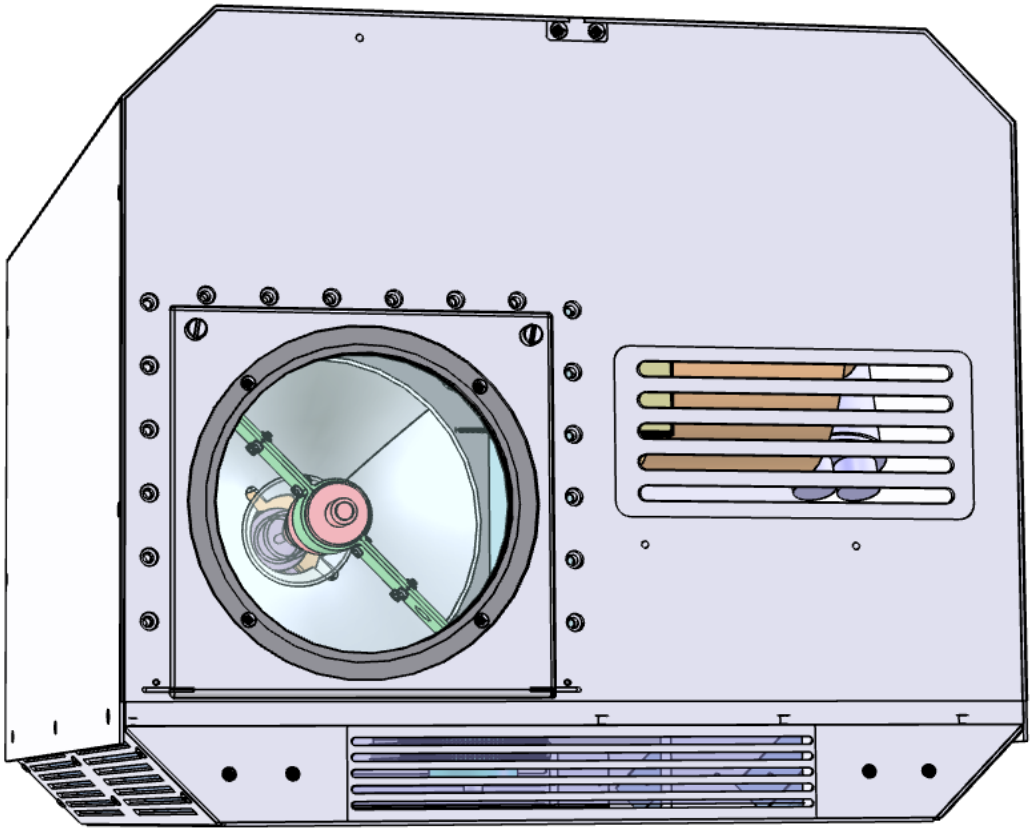
KiloArc Lamp

Operation Manual

Revision N



Please read this manual before working with this lamp. There is a risk of causing the lamp to be damaged or even explosion of the bulb.

OPTICAL BUILDING BLOCKS

OBB

CORPORATION

KiloArc Lamp Operation Manual

Revision N

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Fax: 732-623-8129. Email: info.sci@horiba.com Website: www.obbcorp.com.
Specifications and contents are subject to change without notice.

OBB Standard Instrument Warranty

Warranty Period and Extent

Optical Building Blocks Corporation (OBB) 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 OBB.

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. OBB shall not be responsible for any liability, loss or damages, caused or alleged to be caused, by the instrument, 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 instrument components not manufactured by OBB (e.g. computers and components thereof).
3) Fiber optic bundles and liquid light guides are not covered by the warranty.
4) KiloArc users must purchase replacement lamps from OBB, as OBB KiloArc lamps have custom adapters that are necessary for simple lamp replacement. The use of arc lamps not supplied by OBB (or approved in writing by OBB) will void OBB'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 OBB, 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) Damage or loss caused by shipping is not covered by the warranty.
8) Damage caused by improper operation of the instrument will void the warranty.
9) Damage caused by equipment not purchased from OBB that is attached to the instrument is not covered by the warranty.
10) Warranty is valid only in the state, province or country of the original purchase.
11) Software upgrades performed on an OBB supplied computer workstation (e.g., adding word processors, image editors, etc.) not authorized by OBB will void the warranty on the computer.
12) Hardware upgrades performed on an OBB supplied computer workstation (e.g., adding network boards, sound cards, etc.) not authorized by OBB will void the warranty on the computer.

Warranty Returns

A Return Material Authorization (RMA) Number must be obtained from the OBB Service Department before any items can be shipped to the designated service facility. Returned goods will not be accepted without an RMA Number. All goods to be returned should be properly packed to avoid damage and clearly marked with the RMA Number.

Warranty Repairs

The customer will bear all shipping charges for warranty repairs. All service rendered by OBB will be performed in a professional manner by qualified personnel.

Software

OBB makes no warranties regarding either the satisfactory performance of the software or the fitness of the software for any specific purpose. OBB 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.

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 into the lamp housing when there is power applied to the unit and the bulb is lit, 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.

Do not put any exposed skin or combustible materials in the path of the beam. Clothing may not provide sufficient protection against the UV and may also catch fire. The intense UV can cause a severe burn in seconds (it may take a day for such a burn to become evident).

If you need to look at the focused light from an arc lamp, e.g., at the entrance slit of an excitation monochromator, use welder's grade 5 (or higher) goggles to protect your eyes against intense UV light (Note: welder's grade 5 refers to the attenuation of the UV light. The amount of visible light transmitted by such goggles is not specified and may still be too intense to look at).

If you are working with a properly shielded lamp and not looking directly at the bulbs emission or its focused beam, then you may use plastic lens glasses or safety goggles as these provide sufficient attenuation of scattered UV light.

Some compact arc bulbs produce ozone that is considered toxic when at relatively high concentration levels.

HANDLING OF BULBS

Because of the risk of bulb explosion, contact with lethal electrical current, and intense UV light, never operate an unshielded arc bulb. Only operate it inside the proper lamp housing.

Special packaging is used for the transport of compact arc bulbs. Keep the packaging until the bulb has been properly disposed of.

Compact arc bulbs contain a highly pressurized gas, and present an explosion hazard ***even when cold***. Wear face protection, such as a protective face shield that protects the eyes and neck, whenever handling bulbs.

Never touch the quartz envelope with bare hands; such handling may lead to deterioration and premature failure of the arc bulb, and consequentially, a potential for the bulb to explode. Soft cotton gloves should be worn when removing and installing bulbs.

In the rare case that a mercury bulb explodes and the mercury is released from its envelope, it is recommended that that all personnel should leave the immediate area **at once**, so that no mercury vapor is inhaled. The area should be ventilated for a minimum of 30 minutes. When the lamp housing has cooled any mercury residue should be picked up with a special adsorptive agent.

Table of Contents

Introduction

General

The KiloArc Lamp houses either a Xenon or Mercury-Xenon 1000 W bulb and can be operated in the range 800 to 1200 W. The lamp is configured for either manual operation or computer controlled operation. KiloArc users must purchase replacement lamps from OBB, as OBB KiloArc lamps have custom adapters that are necessary for simple lamp replacement. The use of arc lamps not supplied by OBB (or approved in writing by OBB) will void OBB's warranty on all illuminator subsystem components.

Specifications

Input

Parameter	Min.	Typ.	Max.	Units	NOTES
Nominal Operating Voltage Range	210	230	240	V_{RMS}	@ 50/60 Hz
Maximum Operating Voltage Range	210		240	V_{RMS}	@ 50/60 Hz
Input Current RMS			7.72	A	@210 V_{RMS}, 60 Hz
Inrush Current @ Lamp Enable			37	A	At 240Vac
AC Input Fuse Protection			10	A	slow blow 3AG
Ground Leakage Current			1.50	μA	EMI line filter
Frequency Range	47		63	Hz	
Number of Phases	1	1	1		
AC Hold-Up Time	10			ms	@ 50 Hz
Overall Efficiency	80			%	230 VAC input, full power output

Dimensions (W x H x D) (14.78 x 12.94 x 20.88) inches, (375 x 329 x 530) mm
Weight 68 lb 31 kg

Lamp housing window
Dimensions: 5.0 inch diameter, 0.125 inch thick
Material: Optical Grade Fused Quartz

Focal point information
Distance from the front of lamp housing to focus for f/4 reflector: 17.475 inches (443.87mm).

Operating system for computer control
Windows XP or 7 (32- or 64-bit)

Operating Parameters

Bulb Type	Recommended Power[1] (W)	Minimum operating time after ignition (minutes)	Minimum time before re-ignition after turn OFF (minutes)	Bulb Lifetime[2] (hours)
Hg-Xe	800 – 1000	15	15	1500
Xe	800 – 1000	0	0	1500

1. The lamp can be operated safely from 800 to 1200 W. It is recommended to operate it in the range 800 to 1000 W (see the next note).
2. Average bulb lifetime when operated at 1000 W. Operating the lamp at 800 W can increase the bulb lifetime by ~ 5 %. Operating the lamp at 1200 W can decrease the bulb lifetime by ~ 10 %. The bulb lifetime will decrease 10 to 20 minutes for each ignition (both bulb types).

Dimensional

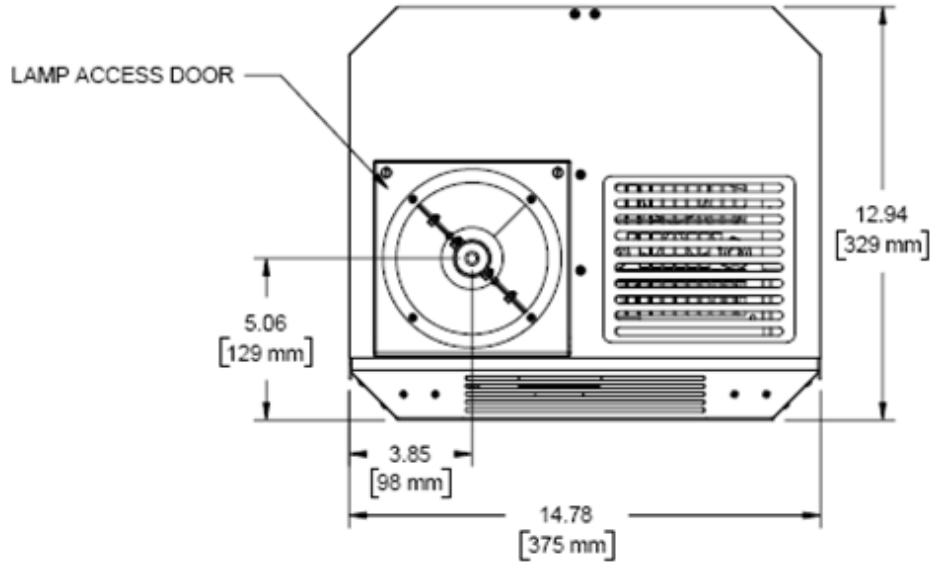


Figure 1 – Front view of lamp housing

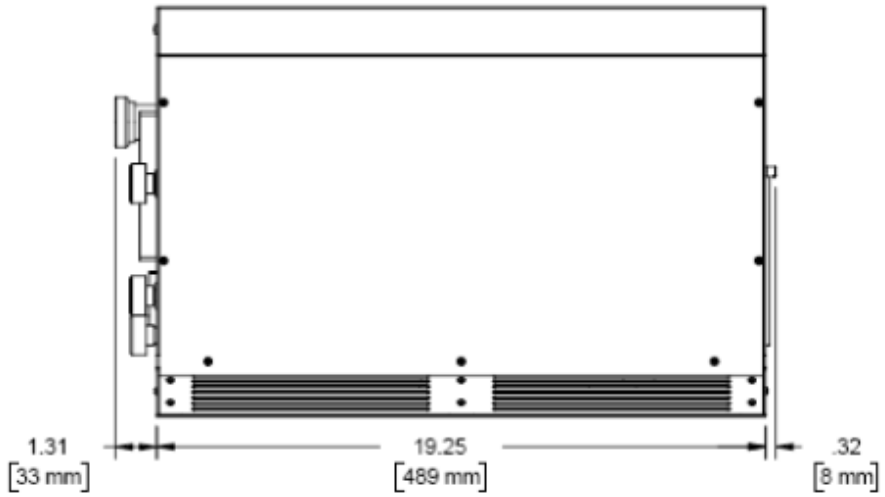


Figure 2 – Top view of lamp housing

Exterior Features

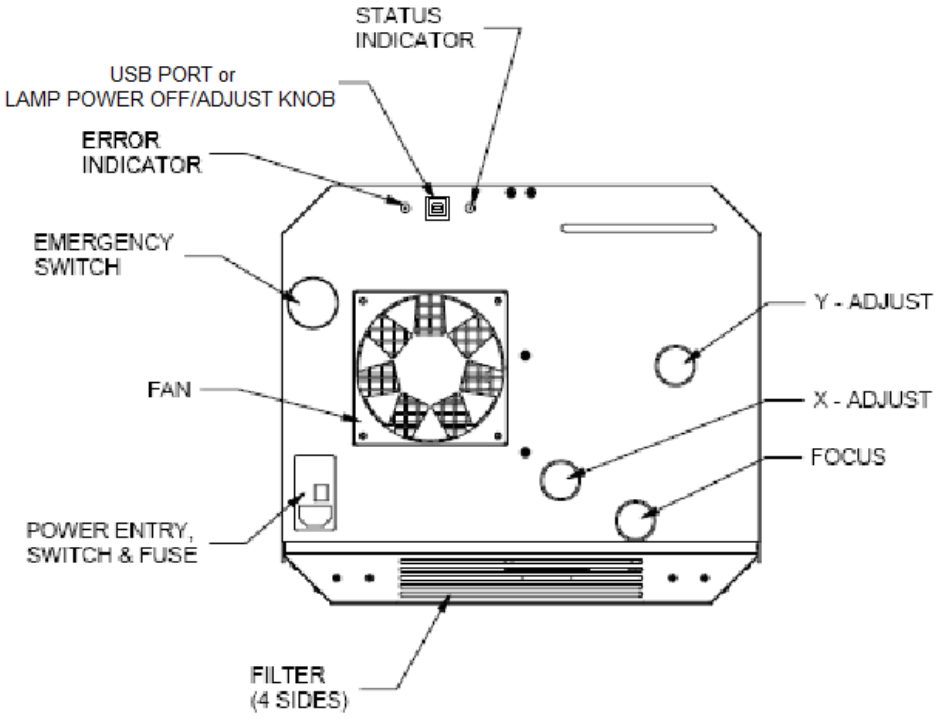


Figure 3 – Rear view of lamp housing

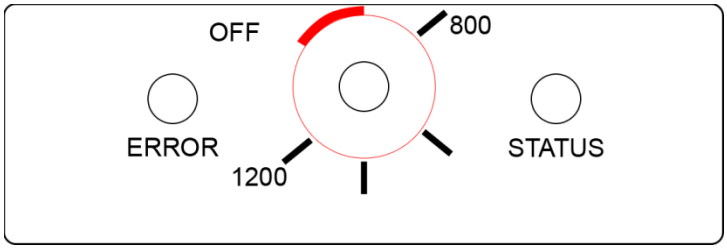


Figure 4 – Lamp Power OFF/Adjust, error and status indicators

Tools required

To install and replace a bulb assembly
This is a no-tool bulb change system.

To replace window
2 Philips screw driver – flat head screws in window retaining ring

To install the airflow output adapter
3/16” Hex key (Allen wrench)

Other
Isopropyl alcohol or acetone and lint free tissue to remove any residue accidentally put on the bulb surface.

Controls and Indicators

Lamp Adjustment

See figure 3 for the position of the USB port if the lamp is configured for computer control, or the lamp power adjustment controls if the lamp is configured for manual operation.

The focus knob on the rear of the unit allows translation of the bulb assembly along the optical axis defined by the reflector.

The lower knob with the left/right arrow (x-adjust) swings the bulb assembly left or right. Clockwise rotation of the knob swings the anode end of the bulb to the left (when looking from behind the reflector) and counterclockwise rotation of the knob swings it to the right. I.e., the anode end of the bulb assembly moves in the opposite direction as the top of the knob.

The upper knob with the up/down arrow (y-adjust) tilts the bulb assembly up or down. Clockwise rotation of the knob tilts the anode end of the bulb assembly up and counterclockwise rotation of the knob tilts the anode end down. I.e., the anode end of the bulb assembly moves in the same direction as the left side of the knob.

Electronic

Power ON/OFF: Supplies power to the entire unit.

Fuses: 2 x 10A, 250V slow blow, 3AG type.

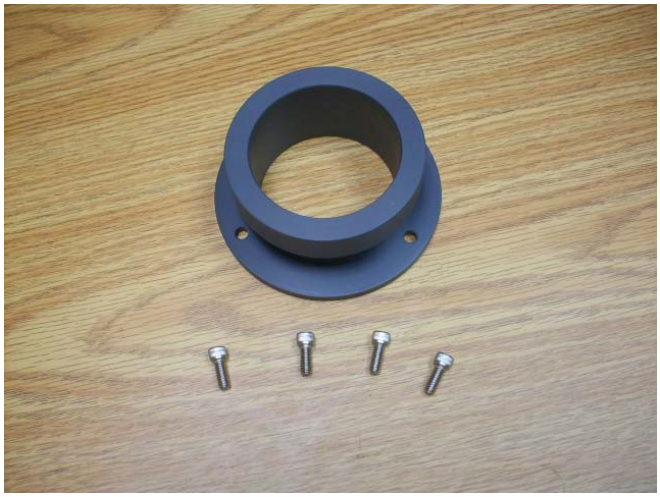
Emergency Switch: Sends a signal to the control board to immediately remove power to the lamp. The emergency switch is reset by pulling the knob away from the lamp unit.

Status Indicator:
- Set to green when in operating or standby mode
- Set to blue when in cooldown mode
- Set to red when an error occurs

Error Indicator:
- Flashes red when an error has occurred (see Error Codes in the Troubleshooting section)
- Off when there is no error condition

Power OFF/Adjust knob or USB port:
- For manual operation the Power OFF/Adjust knob adjusts the power level of the lamp and is used for normal lamp turn off (see the Operation section for further description).
- For computer controlled operation the USB cable from the computer connects to this port.

Installing the airflow output adapter



1. Using a 3/16” Hex Allen wrench and the four screws included, secure to the top of the unit.

This completes the airflow output adapter installation.

Bulb Installation

Compact arc bulbs contain a highly pressurized gas, and present an explosion hazard ***even when cold***. Wear face protection, such as a protective face shield that protects the eyes and neck, whenever handling bulbs.

Because of the risk of bulb explosion, contact with lethal electrical current, and intense UV light, never operate an unshielded arc bulb. Only operate it inside the proper lamp housing with the lamp access door closed.

Soft cotton gloves should be worn when removing and installing bulb assemblies or reflectors.

Never touch the quartz envelope with bare hands; such handling may lead to deterioration and premature failure of the arc bulb. If accidentally handled, wipe the bulbs surface with a lint-free tissue with isopropyl alcohol or acetone swab to remove any residue.

The reflector interior surface is coated. If it is accidentally touched with bare fingers or otherwise, it cannot be cleaned and do not attempt to do so. Over time this mark may discolor.

Do not use any tools to pull on the cathode handles when removing or installing the bulb assembly in the lamp unit. This could apply enough pressure through the metal to crack the ceramic seal and release the gas rendering the lamp useless.

1. Wear protective gear when installing, replacing, removing, or working with the bulb in general.
2. Remove all power from the unit by unplugging it from its power source.

3. Loosen the two thumbscrews (figure 5) on the front of the lamp access door.

Figure 5 – Opening the lamp access door

4. Gently allow it to lower completely to its full open position (figure 6). Locate the bulb release lever handle in the lower left part of the bulb chamber.

Figure 6 – Lamp access door open

5. Pull out the lever toward the front of the unit and rotate it to the right (figure 7) until it reaches its fully open position (figure 8).

Figure 7 – Bulb release lever partially open

Figure 8 – Bulb release lever fully open

6. Bring the bulb assembly with its protective wrap to the table where the lamp housing is placed. It is sometimes difficult to untie cords with the soft cotton gloves on, or the soft cotton material is snagged by the Velcro barbs. Therefore, with the soft cotton gloves off, untie the cords or remove the Velcro straps around the protective wrap, but do not unwrap the bulb.
7. Put on face protection and soft cotton gloves, and then remove the protective wrap from around the bulb (figure 9).

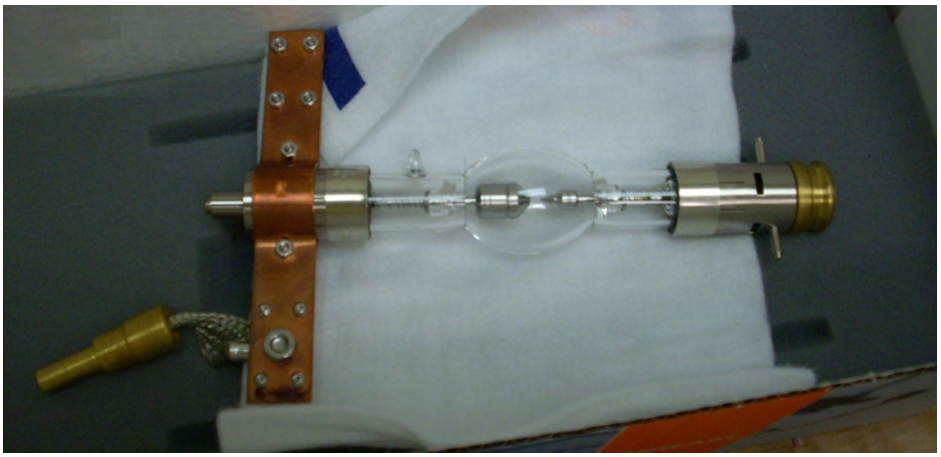
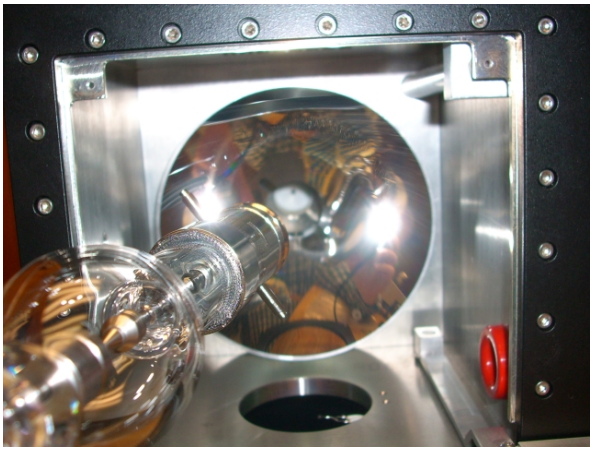


Figure 9 – Bulb assembly on protective wrap

8. Align the bulb assembly with the pass thru opening in the reflector such that the anode cooling fin is positioned diagonally from upper left to lower right with the braided cable and anode connector at the lower right, and the alignment pins on the cathode are lined up with their corresponding diagonal slots in the reflector opening.

   Carefully guide the cathode end of the bulb assembly (the end without the cooling fin attached) into the lamp chamber (figure 10).

   Make certain that the bulb assembly is inserted all of the way into the cathode adapter until it is fully seated at the rear (figure 11).



Figures 10 and 11 – Inserting the bulb assembly into the lamp chamber

9. Install the Teflon insulator on the end of the anode connector (figures 12 and 13).

Figures 12 and 13 – Installing the Teflon insulator on the end of the anode connector

10. Insert the anode connector into the side panel receptacle (figure 14).

Figure 14 – Inserting the anode connector into the side panel

11. Carefully move the bulb release lever back into its locking position (figures 15 - 17). Only rotate the lever far enough to feel that the tension is increased indicating that the bulb is secure. If tension is felt somewhere along the halfway point of rotation, the bulb is not correctly seated. Open the lever again, reseat the bulb, and try to rotate the lever closed again.

Figures 15 and 16 – Closing the bulb release lever

Figure 17 – Bulb in place, anode connector in receptacle, and bulb release lever closed

12. Close the lamp access door, and tighten the thumbscrews completely. This completes installation of the lamp assembly (figure 18).

Figure 18 – Lamp access door closed

Bulb Removal

1. Click on the SHUT OFF button to extinguish the lamp. Allow the fan to run 15 minutes before flipping the ON/OFF on the control panel to OFF. Wait at least another 15 minutes for the lamp to cool down.

2. Bring the protective wrap to the table where the lamp housing is placed. Untie the cords or remove the Velcro straps around the protective wrap, so it is ready to receive the lamp.

3. Loosen the two thumbscrews on the front of the bulb access door (figure 19).

Figure 19 – Opening the lamp access door

4. Gently allow it to lower completely to its full open position (figure 20).

Figure 20 – Lamp access door open

5. Locate the bulb release lever handle in the lower left part of the bulb chamber (figure 21).

Figure 21 – Bulb release lever handle

6. Pull out the lever toward the front of the unit and rotate it to the right (figure 22) until it reaches its fully open position (figure 23).

Figure 22 – Bulb release lever partially open

Figure 23 – Bulb release lever fully open

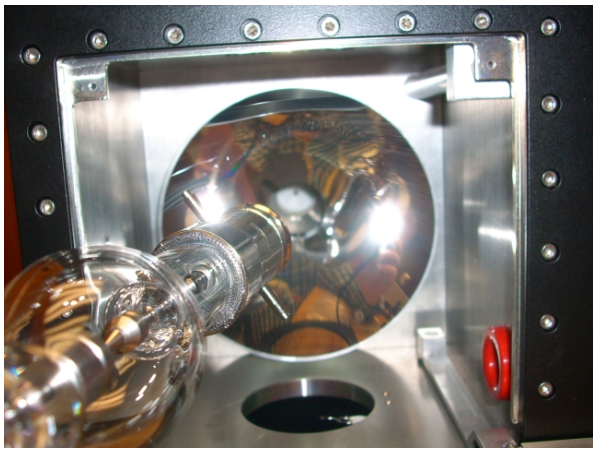
7. Carefully remove the anode connector from the side panel receptacle (figures 24 - 25).

Figures 24 - 25 – Removing the anode connector from the side panel receptacle

8. Remove the Teflon insulator from end of the anode connector (figure 26).

Figure 26 – Removing the Teflon insulator from end of the anode connector

9. Grab hold of the bulb assembly, and carefully slide the bulb assembly out of the reflector, and out of the bulb chamber (figures 27 -28).

Figures 27 – 28 – Removing the bulb assembly from the lamp chamber

10. Place the bulb assembly on the protective wrap and fold the wrap ends over the bulb. Tie the cords or the Velcro straps around the protective wrap. Place the wrapped bulb assembly in the box.
11. If not installing a new bulb in the KiloArc, close the lamp access door and tighten the two thumbscrews.

Operation:

You should keep a log of lamp usage showing hours used, cumulative hours used, and operating power.

Lamp operating cycle

During operation, Mercury-Xenon lamps need to go through a cycle to maintain useful lamp life. When ignited, the Hg-Xe lamp should remain on for a minimum of 15 minutes to allow the mercury to evaporate completely. When turned off, do not re-ignite the lamp for a minimum of 15 minutes to allow the mercury to condense completely within the lamp bulb. If this cycle is not followed the lamp life will become significantly reduced (the lamp will fail to ignite).

In contrast, Xenon lamps may be turned off immediately after ignition and re-ignited immediately after being turned off.

Modes of operation

Mode	**Status light**	**Blower**	**Bulb**
Cooldown	Blue	ON	OFF
Standby	Green	OFF	OFF
Operating	Green	ON	ON
Error	Red		

User operations
Manual control is not possible with the USB option (and vice versa).

Instrument type	**Manual control**	**Computer control**
Start operation	The power control knob is moved from OFF to the operating (800 – 1200 W) region.	A **Start Lamp** command is sent from the computer.
Extinguish operation	The power control knob is moved to the OFF position.	A **Stop Lamp** command is sent from the computer.
Lamp output adjustment	The power control knob is moved to another position in the operating (800 – 1200 W) region.	Enter a level in the **Power** text box or move the needle on the **Power** dial, and then click the **Set power (SPI)** button.

Cooldown:
This condition occurs whenever the unit is first powered on, and whenever the lamp extinguishes the bulb. Cooldown mode is a mode when the blower is running, and the lamp is waiting for a start operation. There is no illumination from the error indicator. The status indicator is

illuminated blue. The lamp system will stay in this mode until the internal timer times out (a couple of minutes), an error occurs, or the lamp receives a start operation. If a timeout occurs, the blower is turned off, and the unit is put in standby mode.

Standby:

This mode occurs when the cooldown mode times out waiting for a start operation. The blower is off, there is no illumination of the Error indicator, and the Status indicator is illuminated green. When a start operation is received, the blower is turned on, then after a 3 second delay, the lamp ignites the bulb and the lamp system is put into operating mode.

Operating:

The blower is on, the bulb is lit, the Error indicator is not illuminated, and the Status indicator is illuminated green. From here, the user may extinguish the lamp, or adjust the light output.

Error codes:

This is the list of error codes that the lamp unit can detect:
#1 EMERGENCY KILL SWITCH TRIGGERED
#2 TEMPERATURE SWITCH FAULT CHASSIS OVERHEATING
#3 ACCESS DOOR SWITCH NOT SET
#4 LBM_HOT FROM BALLAST INDICATES BALLAST OVERHEATING
#5 USB CABLE REMOVED - DISCONNECTED FROM HOST COMPUTER
#6 AIRFLOW SENSOR DETECTING INADEQUATE COOLING DUE TO LACK OF AIRFLOW
#7 BULB DIDN'T EXTINGUISH AFTER INSTRUCTED TO DO SO. ENGAGE EMERGENCY KILL SWITCH, WAIT 5 MINUTES, THEN TURN OFF POWER. RESTART SOFTWARE, WAIT 1 MINUTE. TURN ON POWER
#8 AIRFLOW CIRCUITRY MALFUNCTION

Notes: LBM = Lamp Ballast Module. This includes the lamp power supply, ballast and igniter and is continuously cooled by the fan.

When an error occurs, the status indicator turns red, and the error indicator flashes the error code of that fault. In addition, when using computer control, the **ERROR** light in the program window flashes and an error message is displayed.
All error codes are ½ second on, ½ second off, repeating for the number of times as the code number, then 1 ½ second off before repeating the cycle.

(1)Emergency Kill Switch, (2)Temp Switch, (3)Access Door Switch, (4) LBM_HOT, (6)Airflow Sensor, and (8)Airflow Circuitry:
The lamp system immediately extinguishes the bulb, the status indicator turns red, and the error indicator flashes the error code cycle (see above) continuously.
-- If the error was detected when the bulb was not illuminated, the error may be cleared by resetting the emergency kill switch, and the unit will cease to flash the error indicator code, and

the status indicator will turn blue indicating cooldown mode. Operation of the lamp system may proceed.
-- If the error was detected when the bulb was illuminated, the Emergency Kill switch must be reset (pull the Emergency Kill switch out from the lamp unit), the error indicator will stop flashing the error code, but the status indicator will be illuminated red indicating that the start process needs to be recommenced.

For manual operation the user must move the Power/Adjust knob into the OFF region to reset the system, and then move the knob to start the lamp in the normal manner.

For computer controlled operation, the program must be restarted. There will then be an error condition #4 generated and this will clear after a few seconds and the lamp will enter cooldown mode. Operation of the lamp system via normal program control may then proceed.

Certain errors will cause the system to halt, requiring everything to be reset. The indication that the system is halted is indicated by the status indicator alternately flashing red then red/blue (purple) and the error indicator flashing the error code. These errors are as follows:

(5) USB cable disconnected from host computer – Wait five minutes, turn off power to the lamp unit, reconnect the USB cable, wait until the computer has detected reconnection to the (lamp) device (up to one minute), restart the computer program, and turn on power to the lamp unit.

(7) Bulb didn't extinguish after the computer instructed it to do so – Engage Emergency Kill switch, wait five minutes (for proper cooldown), turn off power to the lamp system, restart the computer program, reset the Emergency Kill switch (pull the Emergency Kill switch out from the lamp unit), turn on the power to the lamp system.

Manual Operation

Startup Procedure:

Plug the power cord into the power entry module located on the rear of the lamp unit (see figure 3 for location) and the other end into a 220 V AC line (mains) outlet.

Flip the ON/OFF switch located on the power entry module to the ON position. The lamp unit enters cooldown mode: the fan located on the rear of the lamp housing and the main cooling blower will start running and the status indicator will turn blue.

In order for the lamp to start the bulb, the power control knob must be set within the off region, and then brought up to reside within the 800 - 1200 W operating region. This will ignite the lamp at 1200 W (may take 2 to 20 seconds) and then drop the output down to the calculated value the manual control knob resides at. After the bulb is started and set, the output will remain set until the control is moved to another position in the 800 - 1200 W operating region. It is then calculated, and set again. When the output is decreased and the control position falls below the operating region and into the maintain minimum output region, the lamp output will remain set to 800 W. If the control moves down into the off region, the lamp immediately extinguishes the bulb and the system enters cooldown mode, the status indicator will turn blue, and the lamp waits for another start operation to occur. The lamp system will stay in cooldown mode until the

internal timer times out (a couple of minutes), an error occurs, or the lamp receives a start operation. If a timeout occurs, the blower is turned off, and unit is put in standby mode and the status indicator turns green.

If the lamp fails to ignite the bulb the user must return the control knob to the OFF region, and then to the 800 – 1200 W again to attempt to ignite the bulb. There is no error indication if the bulb fails to ignite.

While in cooldown mode, the unit may be used to ignite the bulb as noted above by moving the manual control to reside within the 800 – 1200 W operating region. A Mercury-Xenon (Hg-Xe) lamp should remain off for a minimum of 15 minutes before re-igniting the lamp. A Xenon lamp may be re-ignited immediately.

Shutting off the lamp

Turn the power control knob counterclockwise to the OFF region to stop the lamp. Allow the fan to run 15 minutes before turning off the lamp system to allow proper cooling of the lamp ballast module.

A Mercury-Xenon (Hg-Xe) lamp should remain off for a minimum of 15 minutes before reigniting the bulb. A Xenon bulb may be re-ignited immediately.

Emergency or error lamp shut off

If any error condition occurs, including pressing the red **EMERGENCY SWITCH** on the control panel, the status indicator will turn red and the error indicator will start flashing (see the Error Codes in the Troubleshooting section), and the lamp will immediately extinguish the bulb and keep checking to see if the error has cleared. Once the error is removed, the system waits for the user to move the manual control into the off region to reset the system, and then the operation of the system will be as described above.

Computer Controlled Operation

Software Installation:

1. Insert the DVD in the disc drive.
2. On the DVD file list double-click on **Autorun.exe**.
3. Select **Install MCC InstaCal** (agree to the license and use all the default settings).
4. Select **Install OBB_PS-1**.

The last step copies the OBB-PS-1 icon to the desktop and copies the OBB-PS1.exe file to C:\Program Files \OBB\OBB PS-1 (for Windows XP), or to C:\Program Files (x86)\OBB\OBB PS-1 (for Windows 7).

Or, you can run OBB PS-1 directly from the DVD without having to install it. You still need to install MCC InstaCal, though.

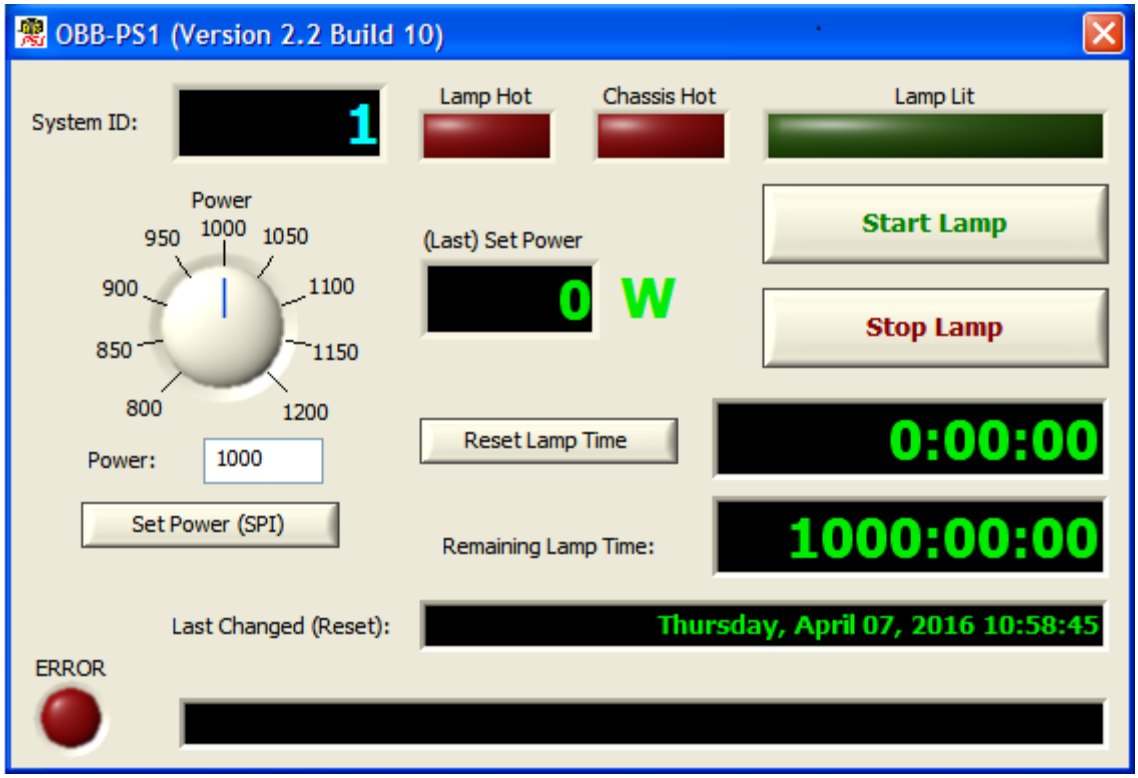
To launch OBB PS-1, double-click on the OBB PS-1 icon on the desktop or on the DVD.

Startup Procedure:

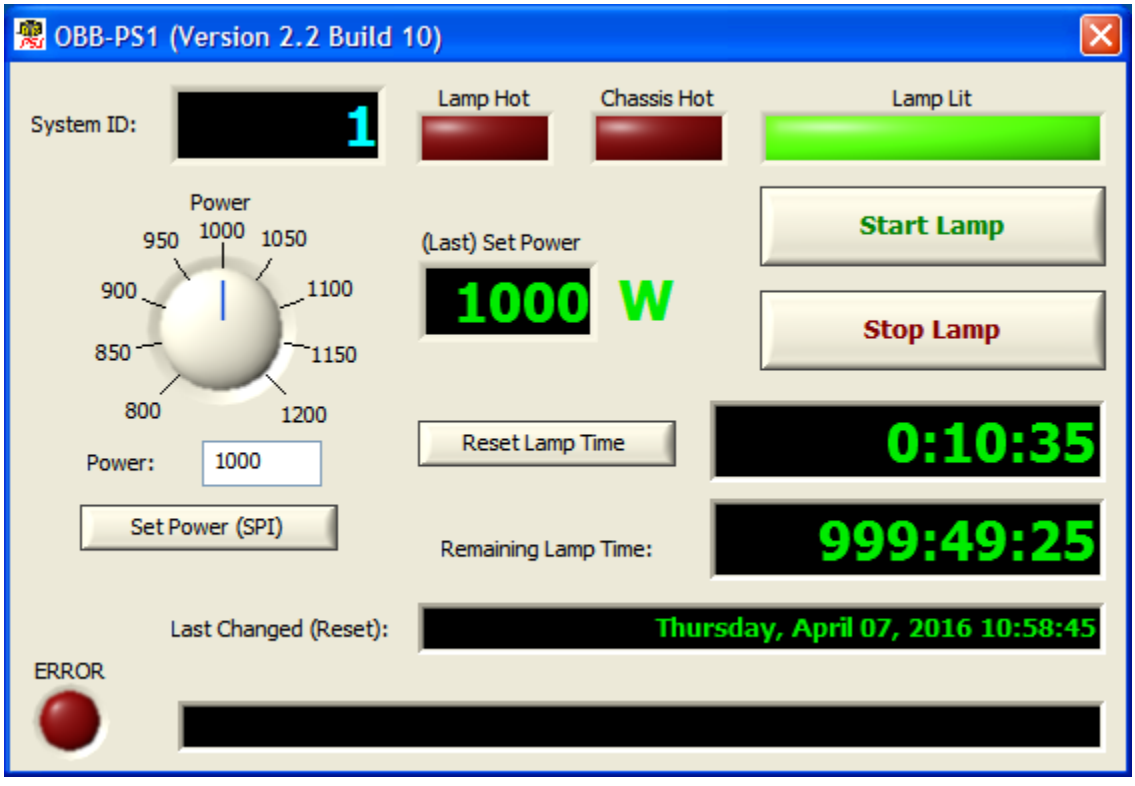
1. Plug the power cord into the power entry module located on the rear of the lamp unit (see figure 3 for location) and the other end into a 220 V AC line (mains) outlet.
2. Boot up the computer.
3. Attach the USB cable to host computer and then to KiloArc. It is ok to leave the USB cable connected to the computer and KiloArc Lamp when they are not in use.
4. Wait approximately 1 minute for the operating system to detect the unit being plugged in.
5. Flip the ON/OFF switch located on the power entry module to the ON position. The lamp unit enters cooldown mode: the fan located on the rear of the lamp housing and the main cooling blower will start running and the status indicator will turn blue.
6. Start the OBB-PS1 control program.
7. When using OBB-PS1 for the first time, the **Reset Lamp Time (Password protected)** window will be displayed.

   a. Skip the **Please Enter Current Password** box, and enter and re-enter a new password.
   b. Enter a value in the **Remaining Lamp Hours** box. See the Operating Parameters table on page 7 of this manual.
   c. Enter a system ID.
   d. Click **OK** to save the information and close the window.

8. The **Reset Lamp Time (Password protected)** window will close and the OBB PS1 window will open.



9. You must set a power level:
    a. Use the default value of 1000 W, or
    b. Enter a value between 800 and 1200 in the **Power** text box, or
    c. Click and drag the needle in the Power dial. It has a resolution of 10 W.
    d. Click the **Set Power (SPI)** button. This changes the (**Last) Set Power** level.
10. Click the **Start Lamp** button. This applies the (**Last) Set Power** level to the lamp. The



lamp is lit and the **Lamp Lit** changes to a bright green. The **Lamp Time** starts to count up and the **Remaining Lamp Time** starts to count down.

11. To turn off the lamp click the **Stop Lamp** button. The **Lamp Lit** changes to a dark green. The (**Last) Set Power** level, the **Lamp Time** and the **Remaining Lamp Time** retain their values.
12. In subsequent operation, you can just open the OBB-PS1 program and click **Start Lamp** to apply the (**Last) Set Power** level to the lamp. The (**Last) Set Power** level, the **Lamp Time** and the **Remaining Lamp Time** will show the values when the program was closed.
13. When you replace a lamp, click the **Reset Lamp Time** button, enter the password and set the new hours. The **Reset Lamp Time (Password protected)** window will be displayed.
    a. Enter the password in the **Please Enter Current Password** box.
    b. Enter a value in the **Remaining Lamp Hours** box. See page 7 Operating Parameters table.
    c. Enter a system ID.
    d. Click **OK** to save the information and close the window.
14. When an error occurs, the **ERROR** light in the program window flashes and the error code is displayed, in addition to the status and error indicator lights on the rear of the lamp housing.
15. The Lamp Hot light shows bright red when the airflow sensor detects inadequate cooling. This corresponds to error code 4.
16. The Chassis Hot light shows bright red when the chassis temperature switch faults indicating chassis overheating. This corresponds to error code 2.

Shutting off the lamp

Click the **Stop Lamp** button.

Allow the fan to run 15 minutes before turning off the lamp system to allow proper cooling of the lamp ballast module.

A Mercury-Xenon (Hg-Xe) lamp should remain off for a minimum of 15 minutes before re-igniting the bulb. A Xenon bulb may be re-ignited immediately.

Emergency or error lamp shut off

If any error condition occurs, including pressing the red **EMERGENCY SWITCH** on the control panel, the status indicator will turn red and the error indicator will start flashing (see the Error Codes in the Troubleshooting section), and the lamp will immediately extinguish the bulb and keep checking to see if the error has cleared.

Once the error is removed, the program must be restarted. There will then be an error condition #4 generated and this will clear after a few seconds and the lamp will enter cooldown mode. Operation of the lamp system via normal program control may then proceed.

Maintenance

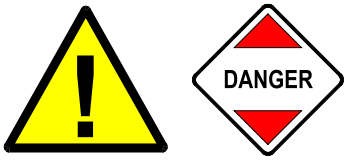
Refocusing the lamp

Re-focusing the lamp to maximize illuminator intensity is recommended after arc lamp replacement or any service to the excitation components of your instrument, or after every hundred hours of use.

The arc lamp housing uses an elliptical reflector to focus the light. The reflector position and orientation is set at the factory and should not need any adjustment. The reflector defines the optical axis and the best system throughput is found when the arc lies at one focal point. Since no two arc lamps are identical and since it is impossible at best to perform a lamp installation or replacement without altering any adjustments, the lamp must be refocused after replacement.

Focus Adjustment

Refer to figure 3 for the position of the lamp adjustment controls. Start with the KiloArc turned off. Place a target (such as a brick or black metal surface) at the distance from the front of the lamp housing to the focus for the f/4 reflector: 17.475 inches (443.87mm). Put on welder's goggles (grade 5 or higher) to observe the spot on the target. Turn on the KiloArc. Observe the spot while rotating the focus knob and then the x-adjust and y-adjust tilt knobs until the best focus is achieved.



WARNING: Only move the adjustment controls in small increments. All controls should move freely and easily with minimal amount of resistance met. If a control knob reaches its travel limit and stops, or if the control gets increasingly harder to turn, you have reached that control's maximum adjustment. Back off that control slightly, and if further focus adjustment is required, try adjusting the other two controls one at a time.

Failure to adhere to this warning may result in a damaged reflector, bulb assembly, or internal alignment mechanism that may also create a condition that can cause physical harm to the operator and/or surrounding bystanders.

If you have problems focusing the lamp contact OBB for assistance.

Replacing the Lamp

KiloArc users must purchase replacement lamps from OBB, as OBB KiloArc lamps have custom adapters that are necessary for simple lamp replacement. The use of arc lamps not supplied by OBB (or approved in writing by OBB) will void OBB's warranty on all illuminator subsystem components.

Soft cotton gloves should be worn when removing and installing bulb assemblies and reflectors.

Never touch the quartz envelope with bare hands; such handling may lead to deterioration and premature failure of the arc bulb. If accidentally handled, wipe the lamp surface with a lint-free tissue with isopropyl alcohol or acetone swab to remove any residue.

The reflector interior surface is coated. If it is accidentally touched with bare fingers or otherwise, it cannot be cleaned and do not attempt to do so. Over time this mark may discolor.

Follow the procedures in Bulb Removal and Bulb Installation.

Proper Disposal of Old Arc Lamps

Please contact OBB Corp for proper disposal of used arc lamps.

Replacing the Window

1. Use a # 2 Philips screwdriver to remove the four flat-head screws holding the retaining ring around the window (figure 29), while holding the retaining ring in place.
2. Remove the retaining ring, taking care that the window does not fall out.
3. Remove the window from its recess.
4. Place the new window into the recessed groove, place the retaining ring over the window and insert the four screws into the holes in the retaining ring.
5. Lightly tighten all four screws into the window retaining ring then tighten them with a finger tight grip on the screwdriver.

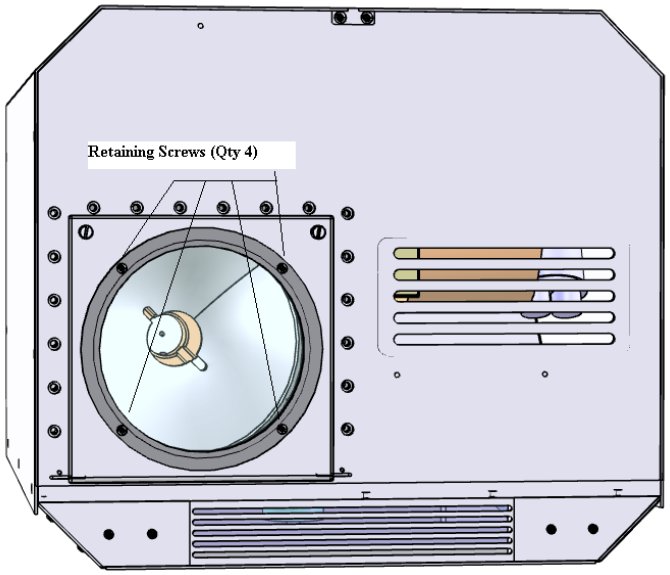


Figure 29 – Replacing the window

Troubleshooting

Error Codes
See figures 3 and 4 (page 8 of this manual) for the location of the error and status indicators.
Go to error codes (page 22 of this manual) for descriptions and recommended actions.

Line (Mains) Power Failure
In the event of the 220 V AC line (mains) power failure, the lamp power supply will turn off. A Mercury-Xenon (Hg-Xe) lamp should remain off for a minimum of 15 minutes before re-igniting the lamp. A Xenon lamp may be re-ignited immediately.

For further assistance, see the Service Calls to OBB section of this manual, page 37.

Ozone Emission Test

REASON FOR TEST:

To provide data pertaining to the emission of ozone from the KiloArc light source. (1100-0004)

TEST DESCRIPTION:

A KiloArc system is placed in a room with no functioning climate control system. The unit is turned on and the power output level is set to approximately 1000 Watts. A DVM is connected to a thermocouple, which is routed inside the door to monitor ambient temperature. A camera system is also routed through the door to remotely monitor the ozone meter that is located inside the room. The data is then logged at 15-minute intervals for a period of six and one-half hours.

REQUIREMENTS:

According to UL OZONE Standard 862, part 37.2: A room having a volume of 950 – 1100 cubic feet is to be utilized for the test. The room we are using is smaller so concentration levels would be higher, so a conversion factor needs to be used. We will use the lower volume size of 950 for our calculations since this would provide us with the highest level of concentration. We will also round down the Cu Feet of the room used to 784 in order provide a higher level of concentration

950 / 784 = 1.212

This number is to be used in calculating a 1:1 relationship of ozone levels in the room in our test versus the UL required volume.

ENVIRONMENT DESCRIPTION:

Room size: Length = 11 feet 6 inches
Width = 7 feet 7 inches
Height = 9 feet
Total Cu Feet = 784.875

EQUIPMENT USED:

KiloArc (1100-0004)
Bulb assembly containing one Ozone free 1000 W Xe bulb. (8700-0007)
Elenco M2625 DVM
EcoSensors A-21ZX Ozone monitor
FLUKE 80TX thermocouple module
Video camera
Laptop to view camera information

RESULTS:

The ozone meter had a baseline of 0.03 PPM so in chart 4, we subtracted that baseline to get the actual ozone emission coming from the unit. The emission of the unit was between 0 and 0.017 PPM over the six and one-half hours of operation.

CHART 1:

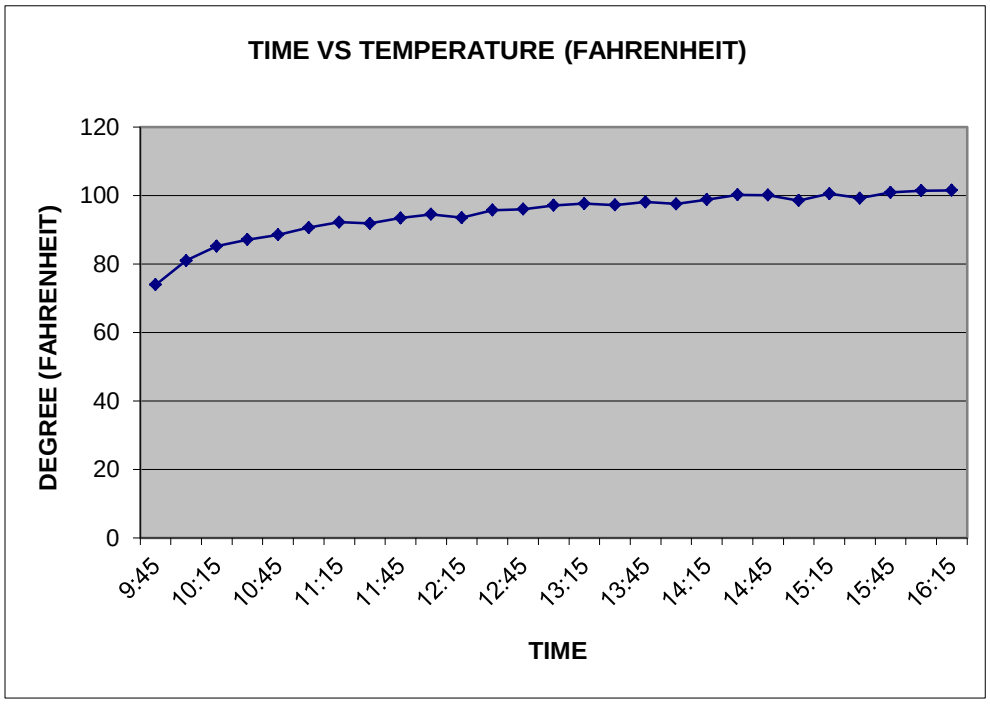


CHART 2:

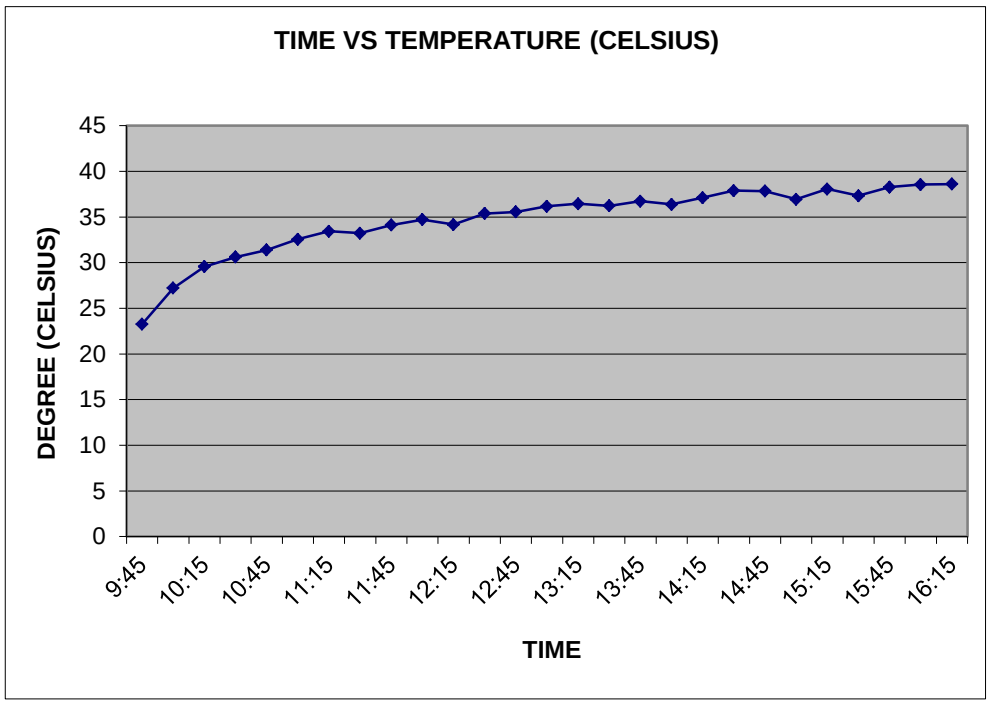


CHART 3:

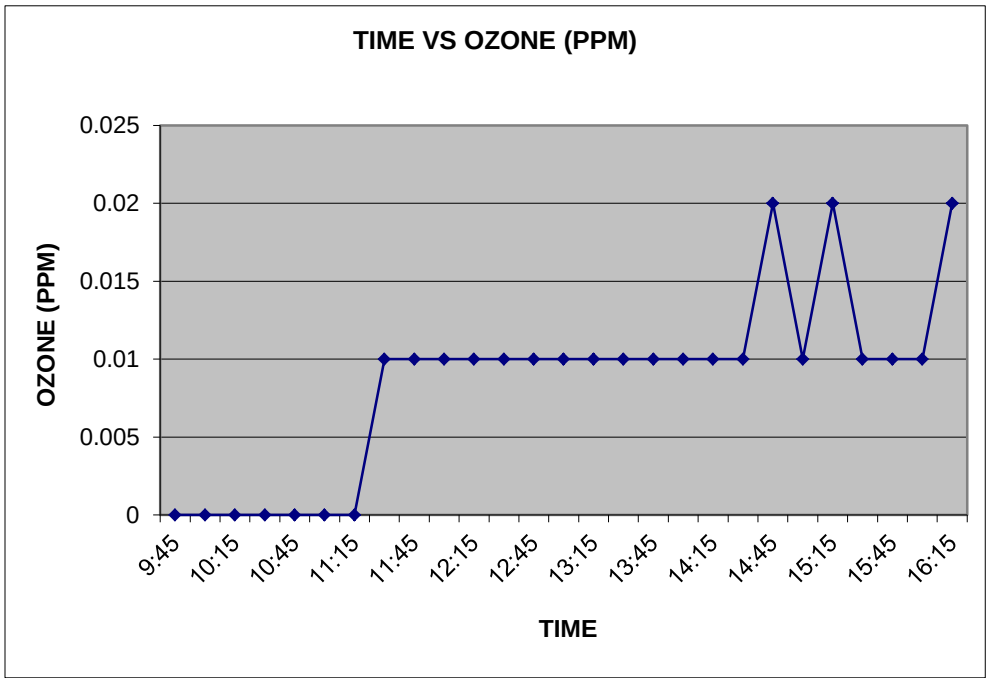
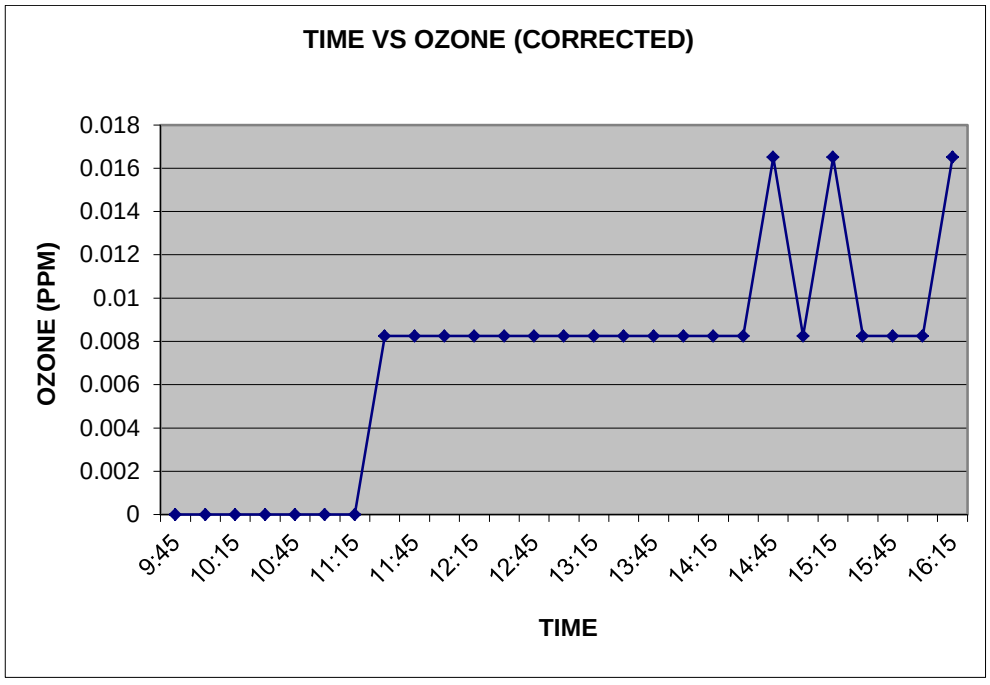


CHART 4:



CONCLUSION:

Testing indicates that the ozone emitted from the KiloArc system (1100-0004) is well below the 0.1 PPM OSHA requirements.

NIOSH Pocket Guide to Chemical Hazards

September 2005

NPG Home | Introduction | Synonyms & Trade Names | Chemical Names | CAS Numbers | RTECS Numbers | Appendices | Search

Ozone

CAS
10028-15-6

O_3

RTECS
RS8225000

Synonyms & Trade Names
Triatomic oxygen

DOT ID & Guide

Exposure Limits

NIOSH REL: C 0.1 ppm (0.2 mg/m^3)

OSHA PEL†: TWA 0.1 ppm (0.2 mg/m^3)

IDLH
5 ppm See: 10028156

Conversion
1 ppm = 1.96 mg/m^3

Physical Description
Colorless to blue gas with a very pungent odor.

MW: 48.0	BP: -169°F	FRZ: -315°F	Sol(32°F): 0.001%
VP: >1 atm	IP: 12.52 eV	RGasD: 1.66	
Fl.P: NA	UEL: NA	LEL: NA	

Nonflammable Gas, but a powerful oxidizer.

Incompatibilities & Reactivities

All oxidizable materials (both organic & inorganic)

Measurement Methods
OSHA ID214
See: NMAM or OSHA Methods

Personal Protection & Sanitation
(See protection codes)
Skin: No recommendation
Eyes: No recommendation
Wash skin: No recommendation
Remove: No recommendation
Change: No recommendation

First Aid
(See procedures)
Eye: Medical attention

Breathing: Fresh air; 100% O_2

Respirator Recommendations

NIOSH/OSHA
Up to 1 ppm:
(APF = 10) Any chemical cartridge respirator with cartridge(s) providing protection against the compound of concern
(APF = 10) Any supplied-air respirator
Up to 2.5 ppm:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered, air-purifying respirator with cartridge(s) providing protection against the compound of concern
Up to 5 ppm:
(APF = 50) Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against the compound of concern
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece
Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern /Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes

inhalation, skin and/or eye contact

Symptoms

Irritation eyes, mucous membrane; pulmonary edema; chronic respiratory disease

Target Organs

Eyes, respiratory system

See also: INTRODUCTION See ICSC CARD: 0068 See MEDICAL TESTS: 0172

Service Calls to OBB

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 OBB:

- Your system serial number, or as many other component serial numbers as possible
- The name of the purchaser or principal investigator, and the company or institution where the instrument is located.
- Your instrument type and hardware configuration
- Computer details, especially if the computer was not purchased from OBB:
  - Operating System and Operating System Service Packs installed (e.g., Windows XP Professional, year, Service Pack 3)
  - CPU – Intel or AMD
  - Hard drive size and amount of free space on the hard drive
  - RAM memory size
  - Video RAM size
  - Video card manufacturer and model number (if not on the computer motherboard)
  - An Ethernet port other than on the computer motherboard – manufacturer and model number
  - Any other peripherals attached to the computer
- The software name and version (in the program window, click on Help | About to find the software name and version information).
- 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.
- If possible, be prepared to send sample data and hardware and acquisition setup files as e-mail attachments to OBB service personnel.

Contact OBB Service at
Phone: 1-877-546-7422
Email: Scientificservice@horiba.com

VISIT OUR WEBSITE AT
www.obbcorp.com