



FIBER OPTIC ILLUMINATORS



Sölarc® Arc lamps bring bright, white light into tight spaces. Our light engines and modules enable applications to deliver up to five times the brightness of halogen—with a whiter color temperature. Sölarc® technology is ideally suited for medical applications, as well as those found in more rugged, industrial environments.

USHIO offers a complete line of fiber optic illuminators and illuminator components. Included in this brochure are product images, a comparison graph and performance specifications.

The Sölarc® line offers wattages ranging from 24W to 60W, with corresponding outputs from 200 to 1200 lumens. Products LB24 (24W) and LB50IND (50W) are designed for industrial use. All Sölarc® products use Sölarc® light sources.

Offering the flexibility of battery or AC power, Sölarc® lamps have significantly longer lives than their halogen counterparts, and can be integrated into small, lightweight, yet durable products. Finally, the cost of use is noticeably less than with other illumination systems, further adding to customer satisfaction—and your profitability.

LIGHT BOXES

USHIO's Fiber Optic Illuminators exhibit superior performance, lamp life and, most importantly, the end user's cost of ownership. If the cost of light is one of the primary factors motivating key purchase decisions, then look no further than USHIO. Below is our comprehensive OEM product line of fiber optic illuminators for either medical or industrial applications. See the Performance Specification table on page 2.

LIGHT MODULES AND LIGHT ENGINES

USHIO makes available a variety of Sölarc® Light Engines and Modules that are designed to allow easy and reliable integration into your system. They provide the proper lamp environment, optical characteristics and a variety of flexible mechanical configurations. See the Performance Specification table on page 2.

LB24 (24W)



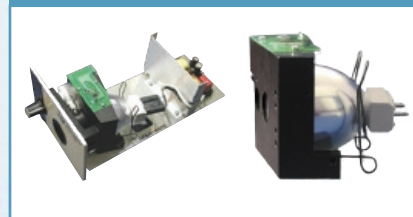
LB50IND (50W)



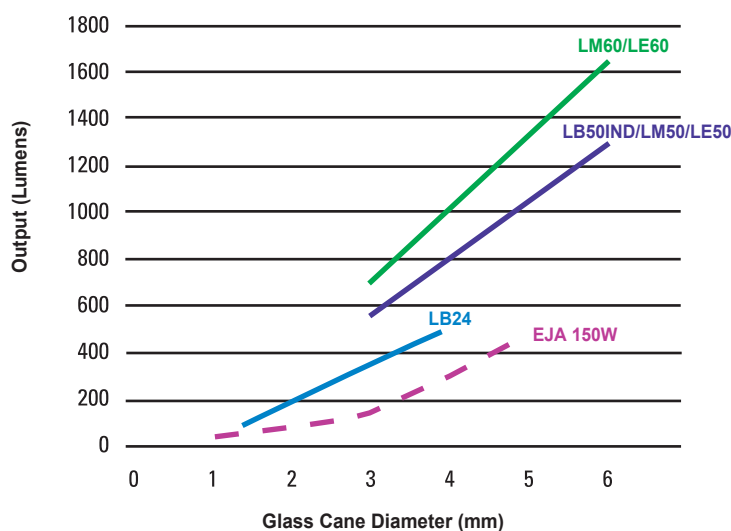
LE24 & LM24



LE50 & LM50



Performance Comparisons—Lumen Output vs. Diameter



Performance Specifications

Product	Dimension w x h x l (mm)	Weight	Lamp Power	Lumens	Color	Source	Source NA	Fiber Adapter	Intended Use	Optimal Fiber Size	Median Lamp Life
Sōlarc® Line											
LB24	81 x 64 x 114	0.8 kg	24W	590 ¹	90+CRI @ 5,500K	Sōlarc®	0.67	ACMI 12.5 mm	Industrial	2 mm–4 mm	750 hrs ²
LB50IND LE50 LM50	93 x 230 x 230 86 x 64 x 208 66 x 82 x 73	2.4 kg 0.6 kg 0.4 kg	50W	800 ¹	80+CRI @ 7,200K	Sōlarc®	0.69	ACMI Wolf Storz Olympus Pentax Machida	Industrial	3 mm–6 mm	3,500 hrs ³
LE60 LM60	86 x 64 x 208 66 x 82 x 73	0.6 kg 0.4 kg	60W	1000 ¹	80+CRI @ 6,500K	Sōlarc®	0.69	ACMI Wolf Storz Olympus Pentax Machida	Medical	3 mm–6 mm	800 hrs ⁴

1. 4 mm glass rod
2. Duty cycle: 3.5 hrs on / .5 hr off
3. Duty cycle: 11 hrs on / 1 hr off
4. Duty cycle: 2 hrs on / 1 hr off



LB24 SERIES INDUSTRIAL FIBER-OPTIC ILLUMINATOR

High-Intensity Arc Lamp Technology

USHIO's Sölarc® Fiber-Optic Illuminators use patented Sölarc® lamp technology. Sölarc® Illuminators combine the efficiencies of high-pressure metal halide arc lamps, precision miniature lamp construction and precise optical alignment to deliver unequaled fiber illumination performance and value.

Brilliant White Light

Unlike halogen-based light sources, Sölarc® Illuminators deliver intense, brilliant white light, typically with a color temperature greater than 5,000K — comparable to true daylight.

Long Life and Cost Effective

Sölarc® lamp technology is at the heart of the illuminator, requiring only 24 watts of energy and typically lasting about 500 hours (median life). Comparable halogen-based illuminators require 150 watts of power and may have average rated lifetimes between 40-50 hours. Sölarc® lamps consume considerably less energy and last nearly 10-12 times longer, assuring lower cost of ownership.

Superior Fiber-Optic Coupling

Available with an ACMI and optional industry-standard optical couplers, precisely aligned, highly efficient Sölarc® lamps provide superior light coupling into small and miniature fiber bundles. This allows the lamps to deliver significantly more light at a fraction of the size and wattage when compared to halogen alternatives.

Flexible Design

The LB24 series is available with a variety of fiberoptic couplers. The available power supply is rated for operation on voltages between 100 VAC and 240 VAC and frequencies from 50 Hz to 60 Hz.

Enhanced Features

- Internal Thermal Cutout
- Double Insulated
- Low Electrical Noise
- Cooler Operation
- Positive-Lock ACMI Fiber Adapter
- Full-Off Light Attenuation
- Medical-Grade UV/IR Filter Included
- Threaded Input Port—Allows for Custom Adapters
- Improved Lamp Retention System

Conforms to Industrial Standards

The LB24 series meets the standards identified in the accompanying specifications. Sölarc® Illuminators are the solution for applications that require intense, white illumination, such as lighting for borescopes, fiberscopes, UV/NDT inspection, fluorescence or microscopes.

Styles Available



LB24-NO
No Adapter
Allows fiber adapter
design flexibility

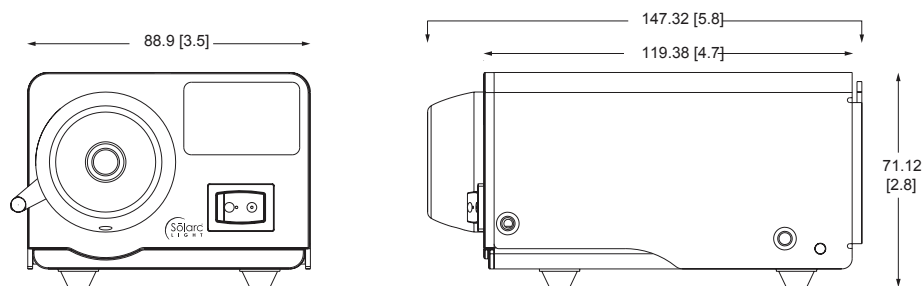
LB24-N4
ACMI Adapter



LB24 Specifications

Illumination System Lamp Light Output Color Temperature Lamp Life (Median) Integral Iris	Sölarc® Lamp Technology 590 Lumens (4 mm [0.16"] glass rod) 5,000K 500 Hrs 0%–100% attenuation				
Physical Dimensions Weight	147.3 mm [5.8"] length x 88.9 mm [3.5"] weight x 71.1 [2.8"] height 1.0 kg (2.2 lbs)—includes power supply 0.5 kg (1.2 lbs)—device only				
Electrical Power Supply Input Voltage Input Current Output Device Only Input Voltage Connector Type	100 to 240 VAC, 50-60 Hz 1 A @ 100 VAC 12 VDC, 3.4 A 12 VDC 2.1 mm [0.08"] x 5.5 mm [0.22"] Center Positive Jack (ref. Switchcraft 722A)				
Environmental Temperature Humidity	10°C (50°F) to 30°C (86°F) 15% to 95% RH noncondensing				
Approvals	EN/IEC 61010-1 CAN/CSA C22.2 No. 61010-1 CONFORMS TO: UL STD 61010-1				
Ordering Information Part Number LB24-N4 LB24-NO LBM-PS-00 LBM-PS-01 LB-CLP AL-1824 704904 704905 704906 50160 50159	<table border="1"> <thead> <tr> <th data-bbox="532 1108 922 1157">Description</th> <th data-bbox="922 1108 1458 1157">Available Power Supplies</th> </tr> </thead> <tbody> <tr> <td data-bbox="532 1157 922 1488"> Illuminator/ACMI Adapter Illuminator/No Adapter Power Supply—North American Power Supply—International Cigarette Lighter Power Plug Replacement Sölarc® Lamp AC Power Supply Cord—Europe AC Power Supply Cord—Australia AC Power Supply Cord—UK Olympus Adapter (screw-on) Storz Adapter (screw-on) </td> <td data-bbox="922 1157 1458 1488"> <div data-bbox="950 1171 1177 1333"> </div> <div data-bbox="1177 1186 1458 1270"> LBM-PS-00 included with LB24MS00-004-00. North American-Style Plug </div> <div data-bbox="950 1354 1177 1470"> </div> <div data-bbox="1177 1354 1458 1470"> LBM-PS-01 included with LB24MS00-004-01. IEC Adapter to allow a variety of cords (sold separately) </div> </td> </tr> </tbody> </table>	Description	Available Power Supplies	Illuminator/ACMI Adapter Illuminator/No Adapter Power Supply—North American Power Supply—International Cigarette Lighter Power Plug Replacement Sölarc® Lamp AC Power Supply Cord—Europe AC Power Supply Cord—Australia AC Power Supply Cord—UK Olympus Adapter (screw-on) Storz Adapter (screw-on)	<div data-bbox="950 1171 1177 1333"> </div> <div data-bbox="1177 1186 1458 1270"> LBM-PS-00 included with LB24MS00-004-00. North American-Style Plug </div> <div data-bbox="950 1354 1177 1470"> </div> <div data-bbox="1177 1354 1458 1470"> LBM-PS-01 included with LB24MS00-004-01. IEC Adapter to allow a variety of cords (sold separately) </div>
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LB24 (All measurements in mm [inches].)



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LB24M SERIES MEDICAL FIBER-OPTIC ILLUMINATOR

High-Intensity Arc Lamp Technology

USHIO's Sölarc® Fiber-Optic Illuminators use patented Sölarc® lamp technology. Sölarc® Illuminators combine the efficiencies of high-pressure metal halide arc lamps, precision miniature lamp construction and precise optical alignment to deliver unequaled fiber illumination performance and value.

Brilliant White Light

Unlike halogen-based light sources, Sölarc® Illuminators deliver intense, brilliant white light, typically with a color temperature greater than 5,000K—comparable to true daylight.

Long Life and Cost Effective

Sölarc® lamp technology is at the heart of the illuminator, requiring only 24 watts of energy and typically lasting about 500 hours (median life). Comparable halogen based illuminators require 150 watts of power and may have average rated lifetimes between 40-50 hours. Sölarc® lamps consume considerably less energy and last nearly 10-12 times longer than standard halogen lamps, assuring lower cost of ownership.

Superior Fiber-Optic Coupling

Available with an ACMI and optional industry-standard optical couplers, precisely aligned, highly efficient Sölarc® lamps provide superior light coupling into small and miniature fiber bundles. This allows the lamps to deliver significantly more light at a fraction of the size and wattage when compared to halogen alternatives.

Flexible Design

The LB24M series is available with a variety of fiber-optic couplers. It is rated for operation on voltages between 100 VAC and 240 VAC and frequencies from 50 Hz to 60 Hz.

Enhanced Features

- Internal Thermal Cutout
- Double Insulated
- Low Electrical Noise
- Cooler Operation
- Positive-Lock ACMI Fiber Adapter
- Full-Off Light Attenuation
- Medical-Grade UV/IR Filter Included
- Threaded Input Port—Allows for Custom Adapters
- Improved Lamp Retention System

Conforms to Medical Standards

The LB24M series meets the standards identified in the accompanying specifications. Sölarc® Illuminators are the solution for applications that require intense, white illumination, such as lighting for medical and dental procedures.

Power Supply Included with Each Illuminator



LBM-PS-00 included with LB24MS00-004-00. North American-Style Plug

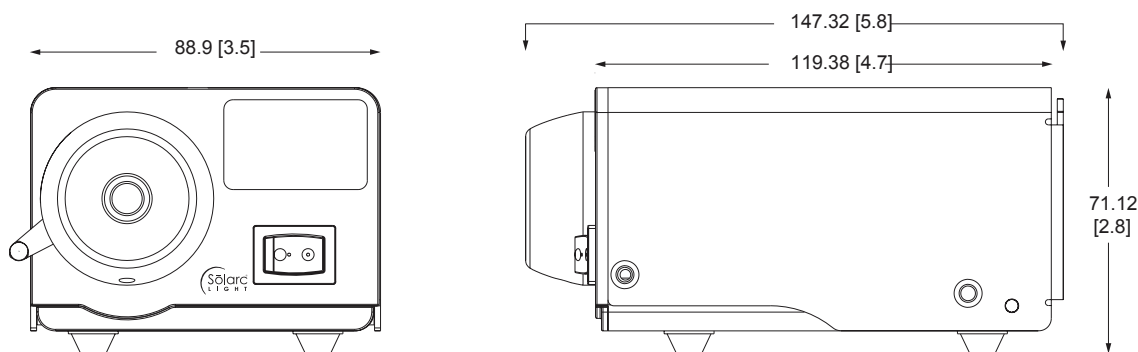


LBM-PS-01 included with LB24MS00-004-01. IEC Adapter to allow a variety of cords (sold separately)

LB24M Specifications

Illumination System Lamp Light Output Color Temperature Lamp Life (Median) Integral Iris	AL-0950 Sölarc® Lamp Technology 590 Lumens (4 mm [0.16"] glass rod) 5,000K 500 Hrs 0%–100% attenuation
Physical Dimensions Weight	147.3 mm [5.8"] length x 88.9 mm [3.5"] weight x 71.1 mm [2.8"] height 1.0 kg [2.2 lbs]—includes power supply
Electrical Input Voltage Input Current Leakage Current	100 to 240 VAC, 50-60 Hz 1 A @ 100 VAC <100 µA
Environmental Temperature Humidity	10°C (50°F) to 30°C (86°F) 15% to 95% RH noncondensing
Approvals	<div> EN/IEC 60601-1 CAN/CSA C22.2 No. 601-1, 1-M90 JIS T0601/J1000 IEC60601-1-2 </div> <div> UL60601-1 AS3200.1 EN55011 </div>
Ordering Information Part Number LB24MS00-004-00 LB24MS00-004-01 LBM-PS-00 LBM-PS-01 704904 704905 704906 50160 50159	Description Illuminator/ACMI Adapter—North America Power Supply Illuminator/ACMI Adapter—International Power Supply (requires power cord—sold separately) Replacement Power Supply—North America Replacement Power Supply—International (requires cord—sold separately) AC Power Supply Cord—Europe AC Power Supply Cord—Australia AC Power Supply Cord—UK Olympus Adapter (screw-on) Storz Adapter (screw-on)

LB24M (All measurements in mm [inches].)





LB50 SERIES

Arc Lamp-Based Light Source

USHIO's Sölarc® Fiber-Optic Illuminators are based upon the use of low-wattage metal halide arc lamps. Sölarc® Fiber-Optic Illuminators offer up to five times the light output per watt when compared to halogen light sources and even outperform some xenon-based sources.¹

Brilliant White Light

Unlike many halogen-based light sources, Sölarc® Illuminators deliver an intense amount of white light with a correlated color temperature (CCT) over 6,500K, providing true daylight illumination for improved color rendering and color balance.

Long Life/Cost Effective

The arc lamp used in Sölarc® Illuminators has a significantly longer life than comparable halogen lamps. Depending on power-up/power-down cycles, the Sölarc® lamp will last up to 10 times longer than many halogen lamps and up to five times longer than comparable xenon lamps.

Effective Light Coupling Into Fiber Bundles

The 1.2 mm short arc gap of USHIO's Sölarc® lamps efficiently launches light into small-diameter fiber bundles. This is in contrast to a halogen light source, which may waste a great deal of available light when coupling to fiber-optic cables.

Compact Enclosure

The Sölarc® Illuminator is housed in a compact metal chassis—so small, it may be mounted in or on test or inspection equipment.

Choice of Fiber Bundle Receptacles

The Sölarc® Illuminator is available with a choice of industry-standard fiber connectors.

Universal Power Supply

The product is provided with an internal switching power supply capable of operation with voltages between 90 and 240 VAC, at 50 to 60 Hz. The AC input cord is detachable so that international cord sets may be used.

Cool and Quiet

The LB50 runs so quietly you will hardly notice that it is running. The low-wattage lamp ensures cool operation without compromising brightness.

¹ Internal laboratory measurements of multiple sources using glass canes, 2001.

LB50 Specifications	
Physical Dimensions Weight	230 mm [9.05"] wide x 93 mm [3.66"] high x 230 mm [9.05"] length Light Box: 2.42 kg [5.34 lbs]
Environmental Temperature—Operating Temperature—Storage Humidity—Operating	0°C (32°F) to 40°C (104°F) -21°C (-5.8°F) to 54°C (129.2°F) 0% to 95% Relative Humidity, noncondensing
Electrical Power Supply Input Voltage Power cords available: Domestic, Japan, Europe, UK, Australia	90 to 240 VAC, 50/60 Hz
Optical Interfaces Fiber Bundle Adapters Intensity Control	LB50IND-001—Industrial Light Box, 50 W Pentax LB50IND-002—Industrial Light Box, 50 W Machida LB50IND-003—Industrial Light Box, 50 W Storz LB50IND-004—Industrial Light Box, 50 W ACMI LB50IND-005—Industrial Light Box, 50 W Wolf LB50IND-006—Industrial Light Box, 50 W Olympus (Custom on request) Provides 0% to 100% attenuation of output light using mechanical light vane
Reflector Specifications	Type: Elliptical MR-16 Numerical Aperture: 0.69 Spot Size @ Focal Plane: 6 mm [0.24"] @ 50% Intensity
Light Output—LB50IND Correlated Color Temperature	White Light 7,200K (nominal)
Light Delivery Into Fiber Bundle—LB50IND Measured through 4 mm cladded glass rod (Numerical Aperture: 0.64)	800 Lumens (average)
Lamp Life—LB50IND Typical Laboratory Tested	3,500 hours (median) at 11 hours on, 30 minutes off duty cycle
Agency Certificates—LB50IND	Industrial Version (Optional) ETL Listed UL 61010-1 CAN/CSA – C22.2 No. 61010-1 (Spaced Intentionally) EN 61010-1 IEC 61010-1 (or IEC/EN 61010-1 in place of listing it separately) (Spaced Intentionally) FCC Part 15 Class A, EN55011, IEC/CISPR 11, EN/IEC 61000-6-2
Warranty	One Year, excluding Lamp
Mounting	Desktop Mounting on Rubber Feet
Replacement Bulb	Sölarc® Metal Halide Arc Lamp, P/N AL-5060



LM24 SERIES

Sölarc® 24W Light Module

Designed specifically for applications that require bright, white light in confined spaces. The LM24, with the compact yet powerful Sölarc® lamp, delivers superior lumens/watt illumination: three times brighter than halogen equivalents. Three separate components make up the module—the lamp with an integrated cooling mounting block, ballast and connector that are sold separately. Fiber optic adapters are easily attached by the two front threaded mounting holes, preserving the lamp's focal point. The Sölarc® Light Module system dramatically reduces time to market by allowing you to quickly integrate Sölarc® technology into your equipment. The LM24 significantly improves maintenance; lamp replacement cycles and provides cool, quiet operation.

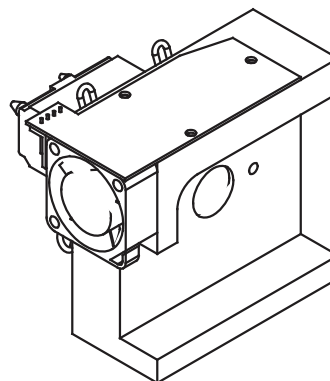
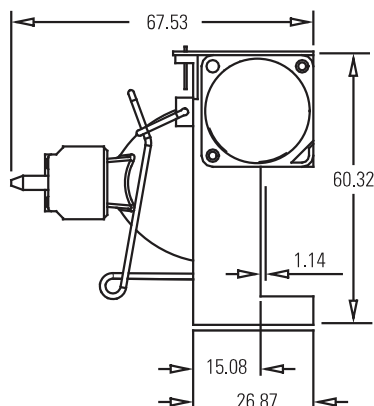
Lamp Replacement

The LM24 Sölarc® lamp has been laboratory tested to 1,000 hours median life at 3-1/2 hours on, 15 minutes off duty cycle, delivering a true economic advantage over the life of your product. The integrated lamp mounting block ensures the optimal thermal environment without excessive power requirements or noise.

Ballast / Power Supply

The LM24 ballast has been designed to meet demanding requirements for small size, high efficiency, and consistent performance. A self-contained system that combines starting, regulating and safety features, the B25R001 ballast is ready to support any Sölarc® application: commercial, industrial or medical.

B25R001 Ballast (All measurements are in mm.)



Note: This ballast must be connected to DC power; it cannot be plugged into a wall socket AC line.
A separate connector cable assembly, C18A003, is required to connect the LM24 and B25R001.



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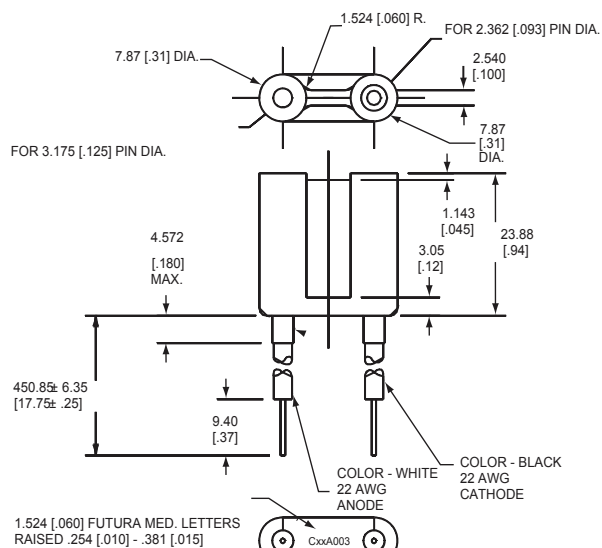
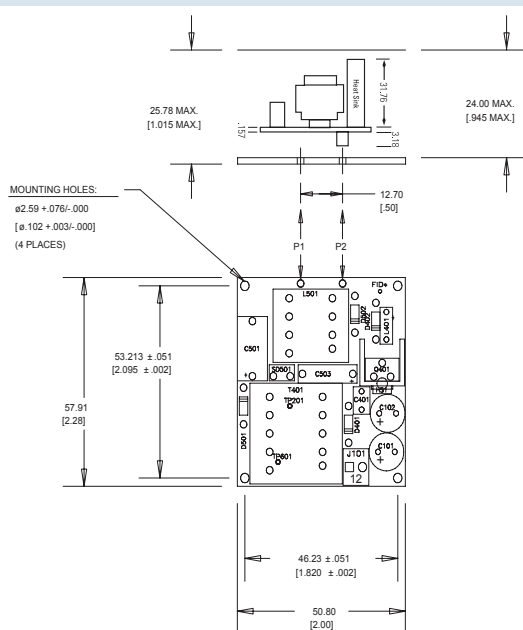


Specifications	
Physical Dimensions Weight	69 mm (2.72 in) wide x 60 mm (2.36 in) high x 68 mm (2.68 in) length 198 gms (0.44 lbs)
Environmental Temperature—Operating Temperature—Storage Humidity—Operating	0°C to 40°C -21°C to 54°C 0% to 95% Relative Humidity, noncondensing
Electrical/Ballast B25R001 Input Voltage Input Current, Steady State (SS) Inrush Current Lamp Strike Voltage Efficiency	+11 to +16.0 VDC Sölarc® LM24—2.6 A average @12 VDC 50 A < 100 µsec peak, 15 A < 1 msec average ~9 kV peak ~78% at 15 VDC & 25°C
Light Output Correlated Color Temperature	White Light 5,460K (nominal)
Light Delivery Into Fiber Bundle	500 lumens (avg) through 4 mm cladded glass rod (Numerical Aperture: 0.64)
Reflector Specifications	Type: Elliptical MR-11 Numerical Aperture: 0.67 Spot Size @ focal plane: 2 mm @ 50% intensity
Lamp Life Typical Laboratory Tested	500 hours (median) @ 1 hour on / 15 minutes off duty cycle 1,000 hours (median) @ 3.5 hours on / 15 minutes off duty cycle
Warranty	One year, excluding lamp
Replacement Bulb	Sölarc® metal halide arc lamp, P/N AL-1824

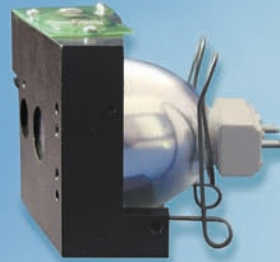
B25R001 Ballast

C18A003 Connector Assembly

All measurements are in mm [inches]



Note: This ballast must be connected to DC power; it cannot be plugged into a wall socket AC line.
A separate connector cable assembly, C18A003, is required to connect the LM24 and B25R001.



LM50 SERIES

Sölarc® 50W Light Module

Designed specifically for industrial applications that require bright, white light in confined spaces. The LM50 lamp delivers the industry's best lumens/watt illumination: more than three times brighter than halogen equivalents. Three separate components make up the module—the lamp with an integrated cooling mounting block, the ballast and connector cable assembly that are sold separately. Fiber-optic connections are easily attached by the two front-thread mounting holes, preserving the lamp's focal point. The Sölarc® system dramatically reduces time to market, significantly improves maintenance and replacement cycles, and provides cool, quiet operation.

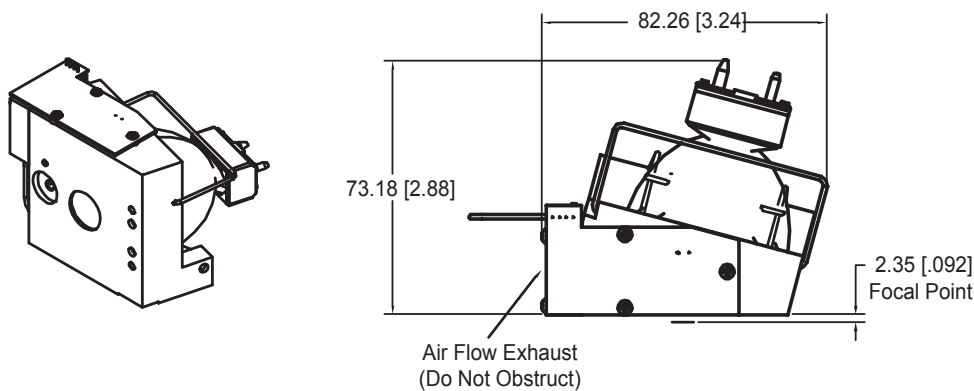
Lamp Replacement

The LM50 Sölarc® lamp has been laboratory tested to 3,500 hours median life at 11 hours on/30 minutes off duty cycle, delivering a true economic advantage over the life of your product. The integrated fan—which adjusts its operation to match local temperature—ensures an optimal thermal environment without excessive power requirements or noise.

Ballast/Power Supply

The LM50 ballast has been designed to meet demanding requirements for small size, high efficiency and consistent performance. It provides selectable wattage settings, allowing roughly 20% variation in light output. A self-contained system that combines starting, regulating and safety features, the LM50's ballast is ready to support any Sölarc® application: commercial, industrial or medical.

LM50 Light Module (Measurements are in mm [inches].)



Note: This ballast must be connected to DC power; it cannot be plugged into a wall socket AC line. A separate connector cable assembly, C18A003, is required to connect the LM50 and B50R004R ballast.

LM50 Specifications

Physical Dimensions Weight	66 mm [0.24"] wide x 82 mm [3.23"] high x 73 mm [2.87"] length 369 gm
Environmental Temperature–Operating Temperature–Storage Humidity–Operating	0°C (32°F) to 40°C (104°F) -21°C (-6°F) to 54°C (129°F) 0% to 95% Relative Humidity, noncondensing
Electrical/Ballast (B50R004R Ballast) Input Voltage Input Current, Steady State (SS) Inrush Current Lamp Strike Voltage Output Wattage (switchable) Efficiency	+11 to +16.0 VDC Sölarco® LM50 - 4.8 A average @ 12.0 VDC ~15 A < 100 µsec ~9 kV peak 50, 55, 60W Nominal performance specifications of the LM50 are significantly altered when operating at wattages other than 50W. ~78% @ 15 VDC and 25°C (77°F)
Light Output Correlated Color Temperature	White Light 6,500K (nominal)
Light Delivery Into Fiber Bundle	800 Lumens (avg) through 4 mm [0.16"] clad glass rod (Numerical Aperture: 0.64)
Reflector Specifications	Type: Elliptical MR-16 Numerical Aperture: 0.69 Spot Size @ focal plane: 6 mm [0.24"] @ 50% intensity
Lamp Life Typical Laboratory Tested	3,500 Hours (median at 11-hours on/30-minutes off duty cycle)
Warranty	One year, excluding lamp
Replacement Bulb	Sölarco® metal halide arc lamp, P/N AL-5060

B50R004R Ballast (All measurements are in mm [inches].)

Power Settings

Bottom Side

Top Side

Mounting Holes
2.59 + .076/-00
4Plcs [2.28 + .003/-0.000]

Power Setting Shown As 50W

Heat Sink

User Selectable

Note: This ballast must be connected to DC power; it cannot be plugged into a wall socket AC line.
A separate connector cable assembly, C18A003, is required to connect the LM50 and B50R004R ballast.

Factory preset at 50W operation.
Set switch for discrete wattage settings (50, 55, 60W) as shown here.



B19R001, B22R001R, B25R001R BALLASTS

USHIO's ballasts are designed to operate with USHIO Sölarc® lamp products only. The ballast consists of an internal regulator that delivers constant power to the Sölarc® lamp. This design is ideally suited for both battery and AC power supply driven applications where both small size and high efficiency are needed.

USHIO's ballasts are self-contained systems with all the necessary starting, regulating and safety features to meet any needs from commercial to medical applications.

Performance Specifications			
Electrical	B19R001	B22R001R	B25R001R
Input Power	Specifications, unless otherwise indicated, are nominal at or near 25°C.		
Turn On Voltage ¹ (volts DC)	9.8		
Turn Off Voltage ¹ (volts DC)	9.2		
Maximum Voltage (volts DC)	16		
Steady State Current ² (DC @12V)	2.0A	2.3A	2.6A
Environment			
Operating Temperature (°C)	0 to 70 (forced convection cooling recommended)		
Storage Temperature (°C)	-40 to 105		
Pinouts	Connector		
Input Power (Molex 41761 series)	J101	Pin 1 = "+" input power Pin 2 = "-" input power	
Output Power	P1 P2	Anode, white wire on ballast connector Cathode, black wire on ballast connector	

¹ Turn on and turn off specifications are a function of input wiring resistance. The specifications shown are for the condition where the voltage at the pins of J101 are regulated using the remote sense leads of a power supply.

² Steady state current flow after lamp warm up.

Mechanical

Figure 1. Assembly dimensions and connector locations. Dimension units are mm (inches).

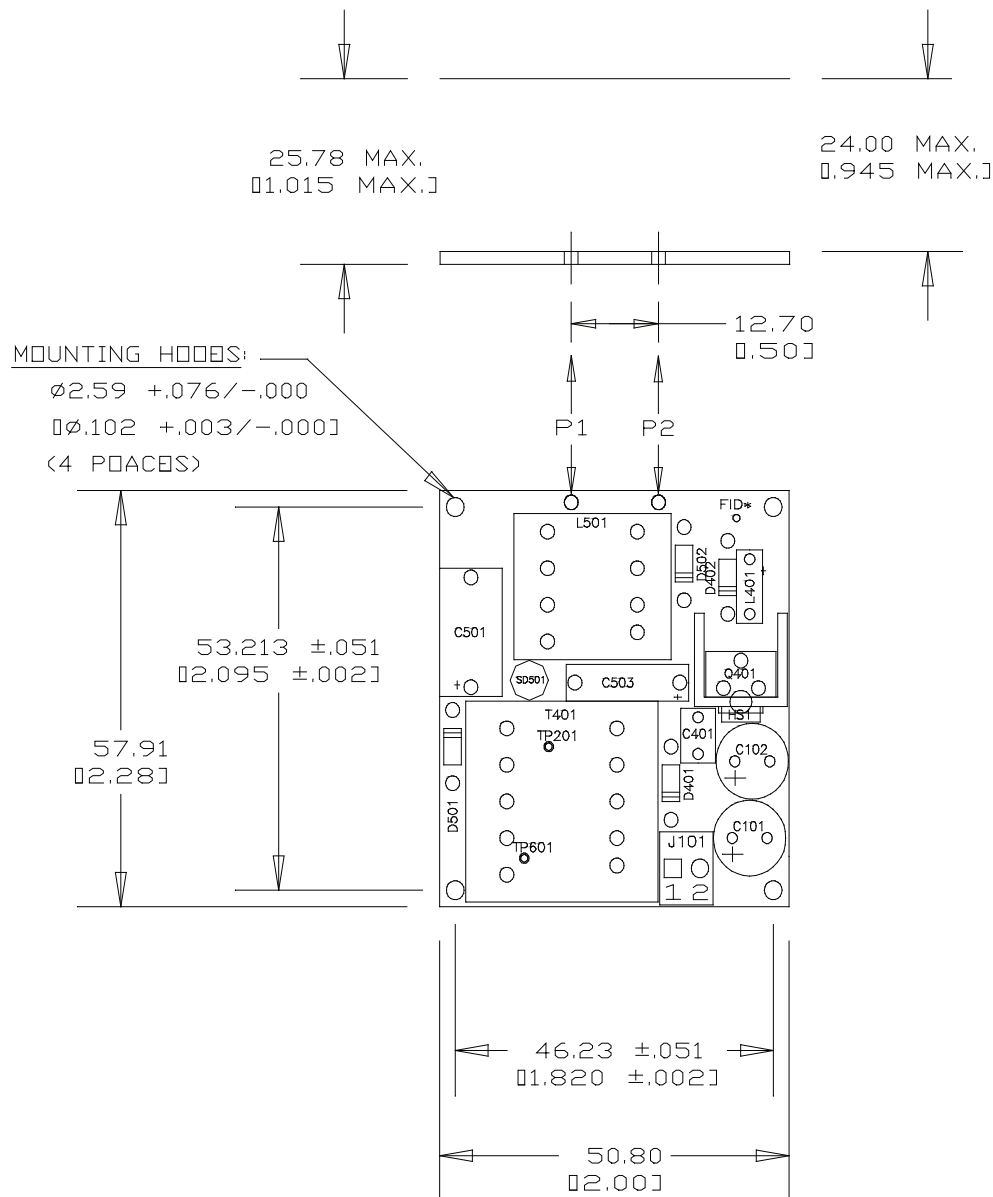
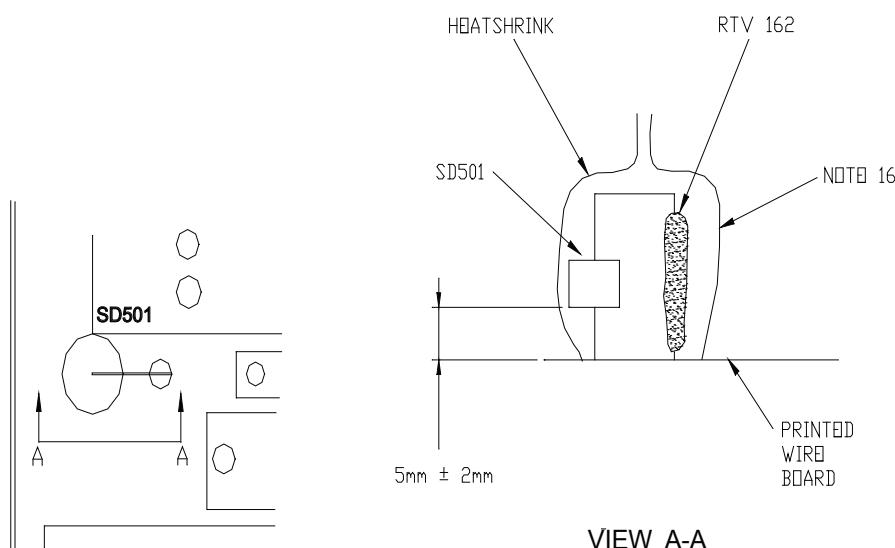


Figure 2



Don't allow the metal end of the can, bottom end, to make contact with the upper lead when it is formed and inserted into the PWB.

Don't allow the leads or the metal ends of the can to come into contact with any adjacent parts.

Wiring and Preparation Instructions

- 1) Mount the ballast as desired using the corner holes provided on the PWB or some other acceptable means.
- 2) Construct an input power connector assembly suitable to your application. Slide the connector housing portion of the assembly onto the J101 connector until the mating halves lock in place. Observe polarity in wiring as specified in the pinouts section in the performance specifications table. Locate J101 on the bottom edge of the assembly view in Figure 1.
- 3) Solder the Cathode lead (black wire) of the lamp connector assembly to P2. Solder the Anode lead (white wire) of the lamp connector assembly to P1. Locate P1 and P2 on the top edge of the assembly view in Figure 1. Failure to observe the lamp wiring polarity will degrade important performance features of the lamp.
 - Shortening the connector assembly leads is permissible.
 - Route the anode lead to minimize stray capacitance to it.
 - **High voltage pulses are present on P1 during ignition.**
 - **Using the provided lamp connector assures proper operation.**
- 4) Mount the lamp suitably for your evaluation purposes. Keep in mind that mounting techniques affect operating temperature and lamp performance. Lamp life is inversely proportional to operating temperature.
- 5) Connect the lamp and ballast using the appropriate connector assembly.
- 6) A small amount of air flow is recommended for cooling the ballast.

Safety

These Sōlarco® lamp ballasts have been designed to meet worldwide safety regulations when applied correctly. Since it is a secondary device, it is part of the end product's approval. It may also conform to any EMC directives when the ballast and the lamp are enclosed in a metal or metal-coated enclosure. Proper interlocking for lamp replacement is always highly recommended. There is a risk of electric shock when using the ballast without proper precautions.



B50R004R BALLAST

USHIO America's ballast products are designed to operate with USHIO America Sölarc® lamp products only. The ballast consists of an internal regulator that delivers constant power to the Sölarc lamp. This design is ideally suited for both battery and AC power supply-driven applications where both small size and high efficiency are needed. The new wattage setting feature allows you to select your lamp wattage within a 10W range to achieve a 20% light output difference. The ballast is a self-contained system with all the necessary starting, regulating and safety features to meet any application, from commercial to medical.

Performance Specifications

Electrical (all measurements are at 25°C)

Absolute Maximum Input Voltage	16.0 VDC
Minimum Safe Input Voltage Range	11.0 VDC
Operating Input Voltage Range	12.0 VDC to 15.0 VDC
Input Current Range	5.6 A @ 12.0 VDC, 4.4 A @ 15.0 VDC
Lamp Run-Up (Cold)	2.0 A/sec
Nominal Lamp Voltage	55V ± 6V
Inrush Current	~15 A < 100 µsec
Time to Shut Down	3.0 sec nominal
Ignition Voltage	~9 kV Peak
Output Wattage	Switchable in 3 increments: 50, 55, 60W*
Efficiency	~78% @ 15.0 VDC and 25°C

Environmental

Storage Temperature Range	-40°C to +105°C
Operating Temperature Range	0°C to +70°C
Air Flow Requirements	10 cfm @ 25°C ambient

*The B50R004R is factory preset at 50-watts operation. If other wattage settings are desired, refer to user-selectable "Power Setting" diagram on the back of this datasheet. Consult the factory for technical assistance per lamp and ballast. Cooling, lamp life and output performance will change depending on ballast wattage setting.

Application Notes

Increase airflow requirements by 1 cfm for every 2°C rise above 25°C. Do not allow the temperature of the MOSFET attached to the heat sink to rise above 90°C. Additional heat sinking is possible by screwing more thermally conducting material to the top of the heat sink. Use a #2 screw and thermal compound to ensure proper conduction.



Mounting

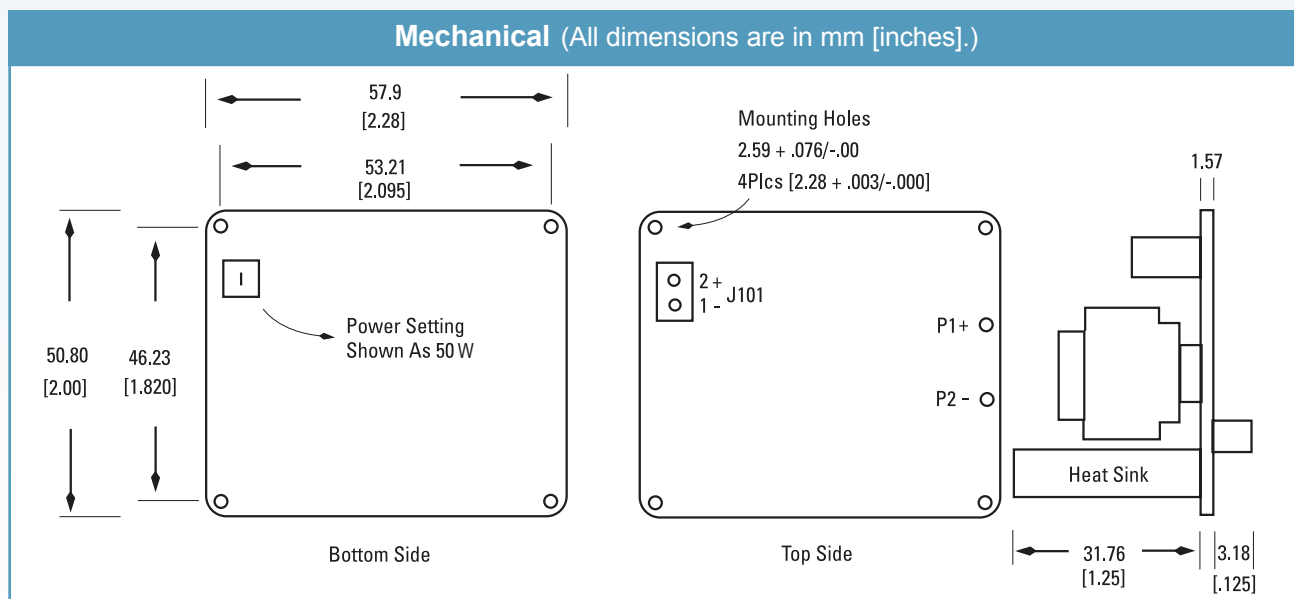
Mount the ballast using the four holes in the corners with a #2 screw. The heat sink should not be used for mounting because it is electrically floating. Since there is high voltage on the board, spacing of 6.35mm [0.25 inches] on all sides is required or appropriate insulating material must be used.

Safety

This ballast, as well as all others produced by USHIO America for the Sōlar arc lamp, has been designed to pass commercial and medical safety regulations world-wide when applied correctly. Since it is a secondary device, it is part of the end product's approval. It also may conform to any EMC directives when the ballast and the lamp are enclosed in a metal or metal-coated enclosure. Proper interlocking for lamp replacement is always recommended. There is a risk of electric shock when using the ballast without proper precautions.

Connections

Input Power Molex Part Number 09-05-1021 – J101 pin 2: +
J101 pin 1: –
Lamp Connection P1 + Soldered High-Voltage Wires
P2 – Soldered High-Voltage Wires



Power Settings—User Selectable



Factory preset at 50W operation.

Set switch for discrete wattage settings (50, 55, 60W) as shown here.