E" display flashes.		Check to make sure the lamp has been connected correctly. If it still does not light, replace it with a new one. (See page 28.)
<b>● Overheating</b> If the temperature inside the equipment reaches 80 or higher, the "ALARM" indicator lamp lights, and the "O.H" display flashes. If the overheated status continues more than 5 minutes, the lamp is forcibly turned off.		Check for the following problems. <ul style="list-style-type: none"> <li>• Has the fan stopped?</li> <li>• Are the air inlets blocked?</li> <li>• Is temperature in the airtight enclosure rising due to insufficient exhaust?</li> </ul> <b>* When the temperature inside the unit drops, the alarm will be canceled.</b>
<b>● Lamp change</b> When the cumulative time which the lamp has been lighted reaches the specified lamp replacement time (see page 20,21), the "ALARM" indicator lamp lights, and the "L.C" and cumulative time display flash alternately.		The equipment can be used as usual, but the lamp should be replaced as quickly as possible with a new one. (See page 28.) After replacing the lamp, reset the cumulative lamp lighting time. (See page 21.)



## Lamp ON/OFF

The panel buttons (local operation) or external control signals (remote operation) can be used for operation.

### ■ Lamp on



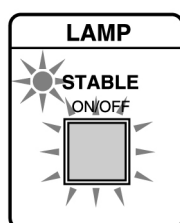
Control Panel (Local operation)	External Control Signal (Remote operation)
Pressing the [ON/OFF] button makes the lamp lighten. When the lamp lights, the indicator lamp goes on. Also, the point at the right end of the display window flashes, showing the accumulating sign of lamp operation time.	Shorting Pins to for an instant (approximately 0.5 seconds) lights the lamp. When the lamp goes on, Pin also outputs ON signal.



#### CAUTION

If the lamp fails to come on after inputting lamp-ON signal 3 times, abort the operation. Refer to the Troubleshooting section (page 33) for information about how to correct the problem.

### ■ Lamp-Stable Signal



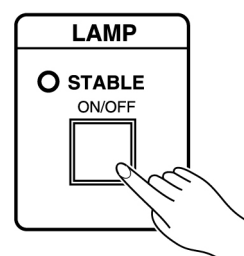
Control Panel (Local operation)	External Control Signal (Remote operation)
The "STABLE" indicator comes on about 7 minutes after the lamp lights up.	Pin outputs ON signal when the lamp stabilizes.



#### CAUTION

Initial lamp output is low and unstable.  
Do not use the lamp until the unit outputs the STABLE signal, indicating that lamp output has reached stability.

### ■ Lamp Off



Control Panel (Local operation)	External Control Signal (Remote operation)
Pressing the [ON/OFF] button of the lamp once while the lamp is lighted makes the indicator lamp to flash (for approximately 4 seconds). If a panel button is pressed while the indicator lamp is flashing, both the lamp and the indicator lamp go out. (The lamp does not go out unless the button is pressed twice in succession.)	Shorting Pins to for an instant (approximately 0.5 seconds) goes out the lamp. When the lamp goes out, Pin outputs OFF signal. Pin also outputs OFF signal at this time.

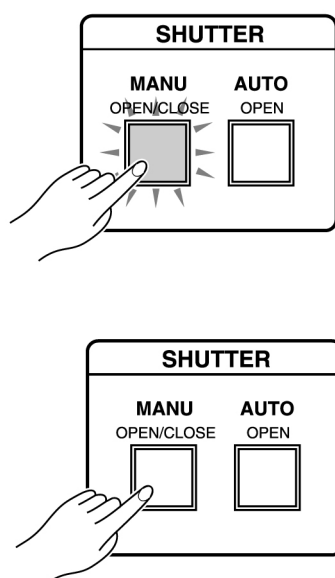
# Shutter OPEN/CLOSE

The shutter can be operated in two modes as described below.

- **Manual mode**..... The shutter is opened and closed using the ON/OFF [MANU] button.
- **Auto mode**..... The shutter is opened by turning the [AUTO] button on, and it closes automatically after a given period of time has elapsed.

In either mode, the panel buttons (local operation) or external control signals (remote operation) can be used for operation.

## ■ Opening and Closing the Shutter in Manual Mode



Control Panel (Local operation)	External Control Signal (Remote operation)
<b>Opening the shutter</b> Press the [OPEN/CLOSE] button under "MANU" once to open the shutter. When the shutter opens, the indicator lamp lights.	<b>Opening the shutter</b> The shutter opens when Pins    to    is shorted. When the shutter opens, Pin    outputs ON signal.
<b>Closing the shutter</b> When the shutter is open, pressing the [OPEN/CLOSE] button under "MANU" closes it. When the shutter closes, the indicator lamp goes out.	<b>Closing the shutter</b> The shutter closes when Pins    to    is open. When the shutter closes, Pin    outputs OFF signal. When the shutter is open, it can also be closed by pressing the [OPEN] button under "AUTO".

### Note

When the shutter is open, it can also be closed by pressing the [OPEN] button under "AUTO".

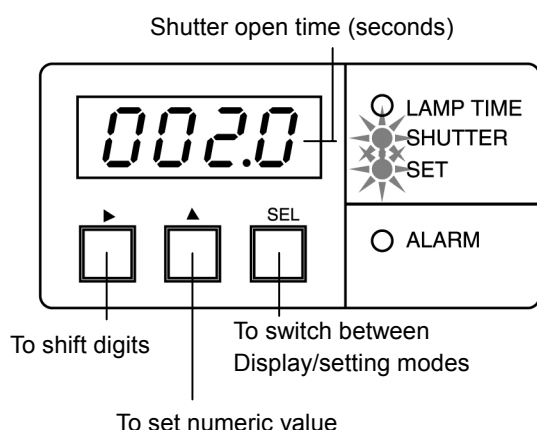
## Shutter OPEN/CLOSE

### ■ Opening and Closing the Shutter in Auto Mode

In Auto mode, the time that the shutter is to remain open must be specified in advance.

#### Setting the Shutter Open Time

When the equipment is shipped from the factory, this is set to 2 seconds. To change the set value, follow the procedure outlined below.



Press the [SEL] button several times to get both the "SHUTTER" and the "SET" indicator lamps are lighted. The currently specified shutter open time is displayed in the display window (in the second unit).

Press the [▶] button. The first digit begins blinking.

Press the [ ] button to set the digit's value.

The selection cycle is 0 1 . . . . 9 0 .

Press the [▶] button again.

The selected value is written to memory, and the next digit begins blinking.

Press the [ ] button to set the value.

Continue until all digits have been set, and no digit is blinking.

Press the [SEL] button twice to return to the home position (the display showing the accumulative time that the lamp has been lighted).

To confirm the shutter open time which has been set, perform step above.

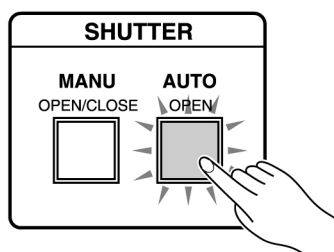


#### CAUTION



If the [SEL] button is pressed in the process of setting (when one of the digits is blinking), that setting value will not be accepted.

### Opening and Closing the Shutter



#### Control Panel (Local operation)

Press the [OPEN] button under "AUTO" once to open the shutter. After the set time has elapsed, the shutter closes automatically. When the shutter opens, the indicator lamp lights, and when the shutter closes, the lamp goes out.

#### External Control Signal (Remote operation)

Shorting Pins to for an instant (approximately 0.5 seconds) opens the shutter in Auto mode. After the set time has elapsed, the shutter closes automatically. When the shutter opens, Pin outputs ON signal, and when the shutter closes, Pin outputs OFF signal.

#### Note

When the shutter is open, it can be forced to close by pressing the [OPEN] button under "AUTO", or the [OPEN/CLOSE] button under "MANU".

## **Adjusting the Output Intensity**

The intensity, or volume of light, is adjusted using the "LIGHT CONTROL" adjustment knob on the front panel.

Turning the knob to the right (in the clockwise direction) increases the light intensity, and turning it to the left (counterclockwise) reduces the light intensity. Turning it all the way to the left reduces the output intensity to zero.

# Replacing the Lamp



## CAUTION



Before replacing the lamp, switch it off and run the cooling fan for at least 5 minutes.



Be very careful when handling lamps as they contain high-pressure gas (approximately 10 atmospheres at normal temperature) and may burst if dropped or otherwise impacted.



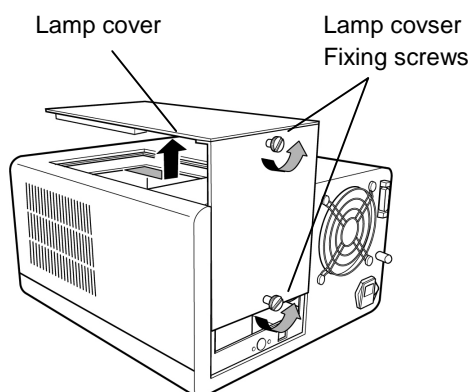
Be careful not to cause damage to the ellipsoid reflecting mirror.

## ■ Removing the Lamp

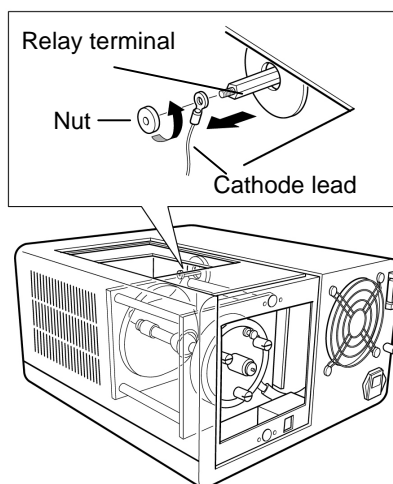
Turn off the lamp, and let the cooling fan run for at least 5 minutes.

After the internal temperature of the unit has dropped sufficiently, turn off the power switch, and unplug the Power Supply Cord from the outlet.

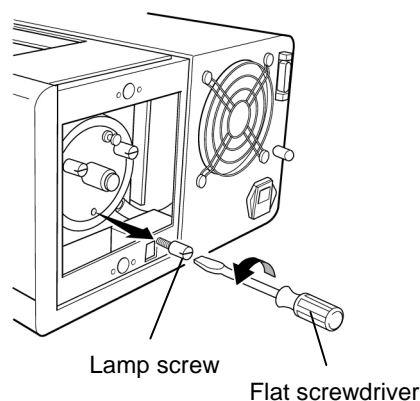
Loosen 2 screws that fix the lamp cover in place, and pull the lamp cover towards the back of the unit (until it stops). Then lift it up to remove it.



Remove the nut from the relay terminal (front side of the lamp housing), then remove the cathode lead.



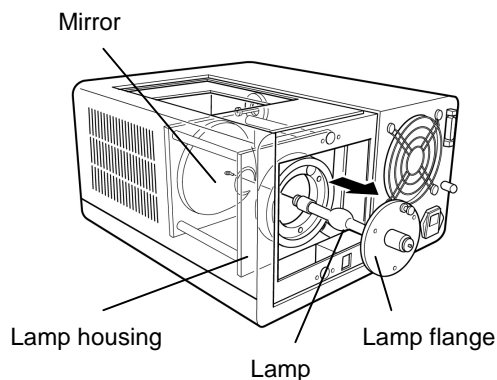
Use a flat screwdriver to loosen the three lamp screws holding the lamp in place. Hold the lamp flange in place with one hand and pull out the three lamp screws.



Grasp the lamp flange and pull the lamp gradually straight out from the housing.



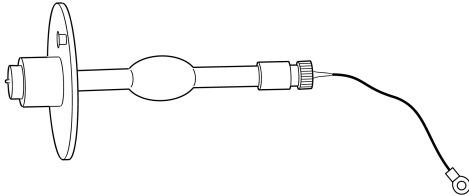
**At this time, be careful not to hit the lamp against the mirror or the lamp housing.**



**DO NOT touch the lamp with bare hand.**

### ■ Installing the Lamp

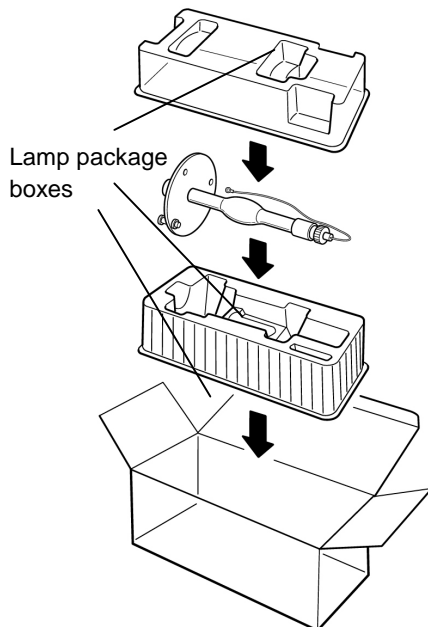
Take the new lamp out of the lamp package box.



#### REQUEST

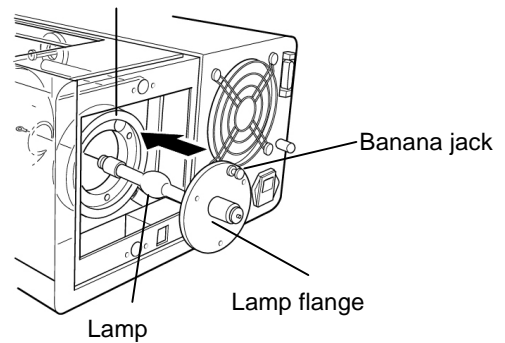


After the lamp has been replaced, please have the old lamp disposed by a specialist or send the old lamp to the nearby sales office. When sending the lamp, put it in the lamp package box used for the new lamp. (See page 35 for the address to which the lamp should be sent.)



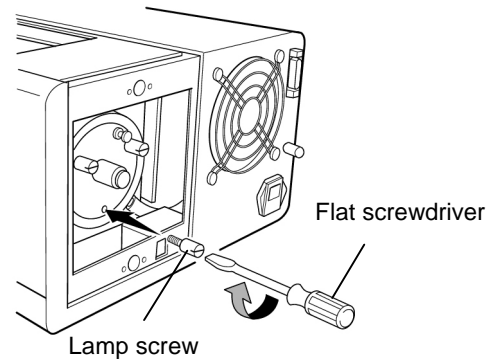
olding the flange of the new lamp, align the banana jack on the flange and the groove in the lamp housing and insert the lamp gradually straight into the housing (in the reverse order of the `Removing the lamp` procedure).

groove in the housing



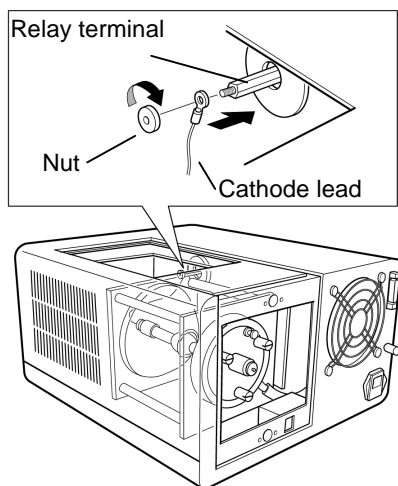
Insert the three lamp screws and tighten them evenly to fix the lamp in place.

- **Firmly tighten the screws using a screwdriver.**

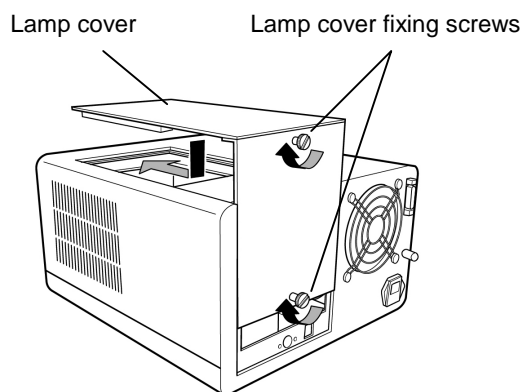


## Replacing the Lamp

Attach the lamp's cathode lead to the relay terminal (front side of housing), then fasten securely with the nut.



Fit the lamp cover tightly back in place and secure it by tightening 2 screws.



### CAUTION



If the lamp cover does not fit precisely, or has not been closed tightly, the interlock switch is activated, and the lamp cannot light. Always make sure that the lamp cover is installed securely.

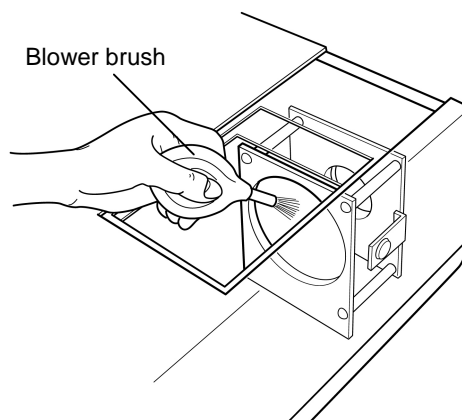


After replacing the lamp, be sure to reset the lamp counter. (Refer to page 20.)

## Caring For the Ellipsoid Reflecting Mirror

The surface of the ellipsoid reflecting mirror is treated with a special coating. When replacing the lamp, be very careful not to touch the surface of the mirror with bare hands, or to scratch or damage it.

- If the mirror is used with dirt or grime from your hands on the surface, the grime may burn into the surface, and the mirror will lose its permeability. This adversely affects the output intensity of the emission and the mechanical strength of the glass, and can cause cracks and other defects.
- If there is grime on the mirror surface caused by touching or handling it, do NOT remove it by wiping it with alcohol or other agents. This can destroy the special coating on the surface.
- Use only a blower brush to remove dust from the mirror surface.



# Filter Installation

A UV transmission filter : A4538 series (option) can be installed to the PHOTOCURE L8327.

## ■ Mounting the Filter



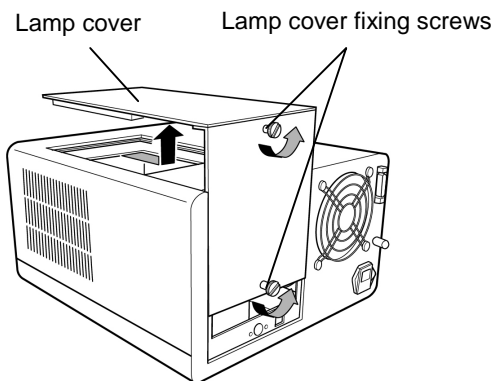
### CAUTION

Before mounting the filter, switch it off and run the cooling fan for at least 5 minutes.

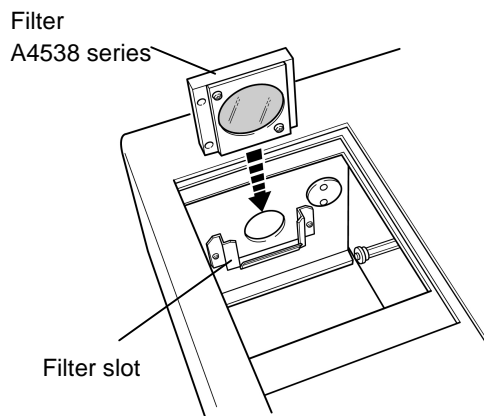
Turn off the lamp, and let the cooling fan run for at least 5 minutes.

After the internal temperature of the unit has dropped sufficiently, turn off the power switch, and unplug the Power Supply Cord from the outlet.

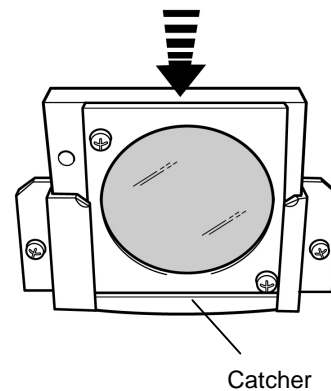
Loosen 2 screws that fix the lamp cover in place, and pull the lamp cover towards the back of the unit (until it stops). Then lift it up to remove it.



Insert the filter into the filter slot inside the unit, from top. Look carefully at the figure below, and make sure the filter is positioned in the correct orientation.



Press the filter downwards until it catches in the "catcher" at the bottom of the slot.



After the filter has been mounted, fit the lamp cover tightly back in place and secure it by tightening 2 fixing screws.

## Caring For the Filter

When installing and removing the filter, be careful not to touch the surface of the filter with bare hands, or to scratch or damage it.

- Any dirt on the filter surface should be removed by wiping the surface gently with a soft cloth dipped in alcohol and wrung out. Using a dirty filter can interfere with the performance of the filter.



# Specifications

## ■ General Ratings

Power input.....	AC 100 V to AC 240 V : Automatic setting Single phase, 50 Hz to 60 Hz
Power consumption .....	300 V · A max.
Ambient temperature for operation .....	+5 to +35
Operating humidity range .....	80 % max. , no condensation
storage temperature range .....	+5 to +35
storage humidity range .....	80 % max. , no condensation
Cooling method .....	Fan (forced-air volume = Approx. 1.5 m <sup>3</sup> /min)
Dimensions .....	(W) 290 mm x (H) 170 mm x (D) 320 mm (excluding protrusions)
Weight .....	Approx. 8 kg
Place for use .....	Indoors
Operating altitude .....	2000 m max.
Over voltage category .....	II
Degree of pollution .....	2
IP code .....	IP20

## ■ Lamp Section

Lamp.....	Mercury-Xenon Lamp (HPK : L8183)
Power consumption .....	Approx. 150 W
Lamp current (DC).....	8 A ± 0.5 A
Lamp voltage (DC).....	Approx. 23 V
Lamp's guaranteed life *1 .....	2000 h
Lamp's average life *2 .....	3000 h
Lamp replacement method.....	Cartridge replacement (no adjustment of optical axis)

\*1 This is the time that the ultraviolet output intensity remains at 50 % or more of the initial value. Turning the lamp on and off repeatedly at frequent intervals, however, can shorten the lifetime of the lamp, and should be avoided.

\*2 The lamp is guaranteed for up to 3000 hours of lighting time without cracking.

## ■ Optics System

Light condensation method .....	Reflection from elliptical surface (diameter 106 mm reflector)
Shutter .....	Rotary-solenoid type
Filter.....	Applicable in the main unit (optional) (HPK: A4538 series supported)
Output intensity adjustment .....	Mesh-type aperture (0 % to 100 % variable)
Light guide connection aperture .....	Diameter 13 mm standard (Fastened by M3 Light guide fixing screw)
Ultraviolet intensity .....	Typ. 3500 mW/cm <sup>2</sup> (at 365 nm)
Light-output stability.....	Within ± 5 %

## ■ Other Specifications

Momentary power-out handling .....	30 ms (duration of time free from malfunction such as lamp turning off)
Ultraviolet leakage .....	Not above 0.001 mW/cm <sup>2</sup> (nonvisible leakage)
Paint .....	Standard paint color used at HAMAMATSU PHOTONICS
Displays .....	Back side printed film attached (standard color and lettering used at HAMAMATSU PHOTONICS)
EMC applicable standard.....	EN61326: 1997 + A1: 1998 +A2: 2001
Safety applicable standard .....	EN61010-1: 2001

# Troubleshooting

Before requesting repair, check the following points to determine whether you can correct the problem yourself.

System	Cause and Correction	Page referred to
Lamp fail to come on.	<ul style="list-style-type: none"> <li>The interlock has been activated. Firmly close the lamp cover.</li> </ul>	30
	<ul style="list-style-type: none"> <li>Lead wire from the lamp has come loose. Check that the cathode lead is properly connected.</li> </ul>	30
	<ul style="list-style-type: none"> <li>Lamp life has ended. (Lamp switch-on becomes more difficult after 3000 hours of operation.) Replace the lamp.</li> </ul>	28, 29
Shutter does not open.	<ul style="list-style-type: none"> <li>The rotary solenoid is broken. Replace the shutter unit.</li> </ul>	
Light output is poor.	<ul style="list-style-type: none"> <li>Lamp life has ended. (The lifetime is over when the quantity of light is 50 % of the initial level.) Replace the lamp.</li> </ul>	28, 29
	<ul style="list-style-type: none"> <li>The lamp is not installed properly. Match the lamp flange and the mirror holder receive side properly.</li> </ul>	29
	<ul style="list-style-type: none"> <li>The light intensity has been adjusted. (The aperture has been tightened to reduce the light volume.) Adjust the intensity using the "LIGHT CONTROL" knob.</li> </ul>	27
	<ul style="list-style-type: none"> <li>The filter has been deteriorated (if a filter is being used). Replace the filter.</li> </ul>	31
	<ul style="list-style-type: none"> <li>The input/output ends of the light guide are dirty. Wipe the end faces of the light guide clean with a gauze soaked with alcohol.</li> </ul>	18

If the symptom remains unsolved even after checking each of the above items, describe the trouble specifically and send the unit to the nearby sales office. (Refer to page 35 for the address.)



## CAUTION

When sending the equipment, pack it carefully and securely to prevent any possible damage during transportation. (Use the box in which the unit was delivered or a larger size box and fill it with cushion material.)

## Warranty and After Service

Hamamatsu Photonics have fully inspected this equipment and checked that its performance conforms to specifications. In the unlikely event of breakdown or other malfunction, contact Hamamatsu subsidiary or local distributor.

- (1) Unless otherwise stated by Hamamatsu subsidiary or local distributor, this equipment is under warranty for twelve months from the delivery date.
- (2) The warranty only covers defects in the materials and manufacturing of the equipment. You may be liable for repairs during the warranty period in the event of a natural disaster or if you handle the unit contrary to the instructions in this manual, use it without due caution, or try to modify it.
- (3) We will repair the equipment or replace it, subject to availability, free of charge within the terms of the warranty.

### Repairs

- (1) If you notice anything wrong with the equipment, confirm whether or not it is malfunctioning by referring to the TROUBLESHOOTING checklist in this instruction manual. You must first clarify the symptoms in order to avoid any misunderstanding or error.
- (2) If you have any trouble or are unclear about anything, contact Hamamatsu subsidiary or local distributor giving the product name, serial number and details of the problem. If Hamamatsu Photonics consider the problem to be a malfunction, we will decide whether to dispatch an engineer or have the equipment returned to us for repairs.



#### CAUTION

**This equipment includes optical precision parts made of glass and a power source generating a high voltage.**

**Do not remove the cover or replace the parts unless unavoidable. The optical axis adjustment might deviate and the equipment might not perform correctly.**

## Contact Information

### **HAMAMATSU PHOTONICS K. K., Systems Division**

812 Joko-cho, Hamamatsu City, 431-3196, Japan  
Telephone (81)53-431-0124, Fax: (81)53-435-1574  
E-mail: [export@sys.hpk.co.jp](mailto:export@sys.hpk.co.jp)  
<http://www.hamamatsu.com/>

#### U.S.A. and Canada

### **Hamamatsu Photonic Systems**

360 Foothill Road, Bridgewater, N.J. 08807-0910, U.S.A.  
Telephone: (1)908-231-1116, Fax: (1)908-231-0852  
E-mail: [usa@hamamatsu.com](mailto:usa@hamamatsu.com)

#### Germany

### **Hamamatsu Photonics Deutschland GmbH**

Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany  
Telephone: (49)8152-3750, Fax: (49)8152-2658  
E-mail: [info@hamamatsu.de](mailto:info@hamamatsu.de)

#### France

### **Hamamatsu Photonics France S.A.R.L.**

8, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Codex, France  
Telephone: (33)1 69 53 71 00, Fax: (33)1 69 53 71 10  
E-mail: [info@hamamatsu.fr](mailto:info@hamamatsu.fr)

#### United Kingdom

### **Hamamatsu Photonics UK Limited**

2 Howard Court, 10 Tewin Road, Welwyn Garden City  
Hertfordshire AL7 1BW, United Kingdom  
Telephone: (44)1707-294888, Fax: (44)1707-325777  
E-mail: [info@hamamatsu.co.uk](mailto:info@hamamatsu.co.uk)

#### North Europe

### **Hamamatsu Photonics Norden AB**

Smidesvågän 12, SE-171 41 Solna, Sweden  
Telephone: (46)8-509-031-00, Fax: (46)8-509-031-01  
E-mail: [info@hamamatsu.se](mailto:info@hamamatsu.se)

#### Italy

### **Hamamatsu Photonics Italia S.R.L.**

Strada della Moia, 1/E 20020 Arese (Milano), Italy  
Telephone: (39)02-935 81 733, Fax: (39)02-935 81 741  
E-mail: [info@hamamatsu.it](mailto:info@hamamatsu.it)