

An abstract, artistic photograph featuring a dark background with vibrant, glowing blue and white light patterns. The light forms curved, flowing shapes that resemble liquid or smoke, creating a sense of movement and depth. The colors transition from deep blue to bright white, with some areas showing a rainbow-like spectrum of colors. The overall effect is ethereal and futuristic.

LIGHT SOURCES

AND ACCESSORIES

ANDOVER CORPORATION

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INTRODUCTION TO LIGHT SOURCES

The modular design of our light sources allows the systems to be tailored to a variety of applications. Our knowledgeable staff can discuss your application and sample illumination requirements to determine the best light source configuration for your system.

When configuring a complete light source system, the following questions arise:

- What source type do I need (arc or halogen)?
- Which condenser optics should I use (lens material, F/number)?
- Is a rear reflector necessary?
- Will I need accessories?

The answers to these questions, along with a thorough understanding of the application, will determine the components needed to provide an effective solution for your light source requirements.

A word on safety

Arc Lamps:

When using arc lamps, you must have a condenser or window installed because of possible lamp burst. Even with low-powered sources, UV radiation and ozone are a concern. The easiest solution to the ozone problem is to use an ozone-free arc lamp if you do not need output below 260 nm. If that is not an option, vent the ozone. Take appropriate UV safety precautions; enclose the beam or wear UV protective eyewear and gloves. Our lamp housings include safety features to prevent lamp damage and accidental exposure. A door interlock prohibits the operation of the lamp while the door is open. Overheating of the lamp caused by a defect is avoided by a thermal interlock which shuts down the power supply.



Halogen Lamps:

Although small in comparison to arc lamps, tungsten halogen lamps still produce UV radiation. Especially in the high wattages, the UV radiation is hazardous. Always wear protective eyewear. Tungsten halogen lamps reach surface temperatures up to 900° C during operation. The cooling period can last up to 15 minutes; only then is it safe to touch the lamp.



BASICS

Choosing the right source

Several questions must be answered before choosing the right or best source for your application (all following discussions refer to incoherent light sources only operating by spontaneous emission).

The first one is:

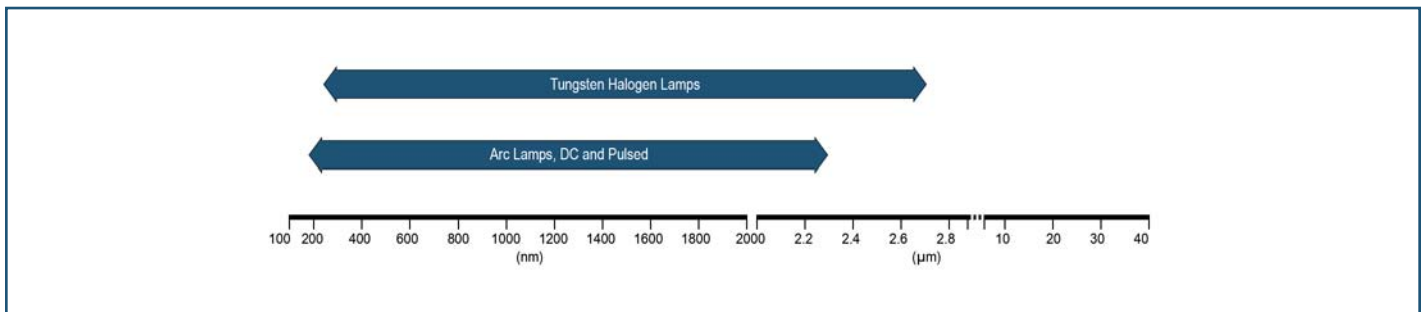
What wavelength range do I need? If you know the answer to this question, you can usually narrow the choices down to two or even one.

Below you will find the major advantages of each light source family.

We will talk about your application and help you make your final selection of the best source and necessary accessories.

You will find further help for choosing the right source on the following pages.

- Arc or halogen lamp? Pg. 4
- Lamp spectra and irradiance data Pg. 18



DC arc lamps: 200 to 2500 nm

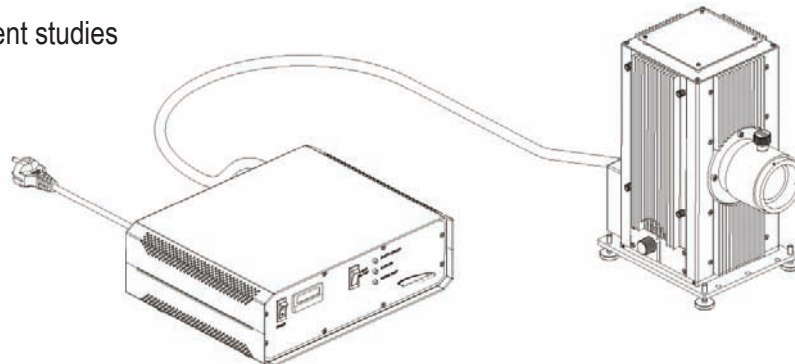
- Produce highest irradiance on small targets, because of high radiance arc
- Can produce intense collimated beams
- Intense UV output
- Can simulate solar spectrum

Pulsed Xe arc lamps: 180 to 2500 nm

- More UV
- High peak power
- μ s pulses for transient studies

Halogen lamps: 250 to 2700 nm

- Excellent stability
- Continuous spectrum
- Ideal for radiometric and photometric applications
- High total visible output
- Easy and inexpensive to operate
- Calibrated versions available



ARC OR HALOGEN LAMP?

Several important factors determine the best type and size of lamp for your application.

Spectral distribution

What wavelength do you need?

Which wavelengths will cause stray light or unwanted sample heating?

You should choose a lamp with high output in your spectral region and low output at wavelengths that may cause stray light or other problems. Arc lamps are primarily UV to VIS light sources. Mercury arc lamps have very strong peaks in the ultraviolet region.

Tungsten halogen lamps are a good choice for longwave VIS to NIR applications.

Radiance

How bright do you need the image to be?

How large is the area you are irradiating?

You will usually find one or more lenses between the source and the area to be illuminated (monochromator slit, fiber optic, detector, target). With lenses or any other kind of imaging you can change the irradiance on the detecting area, but not the radiance. You can't get an image that is brighter than the source.

If you have to pass the radiation through optical components, then radiance is important. Smaller sources are easier to collimate and therefore better to focus. If for example you would like to irradiate a slit, fiber or pinhole, i.e. if the area you are irradiating is of the same size or smaller than the source, then the radiance of the wavelength you need is important.

The irradiance curves divided by the source area give a first order comparison. For example, the radiance produced by a 75 W Xe lamp is 2.7 times higher than the radiance of a 150 W Xe lamp because the arc size is 8.8 times smaller.

Total output

How large is the area you are irradiating?

If the area you are irradiating is large, then in many cases total output is more important than radiance. The radiance of a 75 W Xe arc lamp is similar to that of a 1000 W Xe arc lamp, but if your target is an area of a few square cm, the 1000 W source will produce about 30 times the irradiance of the smaller lamp. In cases where you are using the raw lamp output, and collimation is not important, the irradiance curves are a good basis on which to choose the lamp.

Source size and shape

What is the target shape and size?

Available optics and the size and shape of the source determine how much you can get on target. An elongated source can be a better match to a slit target.

With non-imaging reflectors such as elliptical reflectors, the size, shape, and angle of the secondary image are more important than the primary arc or filament.

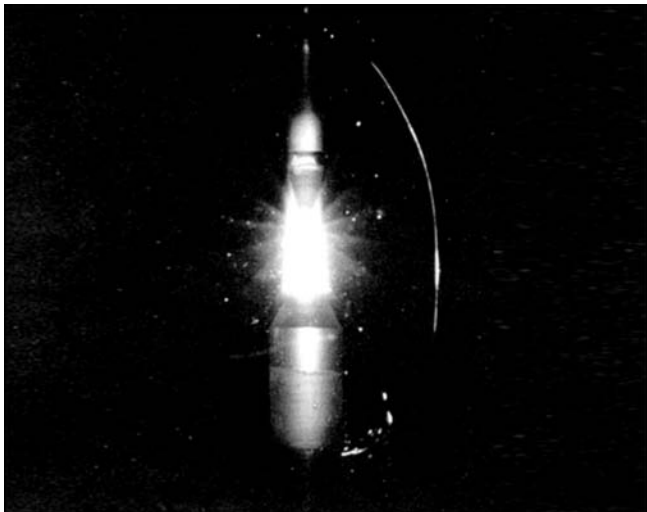
Source stability

How important is spatial and temporal stability to your application?

Spatial and temporal stability of source radiation is so important for some measurements that a double-beam design is standard. In general, tungsten halogen lamps are more stable than high-radiance arc lamps.

Optical feedback can improve long-term source stability but it is also important to use good design practice. For example, the convection currents inside an arc lamp lead to a lot of fluctuations on the low-radiance outer regions of the arc. A well-designed system will not use these unstable zones.

Arc Lamps



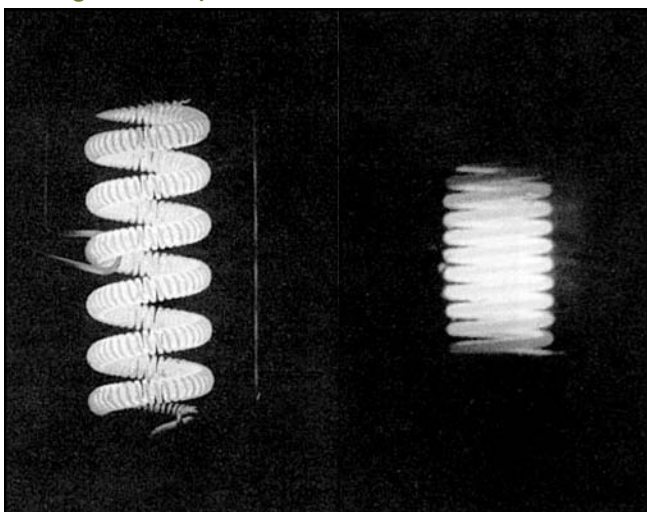
Features

- High radiance in the ultraviolet and visible; mercury lamps have spectral lines of very high irradiance in the ultraviolet
- High ultraviolet output
- Small concentrated arc
- Xe lamps have spectral distribution resembling the sun

Benefits

- Produce highest irradiance on small targets
- Intense collimated beams due to small, high radiance source
- Excellent sources for UV photochemistry
- Can simulate daylight

Halogen Lamps



Features

- High total visible output
- Excellent stability
- Excellent photometric or radiometric sources (250 - 2500 nm)
- Slow variation of output with wavelength

Benefits

- Easy-to-use
- Simplify detection in spectral scanning
- Less expensive than arc lamps

ARC LIGHT SOURCES

50 - 150 W Arc light source

- Designed for arc lamps
- Convection cooling
- Precision external lamp adjustments
- Choice of different UV-NIR condensing optics for collimated beam
- Supports wide range of accessories

Modular construction

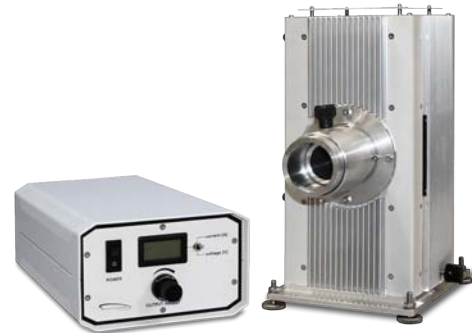
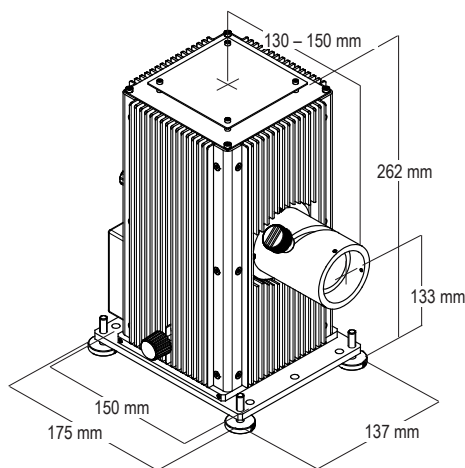
This housing was especially designed for arc lamps, but it operates other sources as well:

- Xe and Hg arc lamps up to 150 W
- Halogen lamps up to 150 W

Switching within the same lamp category requires only a new lamp adapter to position the lamp in the center of the housing.

Switching from one category to another, for example from arc lamps to halogen lamps, requires a simple change of interface to meet the different electrical requirements of the different lamp types. Arc lamps need two high-voltage connections. All interfaces include cables to connect to our power supplies.

Our lamp housings have height-adjustable feet which allow adjusting the optical axis by 15 mm. You can take the feet off and hard mount the housing to a bench, rail or optical table with the optic's axis centered over the hole pattern to allow for easy integration with the rest of your setup. The height of the optical axis is then 133 mm.



Convection cooling

Unlike fan-cooled housings, this housing uses natural convection cooling. This type of cooling is acoustically quiet and vibration free, which results in the most stable lamp output.

Openings in the bottom and top of the housing allow air to enter and circulate through the housing without excessive light leakage. The ribbed exterior improves the cooling efficiency.

Condensing optic

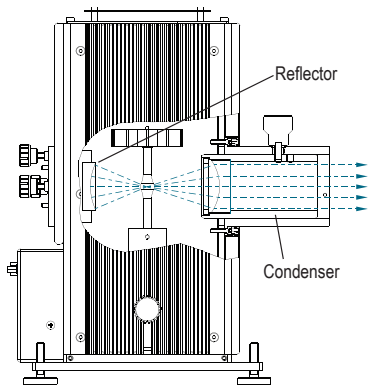
We offer a variety of different condensers with 35 mm aperture. They differ in:

- Lens material and therefore usable spectral range
- F/number and therefore beam quality and collection/collimation efficiency

The condensers are intended for collimated beams, but can also be positioned for compensating focal length change due to dispersion and to produce a more diverging or converging beam.

For best uniformity use a slightly diverging beam. For best quality images use the condenser as a collimator and a secondary focusing lens.

The condenser lenses are made of high-quality UV quartz for transmissions down to 200 nm, or optical borosilicate glass (BK7; B270) for applications, where an output below 360 nm is not required.



More light

The optional reflector assembly collects additional radiation from the source, thus increasing the output by up to 50% for arc lamps. You also get significantly more output with halogen lamps. Each reflector assembly includes a wideband AlMgF₂ coated mirror, usable from the UV to the IR. Control knobs provide x, y, and z adjustments for tilt and focus.

Lamp adjustment

The housing has precise external lamp adjusters. They let you place the arc where you want it. This is important for simplifying fiber and slit illumination. In many applications, this eliminates the need for readjusting any optics located in the beam path outside the housing.

Ordering Information

To build a complete light source you will need:
Lamp housing, condensing optics, lamp with appropriate adapter, electrical interface, cable and power supply. As an option, we suggest the rear reflector for more output.

Housing and Optics	
	Part Number
Housing	AC-LSH102
UV quartz condenser; F/1.3; 35 mm aperture	AC-LSC115
IR quartz condenser; F/1.3; 35 mm aperture	AC-LSC114
UV quartz condenser; F/1.0; 35 mm aperture	AC-LSC110
Glass condenser; F/1.0; 35 mm aperture	AC-LSC111
Glass condenser; F/1.3; 35 mm aperture	AC-LSC116
Rear reflector assembly	AC-LSC121

Arc Lamps and Adapters		
	Required Adapter	Part Number
50 W Hg arc lamp	AC-LSA120	AC-LSB605
100 W Hg arc lamp	AC-LSA121	AC-LSB610
100 W Hg(Xe) arc lamp	AC-LSA122	AC-LSB710
150 W Hg(Xe) arc lamp	AC-LSA123	AC-LSB711
75 W Xe arc lamp	AC-LSA122	AC-LSB510
75 W Xe OF arc lamp	AC-LSA122	AC-LSB511
100 W Xe OF arc lamp	AC-LSA122	AC-LSB512
150 W Xe arc lamp	AC-LSA123	AC-LSB520
150 W Xe OF arc lamp	AC-LSA123	AC-LSB521
150 W Xe UV arc lamp	AC-LSA123	AC-LSB522

Power Supplies and Interfaces	
	Part Number
Power supply for 50 - 150 W arc lamps	AC-LSN150
Power supply for 75 W Xe lamps	AC-LSN151
Power supply for 100 W Xe lamps	AC-LSN152
Power supply for 150 W Xe lamps	AC-LSN153
Power supply for 50 W Hg lamps	AC-LSN160
Power supply for 100 W Hg lamps (requires LSE142 Interface)	AC-LSN161
Power supply for 100 W Hg(Xe) lamps	AC-LSN171
Interface for arc lamps	AC-LSE140
Interface for 50/100 W Hg lamps	AC-LSE142
Cable Xe	AC-LSE143
Cable Hg	AC-LSE144

ARC LIGHT SOURCES

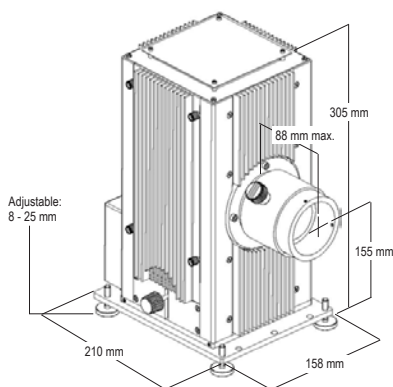
200 - 500 W Xe, Hg(Xe), and Hg Arc light source

- Modular: operates Xe,- Hg and Hg(Xe) arc lamps
- Temperature-controlled cooling fan for most efficient lamp operation
- External lamp and rear reflector adjusters
- Choice of different condensing optics for collimated output beams in the UV-NIR
- Supports wide range of accessories

Our 200 - 500 W arc lamp housing is much more than just a safe enclosure for the lamp. It operates different Xe, Hg and Hg(Xe) lamps under optimal (and for these lamps necessary) conditions. The housing holds the ignitor, collecting and collimating optics, rear reflector, cooling fan, external lamp and reflector adjusters and all the necessary electronics.

Switching between different arc lamps requires changing the lamp adapter to position the lamp in the center of the housing and a change of the electrical interface and power supply. The interface includes the ignitor and provides the electrical connection to the lamp. It mounts to the rear of the housing. With the broad range of accessories which mostly attach directly to the condenser output, our sources prove to be good equipment in the laboratories of research and industry and are also a good choice for specific applications in production control.

Our lamp housings have height-adjustable feet which allow adjusting the optical axis by 15 mm. You can take the feet off and hard mount the housing to a bench, rail or optical table with the optic's axis centered over the hole pattern to allow for easy integration with the rest of your setup. The height of the optical axis is then 155 mm.



Condensing optics

We offer different types of condensing lens assemblies. They differ in:

- Lens material and therefore usable spectral range
- F/number and therefore beam quality and collection/collimation efficiency.

All condensers are intended for collimated beams, but can also be positioned for compensating focal length change due to dispersion and to produce a diverging or converging beam. The glass condensers do not transmit below 350 nm. If you need UV output, choose a quartz condenser.

For best uniformity use a slightly diverging beam. For best quality images use the condenser as a collimator and a secondary focusing lens. In this case choose a condenser with high F/number.

Lamp and reflector adjusters

A spherical reflector collects the output from the rear of the lamp and focuses it on or near the arc, for collection by the condenser. The output is increased by as much as 60%.

The lamp and reflector adjusters are located on the outside of the housing. They let you precisely position the arc and its image for maximum collection, and allow you to place the arc where you want it. This eliminates the need to readjust any optics that are in the beam after it leaves the housing.

Power supply

The power supplies are reliable current sources for our Xe and Hg(Xe) lamps as well as reliable power sources for the Hg lamps. DC Mercury lamps must be operated under power control while DC Xe and Hg(Xe) lamps are operated under current control. Our power supplies are easy to use. The Xe and Hg(Xe) power supplies have an output pre-adjust switch that, when depressed, causes the meter to display lamp current setting prior to lamp ignition. The Hg power supplies have a three-position lamp select switch that sets the internal circuitry of the supply to operate 200, 350, or 500 W Hg lamps.

Cooling

Proper cooling is essential for correct lamp operation. The bulb temperature of arc lamps should not exceed 600 - 900° C, because at higher temperatures the bulb is not able to withstand the high gas pressure due to a temperature-related change of the quartz structure (re-crystallization). Because of potential current conductor oxidation, the socket temperature must not exceed 230° C. Lamps of 200 W and higher require forced cooling of the base connection parts and bulb cooling is necessary for lamps of even higher wattage. Airflow on only one side of the bulb must be avoided because it generates additional stress in the quartz glass and unbalances the inner convection symmetry, resulting in turbulence. As a consequence the arc becomes unstable. Stress in the quartz glass also results in a risk of lamp burst. Therefore our lamp housings provide baffled airflow. Excessive cooling should also be avoided because it also provides increased arc instability due to turbulences in the bulb. Our lamp housings have a built-in temperature sensor measuring the actual lamp socket temperature and a fan speed control circuit. The fan speed adjusts accordingly. This ensures an optimal operation of the lamp.

Ordering Information

To build a complete light source you will need: Lamp housing, condensing optics, lamp with appropriate adapter, electrical interface, cable and power supply. As an option, we suggest the rear reflector for more output.

Housing and Optics	
	Part Number
200 – 500 W lamp housing, without optics	AC-LSH302
Adapter for 35 mm condenser optic	AC-LSA300
UV quartz condenser; F/1.3; 35 mm aperture	AC-LSC215
UV quartz condenser; F/1.0; 35 mm aperture	AC-LSC210
IR quartz condenser; F/1.3; 35 mm aperture	AC-LSC214
Glass condenser; F/1.3; 35 mm aperture	AC-LSC216
UV quartz condenser; F/1.3; 50 mm aperture	AC-LSC315
UV quartz condenser; F/1.0; 50 mm aperture	AC-LSC310
IR quartz condenser; F/1.0; 50 mm aperture	AC-LSC314
Glass condenser; F/1.0; 50 mm aperture	AC-LSC311
Rear reflector assembly	AC-LSC321

Arc Lamps and Adapters		
	Required Adapter	Part Number
300 W Xe OF arc lamp	AC-LSA353	AC-LSB530
300 W Xe arc lamp	AC-LSA353	AC-LSB531
200 W Hg arc lamp	AC-LSA362	AC-LSB620
350 W Hg arc lamp	AC-LSA363	AC-LSB630
500 W Hg arc lamp	AC-LSA364	AC-LSB640
200 W Hg (Xe) arc lamp	AC-LSA370	AC-LSB720
200 W Hg (Xe) OF arc lamp	AC-LSA370	AC-LSB721
350 W Hg(Xe) arc lamp	AC-LSA371	AC-LSB730
500 W Hg(Xe) arc lamp	AC-LSA372	AC-LSB740

Power Supplies and Interfaces	
	Part Number
Power supplies for 300 W Xe lamps	AC-LSN251/2
Power supply for 200 W Hg lamps	AC-LSN261
Power supply for 200 - 500 W Hg lamps	AC-LSN265
Power supply for 200 W Hg(Xe) lamps	AC-LSN271
Power supply for 350 - 1000 W Hg(Xe) lamps	AC-LSN575
Interface for 200 W Hg(Xe) lamps with LSN271 power supply	AC-LSE139
Interface for 200 W Hg lamps with LSN261 power supply	AC-LSE141
Interface for 300 - 500 W arc lamps	AC-LSE340
Cable Xe and Hg(Xe)	AC-LSE350
Cable Hg	AC-LSE351
Cable for operating LSH302 with LSN575 power supply	AC-LSE352

ARC LIGHT SOURCES

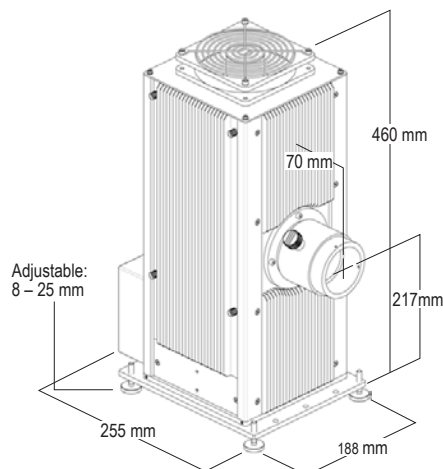
500 - 1000 W Arc light source

- Modular: operates Xe, Hg and Hg(Xe) arc lamps
- Temperature-controlled cooling fan for most efficient lamp operation
- External lamp and rear reflector adjusters
- Choice of different condensing optics for collimated output beams in the UV-NIR
- Supports wide range of accessories

Our 1000 W lamp housing is much more than just a safe enclosure for the lamp. It operates different Xe, Hg and Hg(Xe) lamps under optimal and for these lamps necessary conditions. The housing holds the ignitor, collecting and collimating optics, rear reflector, cooling fan, external lamp and reflector adjusters and all the necessary electronics.

Switching between different arc lamps only requires changing the lamp adapter to position the lamp in the center of the housing. With the broad range of accessories which mostly attach directly to the condenser output, our sources prove to be good standard equipment in the laboratories of research and industry.

Our lamp housings have height-adjustable feet which allow adjusting the optical axis by 15 mm. You can take the feet off and hard mount the housing to a bench, rail or optical table with the optic's axis centered over the hole pattern to allow for easy integration with the rest of your setup. The height of the optical axis is then 217 mm.



Condensing optics

We offer different types of condensing lens assemblies. They differ in:

- Lens material and therefore usable spectral range
- F/number and therefore beam quality and collection/collimation efficiency.

All condensers are intended for collimated beams, but can also be positioned for compensating focal length change due to dispersion and to produce a diverging or converging beam. The glass condensers do not transmit below 350 nm. If you need UV output, choose a quartz condenser.

For best uniformity, use a slightly diverging beam. For best quality images use the condenser as a collimator and a secondary focusing lens. In this case choose a condenser with high F/number.

Lamp and reflector adjusters

A spherical reflector collects the output from the rear of the lamp and focuses it on or near the arc for collection by the condenser. Output is increased by as much as 50%. The lamp and reflector adjusters are located on the outside of the housing. They let you precisely position the arc and its image for maximum collection and allow you to place the arc where you want it. This eliminates the need to readjust any optics that are in the beam after it leaves the housing.

Cooling

The bulb temperature of arc lamps should not exceed 600 - 900 °C, because at higher temperature the bulb is not able to withstand the high gas pressure due to a temperature-related change of the quartz structure (recrystallization). Because of potential current conductor oxidation, the socket temperature must not exceed 230 °C. Lamps of 200 W and higher require forced cooling of the base connection parts and bulb cooling is necessary for lamps of even higher wattage.

Proper cooling is essential for correct lamp operation. Airflow on only one side of the bulb must be avoided because it generates additional stress in the quartz glass and unbalances the inner convection symmetry, resulting in turbulence. As a consequence the arc becomes unstable. Stress in the quartz glass also results in a risk of lamp burst. Therefore our lamp housings provide baffled airflow. Excessive cooling should also be avoided because it also provides increased arc instability due to turbulences in the bulb.

Mercury arc lamps are very sensitive to the temperature of the cooling air stream across the bulb. The lamp current and voltage change as the bulb temperature is changed. The cooling fan should not run before the lamp has been started. Our lamp housings have a built-in temperature sensor and fan speed control circuit. This ensures an optimal operation of any lamp over significant swings in ambient temperature. The fan will only start running after start-up has finished.

Ordering Information

To build a complete light source you will need: Lamp housing, condensing optics, lamp with appropriate adapter, electrical interface, cable and power supply. As an option, we suggest the rear reflector for more output.

Housing and Optics	
	Part Number
450 - 1000 W lamp housing	AC-LSH601
UV quartz condenser; F/1,3; 50 mm aperture	AC-LSC315
UV quartz condenser; F/1,0; 50 mm aperture	AC-LSC510
Glass condenser; F/1,0; 50 mm aperture	AC-LSC511
Rear reflector assembly	AC-LSC621

Arc Lamps and Adapters		
	Required Adapter	Part Number
450 W Xe arc lamp	AC-LSA654	AC-LSB540
450 W Xe UV arc lamp	AC-LSA654	AC-LSB541
450 W Xe OF arc lamp	AC-LSA654	AC-LSB542
1000 W Xe arc lamp	AC-LSA655	AC-LSB550
1000 W Xe OF arc lamp	AC-LSA655	AC-LSB551
1000 W Hg(Xe) arc lamp	AC-LSA655	AC-LSB750
1000 W Hg(Xe) OF arc lamp	AC-LSA655	AC-LSB751

Power Supplies and Interfaces	
	Part Number
Power supply for 450 - 1000 W Xe arc lamps	AC-LSN555
Power supply for 350 - 1000 W Hg(Xe) arc lamps	AC-LSN575
Interface for arc lamps	AC-LSE640
Cable set for Xe, Hg lamps	AC-LSE652

HALOGEN LIGHT SOURCES

10 - 150 W Halogen source

- Stable VIS-NIR sources
- Convection cooling
- Precision external lamp adjustments
- Choice of different UV-NIR condensing optics for collimated beam
- Supports wide range of accessories

Modular construction

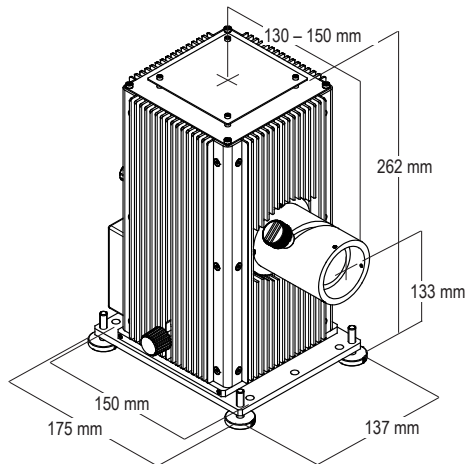
This housing was especially designed for arc lamps. But it also operates other sources like:

- Halogen lamps up to 150 W

Switching within the same lamp category requires only a new lamp adapter to position the lamp in the center of the housing.

Switching from one category to another, for example from arc lamps to halogen lamps, requires a simple change of interface to meet the different electrical requirements of the different lamp types. Halogen lamps need two voltage connections. All interfaces include cables to connect to the appropriate power supplies.

Our lamp housings have height-adjustable feet which allow adjusting the optical axis by 15 mm. You can take the feet off and hard mount the housing to a bench, rail or optical table with the optics axis centered over the hole pattern to allow for easy integration with the rest of your setup. The height of the optical axis is then 133 mm.



Convection cooling

Unlike fan cooled housings, this housing uses natural convection cooling. This type of cooling is acoustically quiet and vibration free, which results in the most stable lamp output.

Openings in the bottom and top of the housing allow air to enter and circulate through the housing without excessive light leakage. The ribbed exterior improves cooling efficiency.

Condensing optic

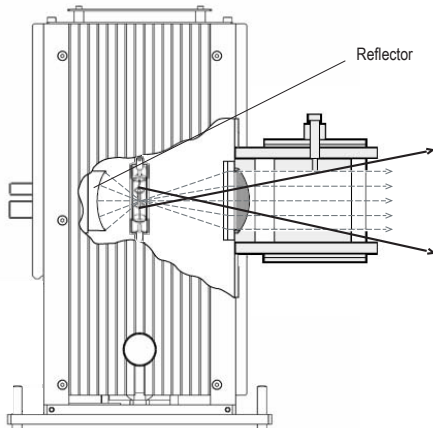
We offer a variety of different condensers with 35 mm aperture. They differ in:

- Lens material and therefore usable spectral range
- F/number and therefore beam quality and collection/collimation efficiency

The condensers are intended for collimated beams, but can also be positioned for compensating focal length change due to dispersion and for producing a more diverging or converging beam.

For best uniformity use a slightly diverging beam. For best quality images use the condenser as a collimator and a secondary focusing lens.

The condenser lenses are made of high-quality UV quartz for transmission down to 200 nm, or optical borosilicate glass (BK7; B270) for applications, where output below 360 nm is not required.



Reflector

The optional reflector assembly collects additional radiation from the lamp. Lamp and mirror must be adjusted to each other so that the image of the filament lies beside the actual filament (see fig. above). Reproducing an image of the filament on itself must be avoided as it would lead to overheating of the filament, increased vaporization and shorter lamp life.

Lamp adjustment

The housing has precise external lamp adjusters. They let you place the filament where it is needed. This is important for simplifying fiber and slit illumination. In many applications this eliminates the need for readjusting any optics located in the beam path outside the housing.

Power supply

The power supply is a highly regulated constant current source specifically designed for 10 - 150 W halogen lamps. It uses a digital meter to ensure repeatable current or voltage settings. This supply includes a circuitry that gradually applies power on start-up. This prevents lamp damage from in-rush current. The reduction in thermal shock to calibrated lamps ensures longer validity of the calibration.

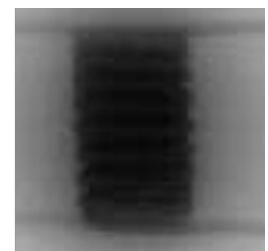
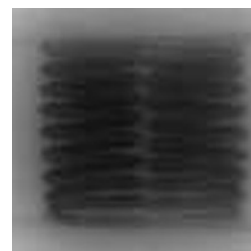
Ordering Information

To build a complete light source you will need: Lamp housing, condensing optics, lamp with appropriate adapter, electrical interface, cable and power supply. As an option, we suggest the rear reflector for more output.

Housing and Optics	
	Part Number
Housing	AC-LSH102
UV quartz condenser, F/1.3; 35 mm aperture	AC-LSC115
UV quartz condenser, F/1.0; 35 mm aperture	AC-LSC110
IR quartz condenser, F/1.3; 35 mm aperture	AC-LSC114
Glass condenser, F/1.3; 35 mm aperture	AC-LSC116
Glass condenser, F/1.0; 35 mm aperture	AC-LSC111
Rear reflector assembly	AC-LSC121

Halogen Lamps and Adapters		
	Required Adapter	Part Number
10 W halogen lamp	AC-LSA130	AC-LSB110/5
20 W halogen lamp	AC-LSA130	AC-LSB111/5
50 W halogen lamp	AC-LSA132	AC-LSB114/5
100 W halogen lamp	AC-LSA132	AC-LSB117/5
100 W, long life halogen lamp	AC-LSA132	AC-LSB116/5
150 W halogen lamp	AC-LSA132	AC-LSB121/5

Power Supplies and Interfaces	
	Part Number
Power supply for halogen lamps up to 150 W	AC-LSN111
Interface for halogen lamps	AC-LSE120



HALOGEN LIGHT SOURCES

200 - 400 W Halogen source

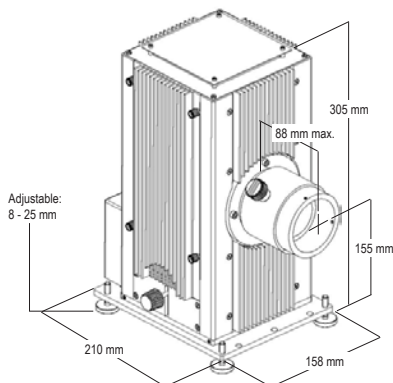
- Stable VIS-NIR source
- Fan cooling
- Precision external lamp adjustments
- Choice of different UV-NIR condensing optics for collimated beam
- Supports wide range of accessories

Lamp housing construction

This housing was especially designed for 200 - 500 W arc lamps. But it also operates halogen lamps in the 200 - 400 W range.

Halogen lamps need two voltage connections. An interface mounted to the rear of the housing provides electrical requirements to the lamp and includes the cables for connection to the appropriate power supplies.

Our lamp housings have height-adjustable feet which allow adjusting the optical axis by 15 mm. You can take the feet off and hard mount the housing to a bench, rail or optical table with the optics axis centered over the hole pattern to allow for easy integration with the rest of your setup. The height of the optical axis is then 155 mm.



Cooling

Tungsten halogen lamps can reach temperatures up to 900° C (surface temperature) during operation. They require a safe, temperature-controlled environment. Below 200° C the halogen cycle does not work any more. There is also a maximum permitted pinch temperature which must not in any case be exceeded during operation. The housing has a cooling fan built in that provides the proper airflow.

Condensing optic

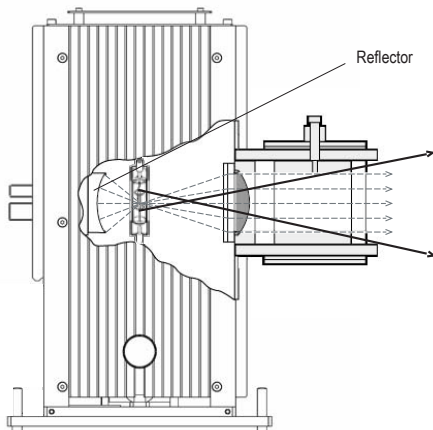
We offer a choice of several condensers with 35 mm or 50 mm apertures; they differ in:

- size (35 or 50 mm beam diameter)
- Lens material and therefore usable spectral range
- F/number and therefore beam quality and collection/collimation efficiency

The condensers are intended for collimated beams, but can also be positioned for compensating focal length change due to dispersion and for producing a more diverging or converging beam.

For best uniformity use a slightly diverging beam. For best quality images use the condenser as a collimator and a secondary focusing lens.

The condenser lenses are made of high-quality UV quartz for transmission down to 200 nm, or optical borosilicate glass (BK7; B270) for applications where output below 360 nm is not required.



Reflector

The optional reflector assembly collects additional radiation from the lamp. Lamp and mirror must be adjusted to each other so that the image of the filament lies beside the actual filament (see fig. above). Reproducing an image of the filament on itself must be avoided as it would lead to overheating of the filament, increased vaporization and shorter lamp life.

Lamp adjustment

The housing has precise external lamp adjusters. They let you place the filament where it is needed. This is important while simplifying optical adjustments. In many applications this eliminates the need for readjusting any optics located in the beam after it leaves the housing.

Power supply

The power supply is a highly regulated constant current or constant voltage source. It uses a digital meter to ensure repeatable current or voltage settings. Actually the device is a laboratory power supply providing 0 - 16 A output current and 0 - 60 VDC output voltage. It has no soft-start option, but by gradually increasing the lamp current or voltage to its operating level, it ensures proper lamp operation.

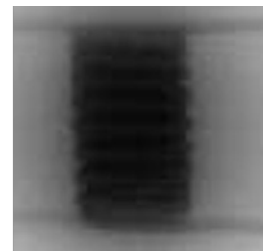
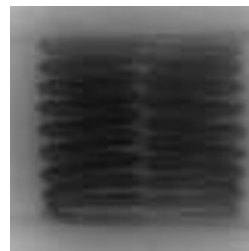
Ordering Information

To build a complete light source you will need: Lamp housing, condensing optics, lamp with appropriate adapter, electrical interface, cable and power supply. As an option, we suggest the rear reflector for more output.

Housing and Optics	
	Part Number
200 - 500 W lamp housing, without optics	AC-LSH302
Adapter for 35 mm condenser optics	AC-LSA300
UV quartz condenser; F/1.3; 35 mm aperture	AC-LSC215
UV quartz condenser; F/1.0; 35 mm aperture	AC-LSC210
IR quartz condenser; F/1.3; 35 mm aperture	AC-LSC214
Glass condenser; F/1.3; 35 mm aperture	AC-LSC216
UV quartz condenser; F/1.3; 50 mm aperture	AC-LSC315
UV quartz condenser; F/1.0; 50 mm aperture	AC-LSC310
Glass condenser; F/1.0; 50 mm aperture	AC-LSC311
Rear reflector assembly	AC-LSC321

Halogen Lamps and Adapters		
	Required Adapter	Part Number
250 W halogen lamp	AC-LSA333	AC-LSB123/5
300 W halogen lamp	AC-LSA333	AC-LSB124/2
400 W halogen lamp	AC-LSA333	AC-LSB125/2

Power Supplies and Interfaces	
	Part Number
Power supply for halogen lamps up to 400 W	AC-LSN6016
Interface for halogen lamps	AC-LSE320



HALOGEN LIGHT SOURCES

600 - 1000 W Halogen source

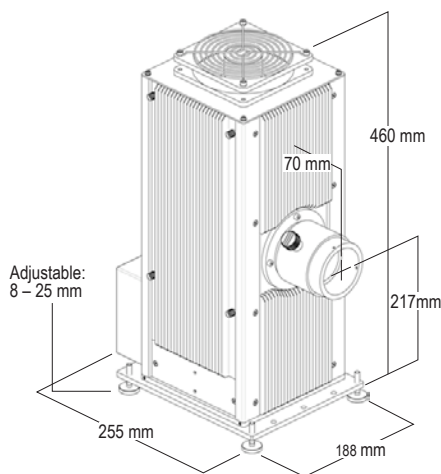
- Stable, high output VIS-NIR source
- Choice of different UV-NIR condensing optics for collimated beam
- Supports wide range of accessories

Lamp housing construction

This housing was especially designed for 500 - 1000 W arc lamps. But it also operates halogen lamps in the 600 - 1000 W range.

Halogen lamps need two voltage connections. An interface mounted to the rear of the housing provides electrical requirements to the lamp and includes the cables for connection to the appropriate power supply.

Our lamp housings have height-adjustable feet which allow adjusting the optical axis by 15 mm. You can take the feet off and hard-mount the housing to a bench, rail or optical table with the optics axis centered over the hole pattern to allow for easy integration with the rest of your setup. The height of the optical axis is then 217 mm.



Cooling

Tungsten halogen lamps reach up to 900° C (surface temperature) during operation. They require a safe, temperature-controlled environment. Below 200° C the halogen cycle stops working. There is also a maximum permitted pinch temperature which must never be exceeded during operation. The housing has a built-in cooling fan providing the proper airflow.

Condensing optic

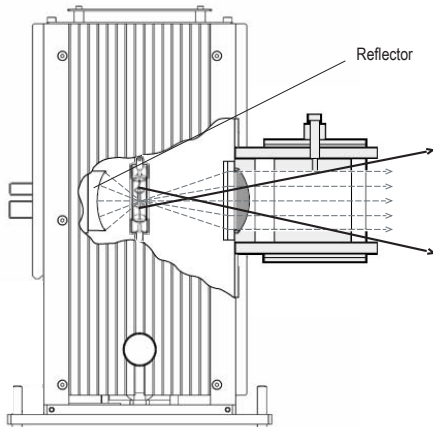
We offer a variety of several condensers with 50 mm aperture; they differ in:

- Lens material and therefore usable spectral range
- F/number and therefore beam quality and collection/collimation efficiency

The condensers are intended for collimated beams, but can also be positioned for compensating focal length change due to dispersion and to produce a more diverging or converging beam.

For best uniformity use a slightly diverging beam. For best quality images use the condenser as a collimator and a secondary focusing lens.

The condenser lenses are made of high quality UV quartz for transmission down to 200 nm, or optical borosilicate glass (BK7; B270) for applications where an output below 360 nm is not required.



Reflector

The optical reflector assembly collects additional radiation from the lamp. Lamp and mirror must be adjusted to each other so that the image of the filament lies beside the actual filament (see fig. above).

Reproduction of an image of the filament on itself must be avoided as it would lead to overheating of the filament, increased vaporization and shorter lamp life.

Lamp adjustment

The housing has precise external lamp adjusters. They allow placing the filament where it is needed. This is important for simplifying optical adjustments. In many applications this eliminates the need for readjusting any optics sitting in the beam after it leaves the housing.

Power supply

The power supply is a highly regulated constant voltage source. It provides 120 VDC output voltage for the 600 or 1000 W halogen lamp. As a feature it provides “soft-start” to the lamp. This prevents the lamp from being overpowered during the warm-up phase and insures longer lamp life.

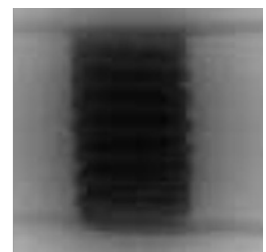
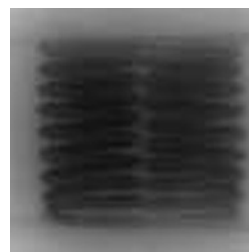
Ordering Information

To build a complete light source you will need: Lamp housing, condensing optics, lamp with appropriate adapter, electrical interface, cable and power supply. As an option, we suggest the rear reflector for more output.

Housing and Optics	
	Part Number
600 - 1000 W lamp housing, without optics	AC-LSH601
UV quartz condenser; F/1.3; 50 mm aperture	AC-LSC315
UV quartz condenser; F/1.0; 50 mm aperture	AC-LSC510
Glass condenser; F/1.0; 50 mm aperture	AC-LSC511
Rear reflector assembly	AC-LSC621

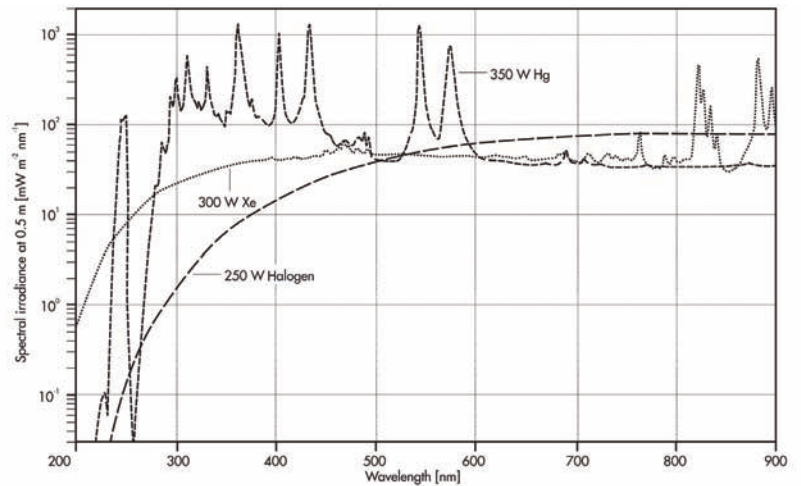
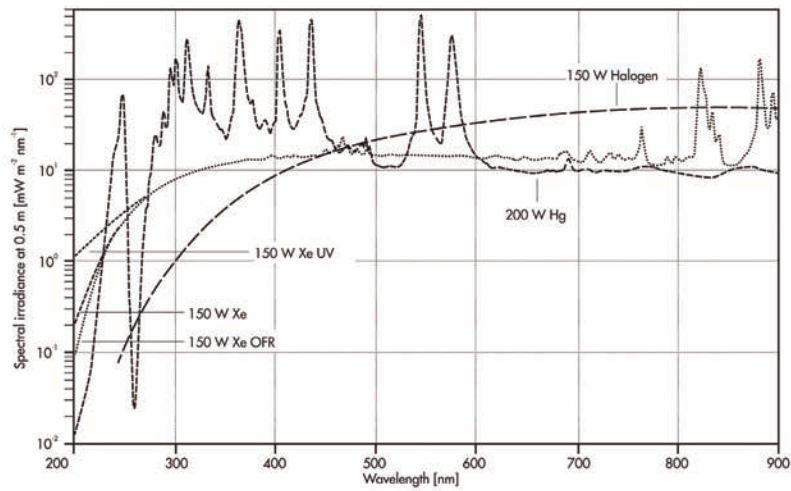
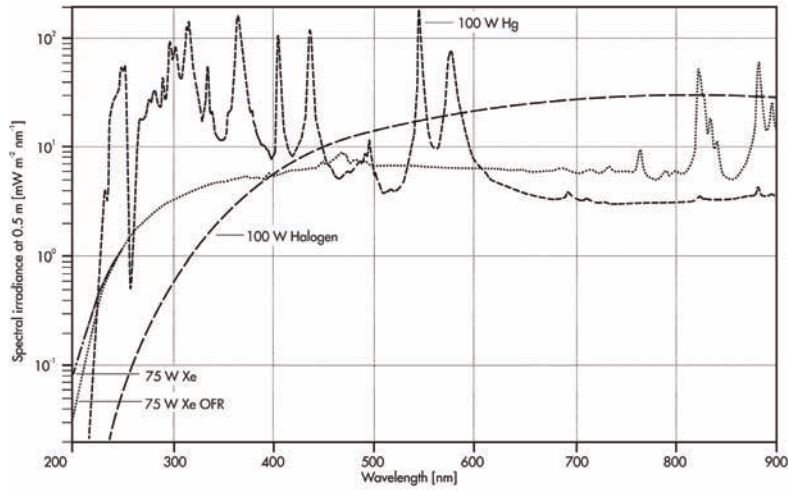
Halogen Lamps and Adapters		
	Required Adapter	Part Number
600 W halogen lamp	AC-LSA631	AC-LSB126/2
1000 W halogen lamp	AC-LSA631	AC-LSB127/2

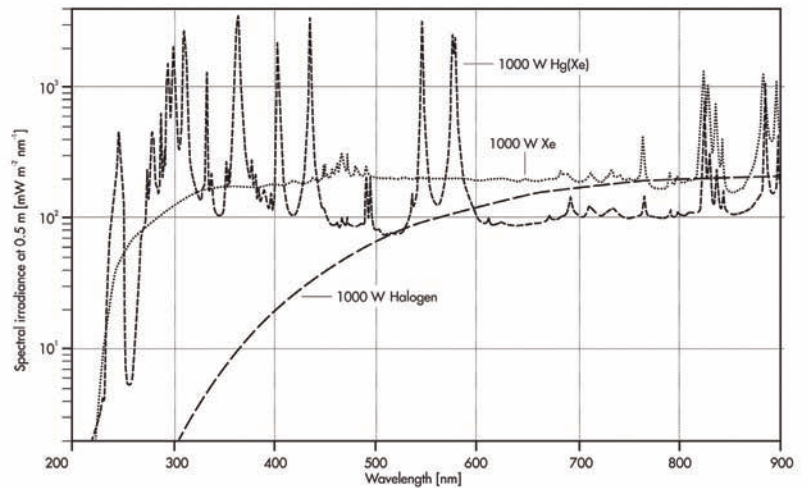
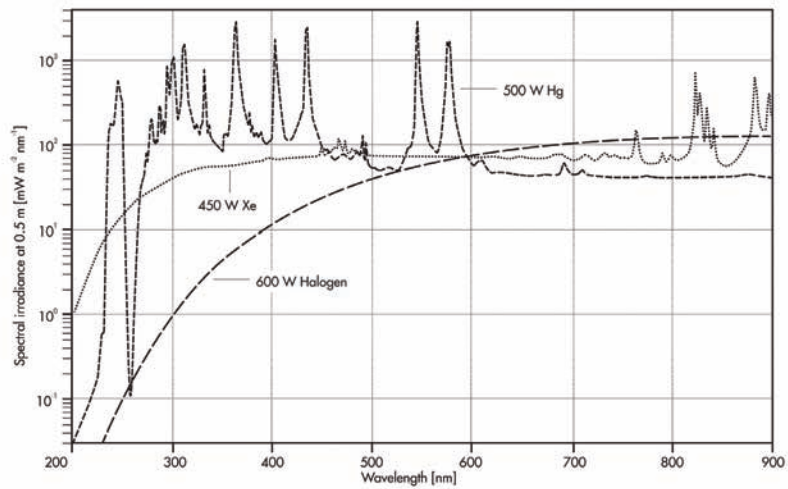
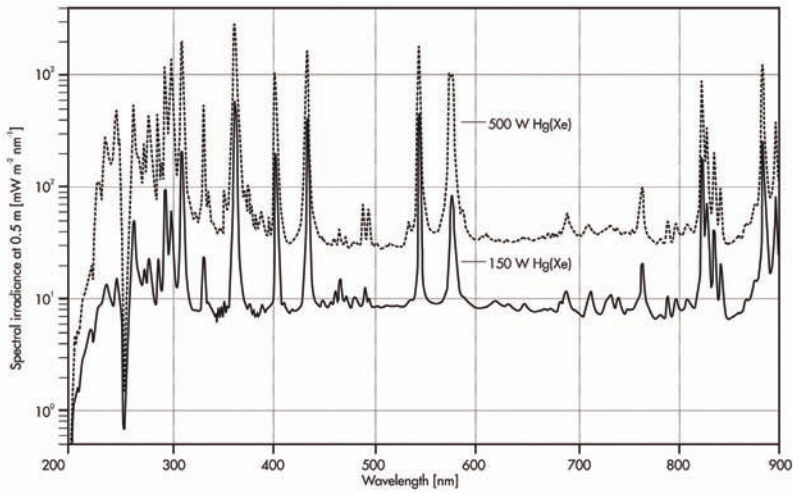
Power Supplies and Interfaces	
	Part Number
Power supply for halogen lamps up to 600 - 1000 W	AC-LSN610
Interface for halogen lamps	AC-LSE620



GRAPHS

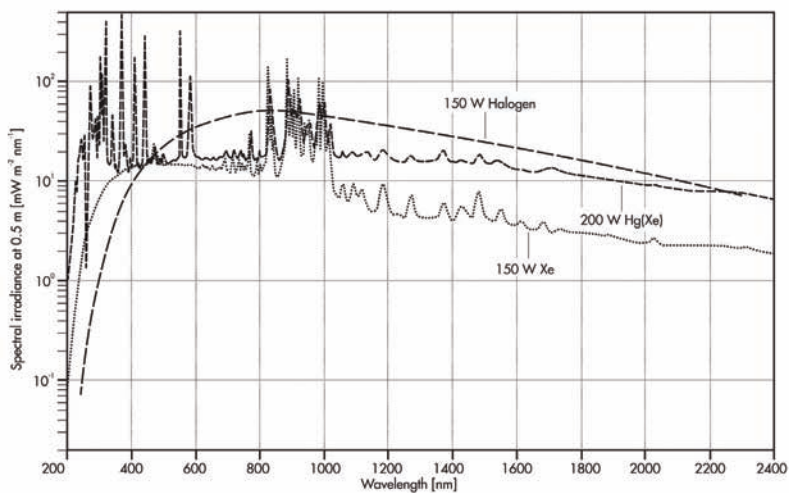
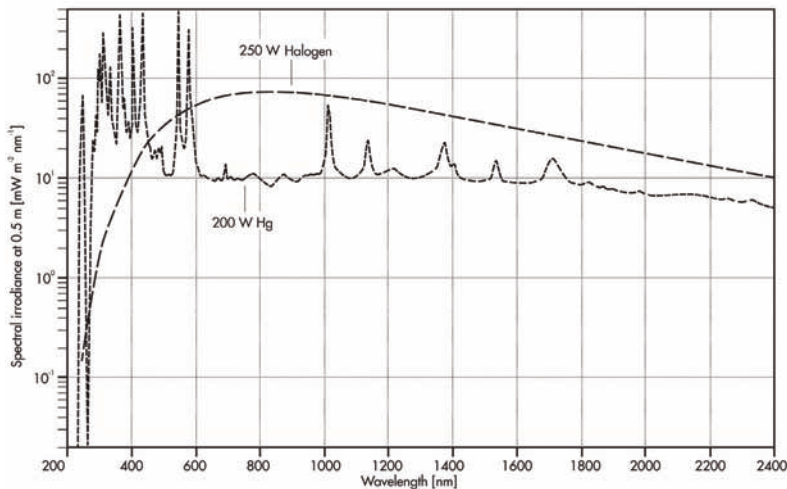
Examples of Lamp Spectra and Irradiance





GRAPHS

Examples of Lamp Spectra and Irradiance



Please Note:

The data in these graphs should only be used to compare one type of lamp versus another. Due to variations from lamp manufacturers as well as differences in optical systems, the values shown should be considered an approximation.



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