

Compact High Intensity Light Source

General

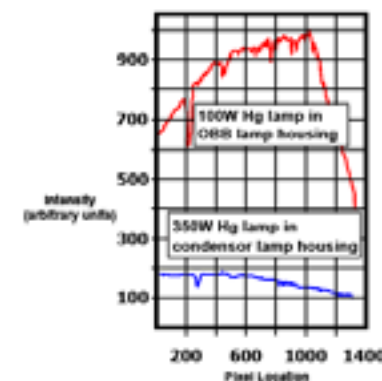
When a broadband light source in the ultraviolet-visible-near infrared portion of the spectrum is required, an arc lamp has no peer. The intensity of an arc lamp is extremely high and, depending on the lamp, reasonably continuous throughout the region from 240 to 1200 nanometers. Usable intensities are available in the deep UV to 180 nm and in the near infrared to 2500 nm.

Unfortunately, most users of arc lamps are throwing away as much as 90% of the output, due to poor collection efficiency. A good lamp housing design will account for the radiation pattern of the arc lamp, and collect the majority of the lamp's output. But it doesn't stop there! Other considerations include: reflector stability, lamp ignition and power supply stability.

We believe that our long experience in light source design is what allows us to give you this unique light source: powerful—not through brute force but through efficient engineering, stable—constant output intensity, small—1/10 of comparable systems, environmentally friendly—ozone protected and inexpensive—volume production.

The compact high intensity light source includes: the lamp housing and adapter, regulated power supply and igniter; just select the desired focal length optics, lamp and window.

Lamp Housing

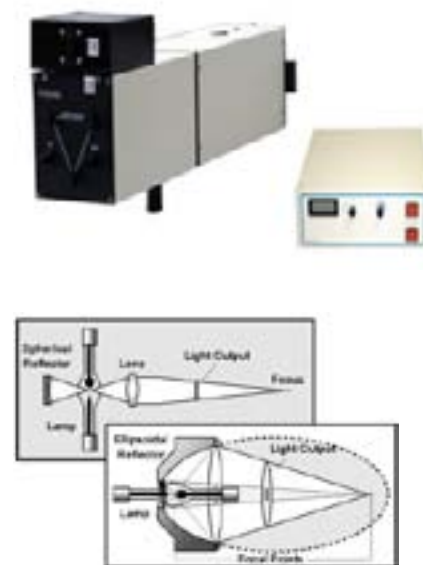


At the heart of virtually every OBB Light Source is a proprietary on-axis ellipsoidal reflector. Our reflectors collect up to 70% of the radiant energy from the arc lamp—vs 12% for typical condenser systems. The ellipse literally wraps around the arc lamp, collecting 5 to 6 times more output power than from a conventional system.

The arc source is located at one focus of the ellipse, and the radiation is reflected by the ellipse to the other focus. Since the light is brought to a focus by reflection rather than refraction (through a lens), there are less losses from absorption or lens-surface back-reflection. Since it collects light more efficiently, and focuses it more effectively, an OBB Lamp housing produces up to 11 times more power into a given smaller

area than a conventional design. This is critical whether illuminating light guides, monochromator slits, pinholes or other small areas.

What this means is simply that you get the same output with an OBB 75 W system as with a conventional 450 W system. You obviously will save money and space.



Our elliptical reflectors are proprietary in design and the coating used. They are NOT electro-formed reflectors, which can distort with heat, and can degrade within months. Our proprietary design ensures that distortion of the critical ellipsoid does not occur as the lamp reaches its operating temperature. This ensures thermal stability of focus. The coating ensures reasonably long operating life—typically 2–3 years.

While conventional lamp housings resemble chimneys emitting ozone and requiring cumbersome venting, the OBB compact high intensity light source has a sealed lamp housing that requires no ozone venting.

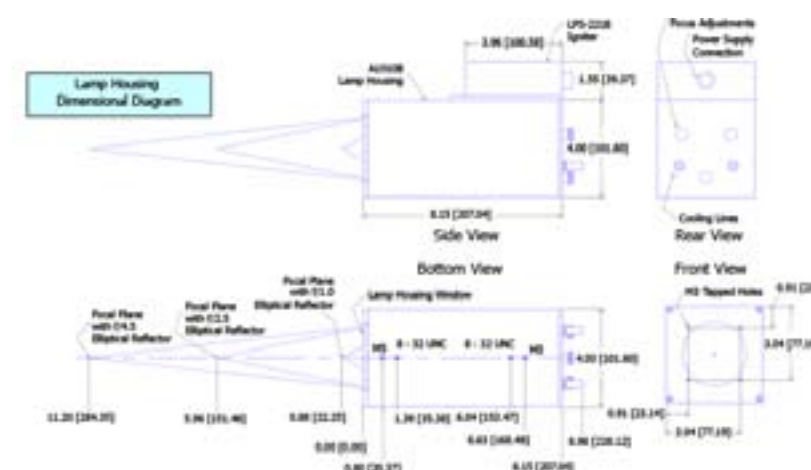
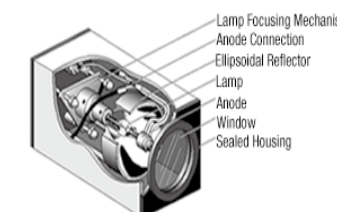
Ignition noise can disrupt, or even destroy, sensitive equipment in the vicinity of an Arc Lamp during start-up. This can be quite a concern in a crowded lab environment. OBB Engineers introduced an igniter that is integrated onto the lamp housing. This design provides an effective EMI shield which contains the EMI pulse, providing a safer and more convenient environment to do your research in.

The lamp housing includes an adaptor that will accommodate either a 75 W Xenon or 100 W Mercury lamp (OBB Corp specified or supplied). An optional 150 W Xenon lamp adaptor is also available.

What is not included but required are a: **reflector** (choice of three), **window** (choice of three) and **lamp**. Here you have choices depending on your requirements.

Specifications

Lamp power capacity	75 to 150 watts
Height	100 mm (3.9 inches)
Width	100 mm (3.9 inches)
Length	210 mm (8.3 inches)
Weight	1.9 kg (4.2 pounds)
Window Diameter (D)	65 mm



Note: There are M5 or 8/32 tapped holes on the bottom of the lamp housing to allow mounting of the housing to mounting posts.

Note: 75 W Xenon and 100 W Mercury lamps are air-convection cooled. There is no need for water cooling.

Power Supply

The lamp power supplies are highly-regulated DC units that provides very stable power for xenon and mercury lamps. Designed for use with various lamp housings, they may be used with lamp housings from other manufacturers.



For 75–150 W Xenon and 100 W Mercury Lamps

Specifications	
Input (user selectable)	105–120 V/60 Hz or 210–240 V/50 Hz
Power Rating	0 to 150 watts
Operating Voltage	10 to 24 volts
Operating Current	0 to 8 amps
Pre-Ignition Vvoltage	> 85 volts
Ripple at Max Current	< 10 milli-volts
Stability After Warm-up	0.2%
Line Vvoltage Regulation	0.1% current variation for 5 volts line change
Load Regulation	0.1% current variation for 50% change in load impedance
Dimensions	4.5 x 10.75 x 12.5 inches, 11.5 x 27.3 x 31.8 cm
Weight	12 pounds, 5.45 kg

Igniter

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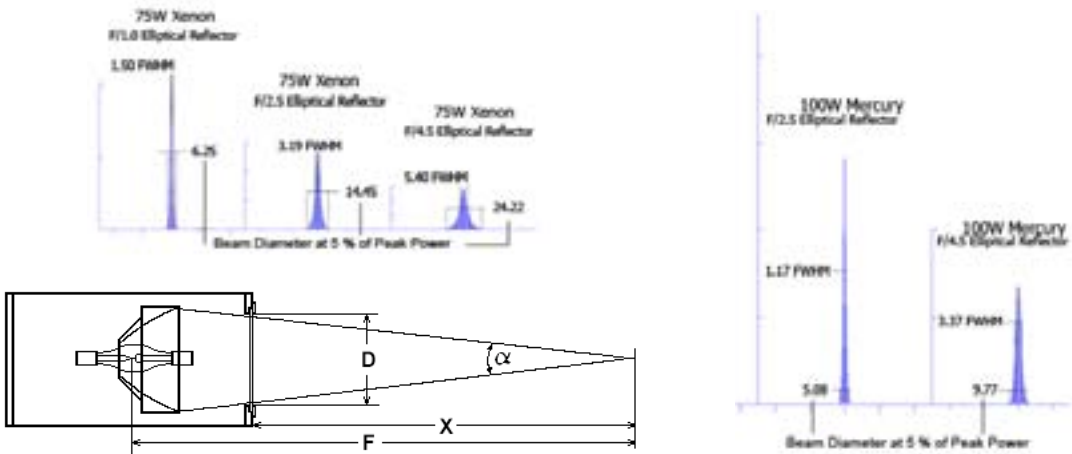
Igniter Dimensions	
Length	3.96 inches, 100.58 mm
Width	3.96 inches, 100.58 mm
Height	1.55 inches, 39.51 mm

Power Supply

You have a choice of three different reflectors. The proprietary reflectors OBB Corp uses allows for the great 70% collection efficiency. In addition to collection of light the reflectors are used as focusing elements. Hence the selection of a reflector determines the focal length. The different focal lengths correspond to the different “focal cones” of light coming from your lamp housing. This “focal cone” is variously referred to as f/#, Numerical Aperture, and/or acceptance, convergence, or divergence angle.

The f # is important when considering matching a light source to some other component, for example: fiber optics, liquid light guides or monochromators.

The spot size at the focus is directly related to the original arc size of the lamp and the focal length of the reflector. The larger the arc, or the longer the focal length, the larger the spot size at the focus. Hence if you want to have the maximum power in the smallest spot select the fastest focal length (f/1) and the smallest arc size lamp (100 W Mercury). This is another unique benefit of the OBB Corp’s system; we give you the most power in the smallest spot. No one using an arc lamp can match us in this regardless of their systems size or cost.



	f/4.5 reflector	f/2.5 reflector	f/1 reflector
Diameter (D) at exit opening	379 mm	240.5 mm	112 mm
Focal point from housing (X)	286 mm	152 mm	23 mm
Beam angle (α)	12.7 degrees	22.6 degrees	53.1 degrees

Lamp



You have a choice of lamps depending on the spectral output that you require. Of course you may order more than one of the lamps, they are interchangeable.

There are two types of arc lamps available—xenon and mercury. The xenon gas used in the lamp provides continuous spectra from 180 nm to 2,500 nm of course at varying intensity (refer to spectral output graph). The mercury provides a line spectra (refer to spectral graph). The spectral curves for xenon and mercury are normalized (relative intensities) therefore it is not obvious that the mercury lamps, intensity—where it emits, exceeds that of the xenon lamp. Because of the smaller arc size, the mercury lamp can also provide greater intensity in a smaller area (greater brightness) than the xenon lamp.

The normal envelope for most lamps is quartz—which generally cuts off the deep UV below 240 nm, but it also eliminates ozone. In case of our lamp housing, because it is sealed, ozone is not a safety hazard. Therefore in case where you require spectral output from 180 to 240 nm (for xenon lamps only), you can order a lamp with a suprasil envelope.

Lamp Wattage	Lamp Type	Nominal Arc Gap
75 watt	Compact Arc Xenon	0.8 mm
100 watt	Mercury	0.25 mm
75 watt	Suprasil Compact Arc Xenon	1.3 mm
150 watt	Compact Arc Xenon Ozone free	2.1 mm
150 watt	Compact Arc Xenon	2.1 mm

The standard system comes with an adaptor for 75 W xenon and 100 W mercury lamps (the adaptor is the same for both). If you desire to operate a 150 W xenon lamp you will need to get either an extra adaptor (if you plan to operate it in addition to the lower wattage lamps) or a substitute, 150W lamp adaptor in place of a 75 W one.

Although a 150 W xenon lamp has twice the power rating, it does not always mean that you will get twice the usable power. Because of the compact arc size of the 75 W xenon and 100 W mercury lamp they are much better point source (smaller arc size) and will provide much more power into a small area—like for example when you want to illuminate a narrow slit on a monochromator, or illuminate a small fiber optic element or liquid light guide.

If you want to illuminate small areas, typically 1 mm and below, the smaller wattage lamps provide you with more power in that area, than a 150 W lamp would. Obviously if you are interested in illuminating an area above 2 mm, the 150 W lamp will give you more power than a 75 W lamp.

If you want to collimate the output from the lamp, use the smaller lamps because they are point sources will give you better collimation.

The 150 W lamp, because of the sealed housing used will require water-cooling and there is provision on the lamp housing for water cooling. You can either get your water directly from the cold-water tap (can be a problem if the water is hard or when water is not available) or from an inexpensive circulating water bath option that we provide.

We have selected water-cooling over air: because it allows us to make a more compact housing; seal in the ozone and eliminates the need for venting.

Due to bulb geometry, the 150 W lamp will not work with f/1 or f/2.5 reflector.

Window

You have a choice of windows, depending on the lamp that you select and on the spectral output that you need. Please refer to the transmission spectra of the three types of windows available.

If you plan to use different types of lamps in your lamp housing, you may want to order different windows or select Suprasil since it will transmit all spectra.

Window	Wavelength	Graph (click on image to enlarge)
Pyrex	Above 350 nm	<p>Pyrex Transmission</p>
Quartz	Above 250 nm	<p>Quartz Transmission</p>
Suprasil	Above 180 nm	<p>Suprasil Transmission</p>

Accessories

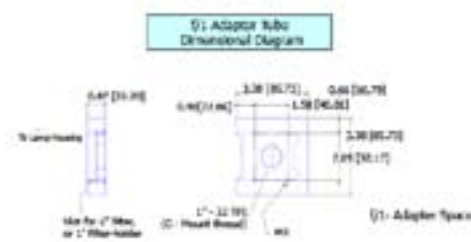
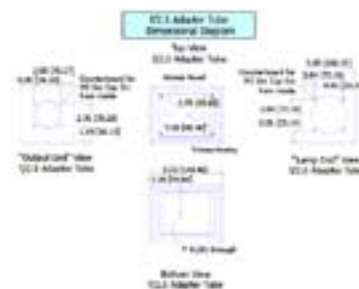
Light Shield

You have an option to select from three different adaptor tubes, that must correspond to the f- number of your reflector. The adaptor tubes attach as extensions to the lamp housing to shroud the beam and to provide mounting surfaces at the focal plane of the lamp.

F/1 Light shield for F/1 reflector

F/2.5 Light shield for F/2.5 reflector

F/4.5 Light shield for F/4.5 reflector



Note: There are M5 or 8/32 tapped holes on the bottom of the lamp housing to allow mounting of the housing to mounting posts.

KiloArc™

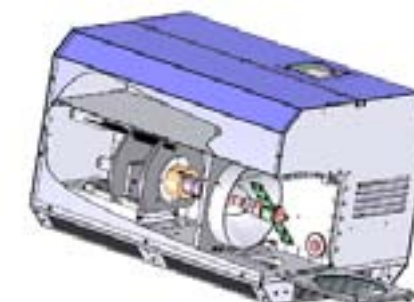
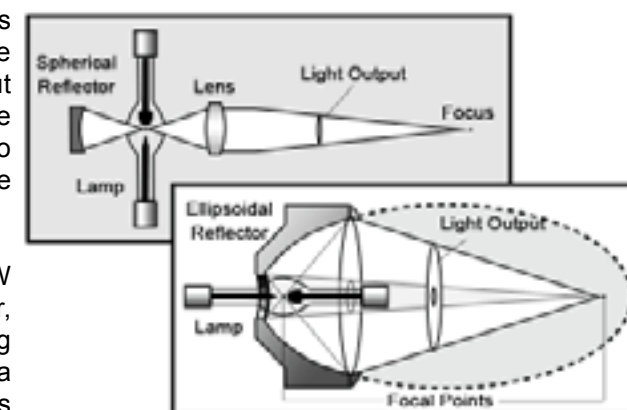
General

Our new KiloArc™ illumination system delivers the brilliance of 1,000 suns. Therefore if you are looking for more than 100 W's of optical output power in less than an 8 mm diameter area, the KiloArc™ is what you want as a light source. No one delivers more watts for the buck than the KiloArc™.

The KiloArc™ is a complete, integrated 1,000 W light source that includes power supply, starter, high efficiency collection optics and lamp housing in one compact package. One can use either a 1,000 W xenon or xenon-mercury lamp. Lamps are ease to change—no tools required. The system is air-cooled.

The KiloArc™ uses a high efficiency ellipsoidal reflector for collection, delivering 12 times more optical output power than from a system using conventional lenses for collection.

The KiloArc™ can be ordered manual or computer controlled versions.



Features and Benefits

- High efficiency collection optics – delivers maximum output power in small focused area, less than 8 mm diameter
- Compact integrated design – small foot print 0.375 meters width by 0.489 meters length
- Ozone free operation – venting is not a necessity, but an option
- High optical stability coupled with low optical noise – reliably delivering set power
- Available in two versions manual or computer controlled
- Pre-aligned bulb assemblies, no tools required – makes bulb change easy and safe
- Economical – the most watts for less

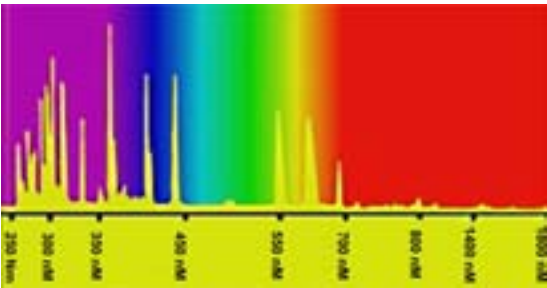
Lamp

You have a choice of two different pre-aligned assemblies including a cooling fin and a quick release self-aligning connector:

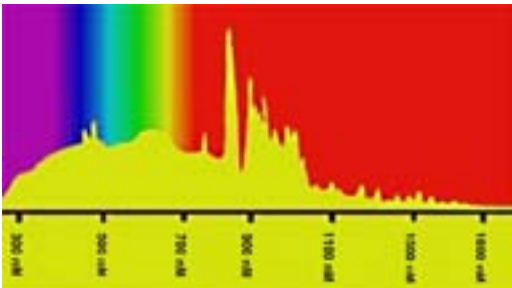
- 1000 watt Xenon short arc ozone free lamp
- 1000 watt Mercury/Xenon short arc ozone free lamp

Although the lamps are pre-aligned, we have made provision on the back of the system for x-y-z axis adjustment.

Typical lamp lifetime is 1,500 hrs. The lamp lifetime is highly dependent on operating conditions. Lamps should not be operated above their rated wattage (1,000 W).



Hg/Xe Spectrum



Xe Spectrum

Power Supply and Starter

The power supply is high efficiency switch-mode type design. It is rated at 1,200 watts to ensure that it is not operated at the limit of its range. This provides better stability and longer lifetime when operated at 1,000 W.

The starter provides a 45 KV pulse for reliable lamp ignition. There are triple shielding and electronic filtering to ensure that there is no RF transmitted or radiated to interfere with sensitive equipment, like computers.



Smart Features

There are two LED indicators on the back, one called the "STATUS" which shows the modes of operation: cool down, stand by, or error. The other is the ERROR indication. It senses problems and displays error codes when they occur.

Particular considerations were paid to safety. The lamp chamber and power supply are constantly monitored for heat, as well as the airflow for cooling—if there are problems the lamp will be shut down automatically and you will receive an appropriate error message. If the access door to lamp is loose or open the lamp will turn off, or not ignite.

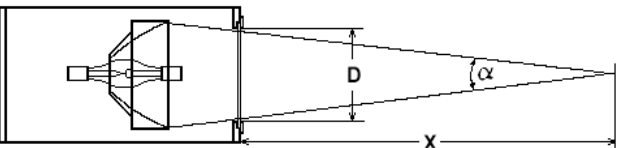
If you select the computerized version of KiloArc™ it will have USB 1.1 computer interface. You will be able to start and stop the lamp directly from your computer, control the power output from 800 to 1,200 W and be able to monitor the lamp lifetime. If the USB cable becomes unplugged the lamp will shut down.

We tried to make the operation as fool proof, safe and reliable as possible. Making the KiloArc™ ideal for commercial applications.

Specifications

Input	210–240 V AC 50/60 Hz
Starting	45 kV starting pulse
Power Rating	800–1200 watts (adjustable) — recommended 800–1000 watts
Lamp Module Type	1000 W Xenon, 1000 W Mercury/Xenon (proprietary to OBB)
Lamp Life	Typically 1,500 hrs
Focusing Optics	High efficiency f/4 ellipsoid reflector
Power Precision	0.04% (0.4 watts)
Output Volts Compliance	17–23 VDC
Output Current Limit	70 A rms
Height	329 mm (12.9inches)
Width	375 mm (14.8 inches)
Length	489 mm (19.3 inches)
Weight	31 kg (68 pounds)
Window Diameter (D)	127 mm (5.0 inches)
Center Beam Line Height (without feet)	128 mm (5.0 inches)
Spot Size	< 8 mm
Optical Power	> 100 W of broadband power at the focal spot with 1000 W Xenon bulb
Optical Stability	0.2%
Optical Noise (ripple)	< 1% RMS

Lamp Output



Lamp Output Diagram

f/4 reflector	
Diameter (D) at exit opening	111 mm (4.3 inches)
Focal point from housing (X)	444 mm (17.5 inches)
Beam angle (α)	17.5 degrees

Light Source Accessories

General

The modules and accessories are primarily designed for use with other OBB products. OBB Corp would be more than happy to design an O.E.M. product for your application.



Power Supply

The lamp power supplies are highly-regulated DC units that provides very stable power for xenon and mercury lamps. Designed for use with various lamp housings, they may be used with lamp housings from other manufacturers.



For 75–150 W Xenon and 100 W Mercury Lamps

Specifications

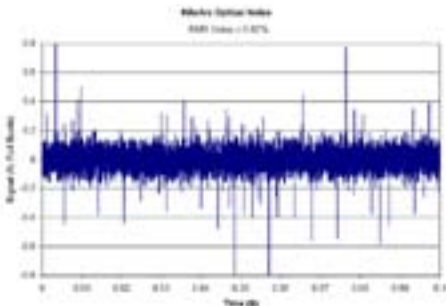
Input (user selectable)	105–120 V/60 Hz or 210–240 V/50 Hz
Power Rating	0 to 150 watts
Operating Voltage	10 to 24 volts
Operating Current	0 to 8 amps
Pre-Ignition Vvoltage	> 85 volts
Ripple at Max Current	< 10 milli-volts
Stability After Warm-up	0.2%
Line Vvoltage Regulation	0.1% current variation for 5 volts line change
Load Regulation	0.1% current variation for 50% change in load impedance
Dimensions	4.5 x 10.75 x 12.5 inches, 11.5 x 27.3 x 31.8 cm
Weight	12 pounds, 5.45 kg

Igniter

High-pressure arc lamps require an igniter that produces a high voltage pulse in order to start the lamp. Ignition noise can disrupt, or even destroy, sensitive equipment in the vicinity of an Arc Lamp during start-up. This can be quite a concern in a crowded lab environment. OBB Engineers introduced an igniter that is integrated onto the lamp housing. This design provides an effective EMI shield which contains the EMI pulse, providing a safer and more convenient environment to do your research in.

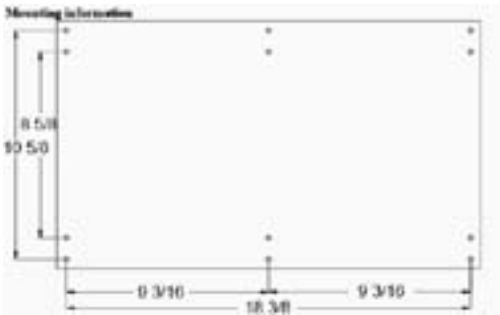
This design is specific to OBB Corp's own lamp housing, in fact the igniter piggybacks unto the housing. OBB Corp can however design custom made igniters for your O.E.M. need.

Optical Noise



Mounting Information

In case you wanted to mount the KiloArc™ the following are the mounting options on the base plate of the supply:



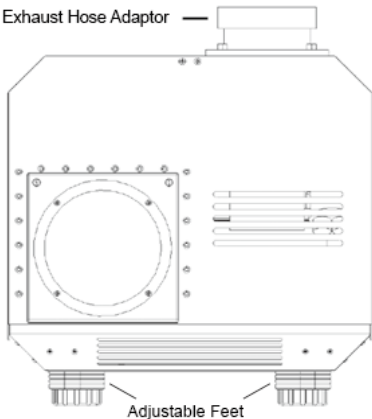
Options

Set of Feet

The KiloArc™ comes without feet on a level plate. In case you want to operate it on a surface that requires leveling, we can provide you with a set of four adjustable feet.

4-Inch Exhaust Hose Adaptor

The KiloArc™ does not generate harmful levels of ozone (less than a typical copier). It does generate some heat. Therefore venting is not a requirement. If you do desire to vent the exhaust from the KiloArc™, select this option.





Igniter Dimensions

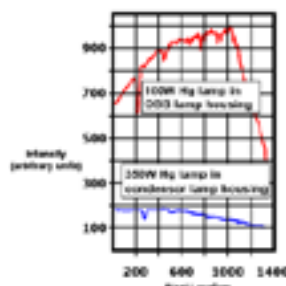
Length	3.96 inches, 100.58 mm
Width	3.96 inches, 100.58 mm
Height	1.55 inches, 39.51 mm

Lamp Housing

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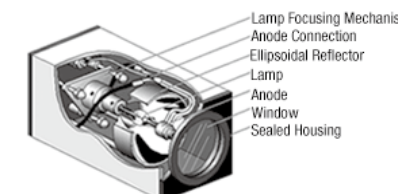
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What is not included but required are a: reflector (choice of three), window (choice of three) and lamp. Here you have choices depending on your requirements.

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Height	100 mm (3.9 inches)
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Weight	1.9 kg (4.2 pounds)
Window Diameter (D)	65 mm

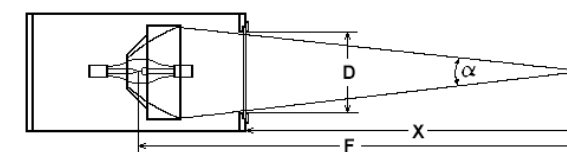


Reflector

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The f # is important when considering matching a light source to some other component, for example: fiber optics, liquid light guides or monochromators.

The spot size at the focus is directly related to the original arc size of the lamp and the focal length of the reflector. The larger the arc, or the longer the focal length, the larger the spot size at the focus. Hence if you want to have the maximum power in the smallest spot select the fastest focal length (f/1) and the smallest arc size lamp (100 W Mercury). This is another unique benefit of the OBB Corp's system; we give you the most power in the smallest spot. No one using an arc lamp can match us in this regardless of their systems size or cost.



	f/4.5 reflector	f/2.5 reflector	f/1 reflector
Diameter (D) at exit opening	379 mm	240.5 mm	112 mm
Focal point from housing (X)	286 mm	152 mm	23 mm
Beam angle (α)	12.7 degrees	22.6 degrees	53.1 degrees

Lamp



You have a choice of lamps depending on the spectral output that you require. Of course you may order more than one of the lamps, they are interchangeable.

There are two types of arc lamps available—xenon and mercury. The xenon gas used in the lamp provides continuous spectra from 180 nm to 2,500 nm of course at varying intensity (refer to spectral output graph). The mercury provides a line spectra (refer to spectral graph). The spectral curves for xenon and mercury are normalized (relative intensities) therefore it is not obvious that the mercury lamps, intensity—where it emits, exceeds that of the xenon lamp. Because of the smaller arc size, the mercury lamp can also provide greater intensity in a smaller area (greater brightness) than the xenon lamp.

The normal envelope for most lamps is quartz—which generally cuts off the deep UV below 240 nm, but it also eliminates ozone. In case of our lamp housing, because it is sealed, ozone is not a safety hazard. Therefore in case where you require spectral output from 180 to 240 nm (for xenon lamps only), you can order a lamp with a suprasil envelope.

Lamp Wattage	Lamp Type	Nominal Arc Gap
75 watt	Compact Arc Xenon	0.8 mm
100 watt	Mercury	0.25 mm
75 watt	Suprasil Compact Arc Xenon	1.3 mm
150 watt	Compact Arc Xenon Ozone free	2.1 mm
150 watt	Compact Arc Xenon	2.1 mm

The standard system comes with an adaptor for 75 W xenon and 100 W mercury lamps (the adaptor is the same for both). If you desire to operate a 150 W xenon lamp you will need to get either an extra adaptor (if you plan to operate it in addition to the lower wattage lamps) or a substitute, 150W lamp adaptor in place of a 75 W one.

Although a 150 W xenon lamp has twice the power rating, it does not always mean that you will get twice the usable power. Because of the compact arc size of the 75 W xenon and 100 W mercury lamp they are much better point source (smaller arc size) and will provide much more power into a small area—like for example when you want to illuminate a narrow slit on a monochromator, or illuminate a small fiber optic element or liquid light guide.

If you want to illuminate small areas, typically 1 mm and below, the smaller wattage lamps provide you with more power in that area, than a 150 W lamp would. Obviously if you are interested in illuminating an area above 2 mm, the 150 W lamp will give you more power than a 75 W lamp.

If you want to collimate the output from the lamp, use the smaller lamps because they are point sources will give you better collimation.

The 150 W lamp, because of the sealed housing used will require water-cooling and there is provision on the lamp housing for water cooling. You can either get your water directly from the cold-water tap (can be a problem if the water is hard or when water is not available) or from an inexpensive circulating water bath option that we provide.

We have selected water-cooling over air: because it allows us to make a more compact housing; seal in the ozone and eliminates the need for venting.

Due to bulb geometry, the 150 W lamp will not work with f/1 or f/2.5 reflector.

Lamp Adaptor

The lamp adaptor set consists of an anode adaptor and a cathode adaptor and provides the physical and electrical connection to the lamp in the lamp housing.



Window

Window	Wavelength	Graph (click on image to enlarge)
Pyrex	Above 350 nm	 Pyrex Transmission
Quartz	Above 250 nm	 Quartz Transmission
Suprasil	Above 180 nm	 Suprasil Transmission

Window Dimensions	
Diameter	70 mm
Width	3 mm
Window Aperture Dimensions	
Diameter	2.566 inches/ 65.18 mm