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INSTRUCTION MANUAL

LUME-X “DLP”

Xenon Lamphouse

Type 72-00095

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STRONG INTERNATIONAL

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PREFACE

THE STRONG LUME-X is a reflector type, direct current projection lamphouse using a xenon bulb as the light source. Only xenon bulbs designed for horizontal operation should be used in this lamphouse. The reflector is a metal, deep ellipse type with a dichroic coating to reduce infrared heat output. The reflector is designed to operate in a fixed position and has a working distance of 21 inches (53 cm).

THE ADJUSTMENT CONTROL to position the xenon bulb in relation to the reflector is located on the rear of the lamphouse behind the cover panel. This control mechanism permits horizontal and vertical movement, and focus control of the xenon bulb.

THE LAMPHOUSE is equipped with a DC ammeter to indicate the operating current of the lamp. A pushbutton switch below the meter alters the meter to indicate the DC voltage at the arc. This capability permits immediate calculation of the lamp power while the lamp is operating.

AN ELAPSED TIME METER registers the total number of hours the lamphouse has been in service, and provides a means of recording the number of hours each xenon bulb has been operating. A Xenon Bulb Record chart is provided on the inside back cover of this manual for maintaining an accurate log of bulb life. This information will be required in the event of a bulb warranty adjustment.

A 115 V.AC BLOWER is internally wired in the lamphouse, and is required to maintain the seals on the bulb at a safe operating temperature. This blower will operate continuously until the xenon power supply is de-energized. The blower motor is protected by a 1.5 ampere fuse.

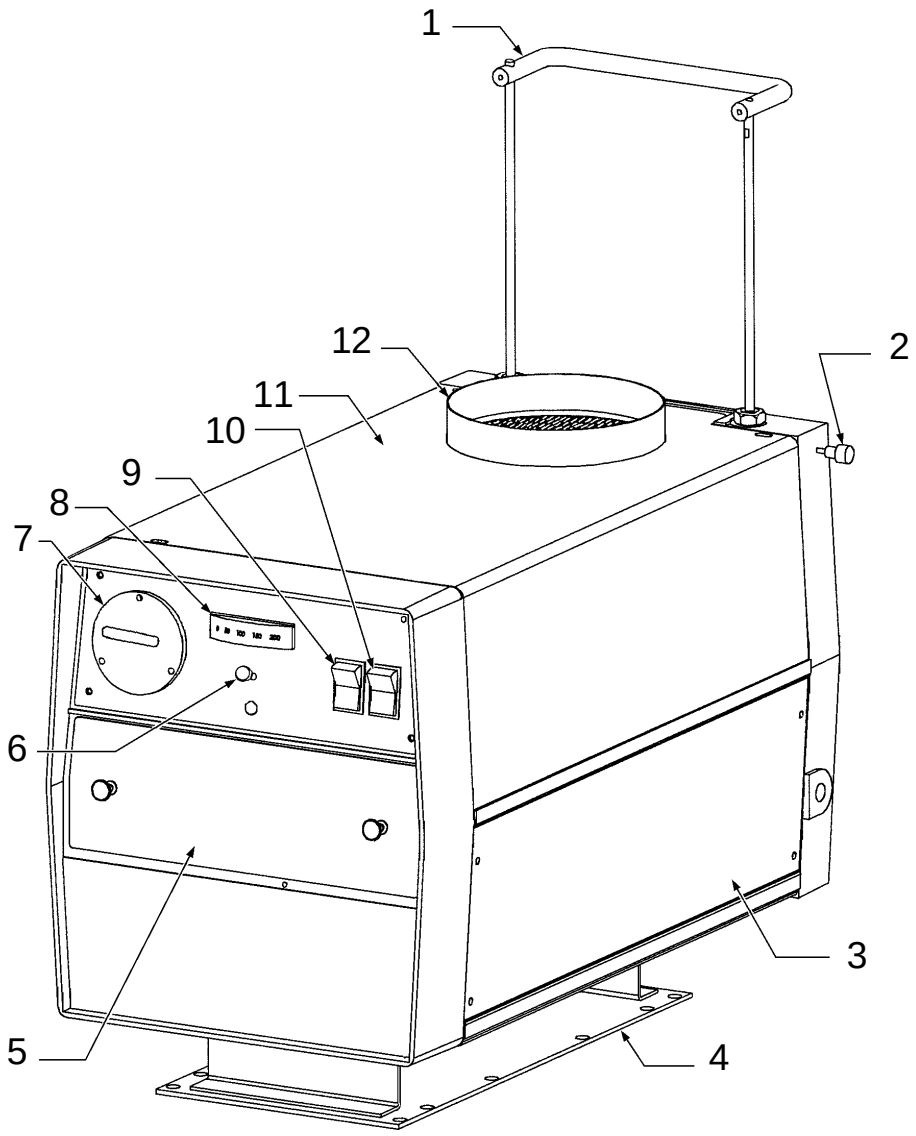
AN AIR FLOW SWITCH, attached to the blower, will prevent ignition of the lamp if the blower is not operating. It will also interrupt operation of the lamp if the blower fails to maintain an adequate air flow to keep the actuator vane of the switch closed. A top cover interlock switch will disable lamphouse operation when the top cover is removed for bulb installation or lamphouse service

THE “MODE” rocker type switch on the rear of the lamphouse provides the means of operating the equipment from a remote station or automation controller when in the “AUTO” position. The LAMP switch is used for bulb ignition when the MODE switch is in the “MAN.” (manual) position.

A DC PULSE IGNITER operates fom the DC open circuit voltage normally developed by the xenon power supply. Lamphouse control circuitry is thereby simplified since the igniter requires no AC circuit for operation.

THE LAMPHOUSE DOUSER is provided to permit cutting off the light to the projector. The lamp should not be operated for any extended period of time with the douser closed. The small intense spot of light on the douser plates may cause deterioration.

IF AT ANY TIME you have a suggestion, or desire aid in securing anticipated results, please feel free to write directly to STRONG INTERNATIONAL, 4350 McKinley Street, Omaha, Nebraska 68112.



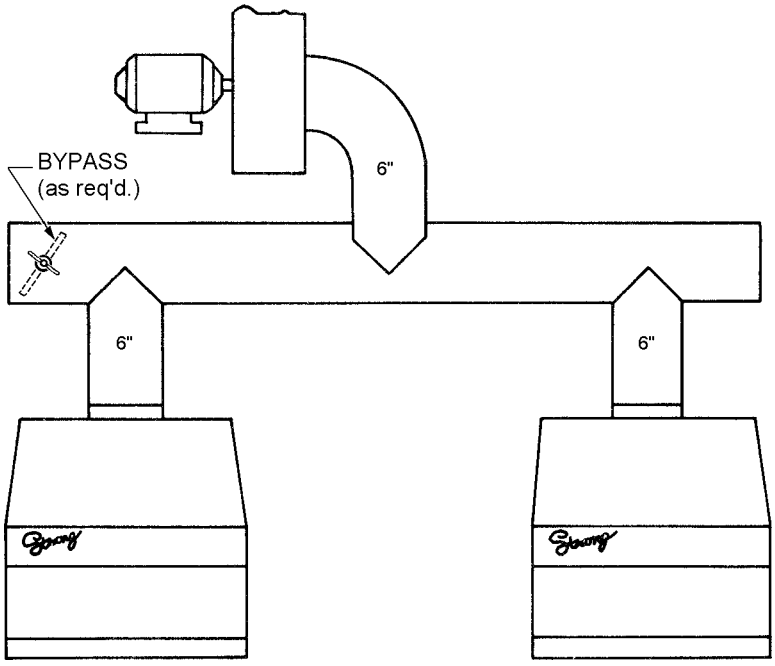
1. Douser Handle; Lift to Close
2. Douser Knob; Pull to Open
3. Lower Cover; Igniter Access Panel
4. Base Adapter Assembly
5. Bulb Adjust Cover Panel
6. “Press for Voltage” Switch
7. Elapsed Time Meter
8. Volt/Ammeter
9. MODE Switch (Auto/Manual)
10. LAMP Switch (On/Off)
11. Top Cover Assembly
12. Exhaust Stack, 6" (152mm) Diameter

EXHAUST SYSTEM INSTALLATION

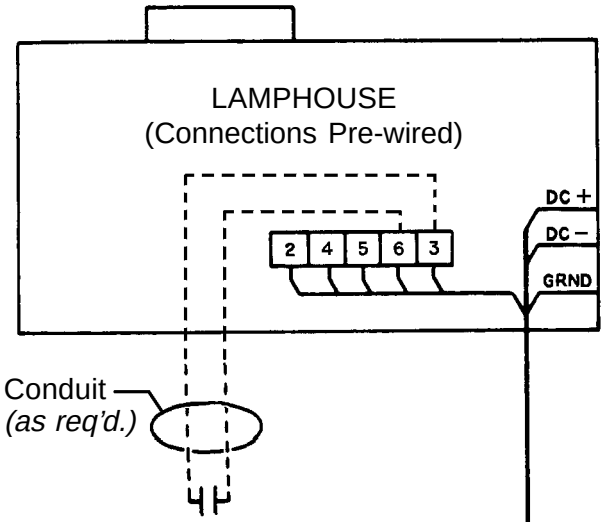
THE EXHAUST STACK of the Lume-X is designed to fit a six inch diameter duct. This size ducting, either rigid or heat-resistant flexible, must be used throughout the complete exhaust system. The exhaust system must be vented to outside air, and installed in such a manner as to eliminate any possibility of downdraft or rain dripping into the lamphouse.

THE EXHAUST SYSTEM must be capable of removing 300 cubic feet of air per minute (300 cfm) *measured at each lamphouse.* Insufficient exhaust draft can significantly reduce bulb life, and cause possible injury by overheating the lamphouse enclosure.

IF EXHAUST AIR FLOW must be restricted for any reason, it is recommended to install bypasses, rather than dampers, in the exhaust system.



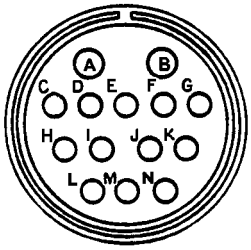
LAMPHOUSE-POWER SUPPLY INTERCONNECTION DIAGRAM



Conduit
(as req'd.)

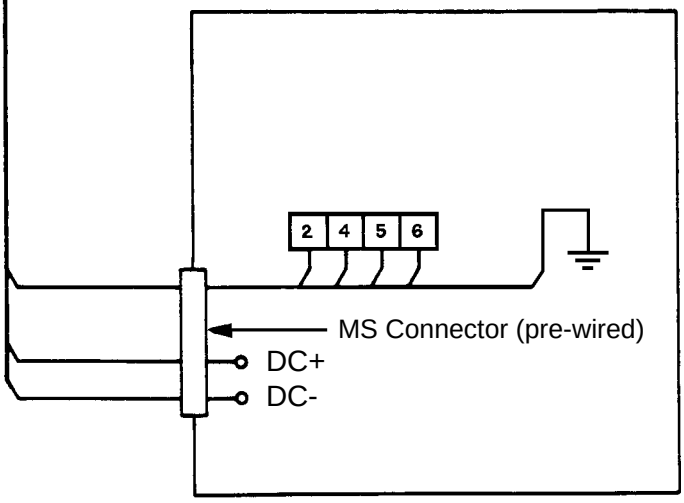
Remote - Auto Sustained 5 Amp. Dry Contact
(by Installer)

Lamphouse Color Code	
2	Brown
4	Orange
5	Blue
6	Yellow
3	Red
Ground	Green



MS CONNECTOR	
Pin	Wire No,
A	DC-
B	DC+
C	2
D	3
E	4
F	5
G	6
M	Grnd

Lamphouse Cable Assembly

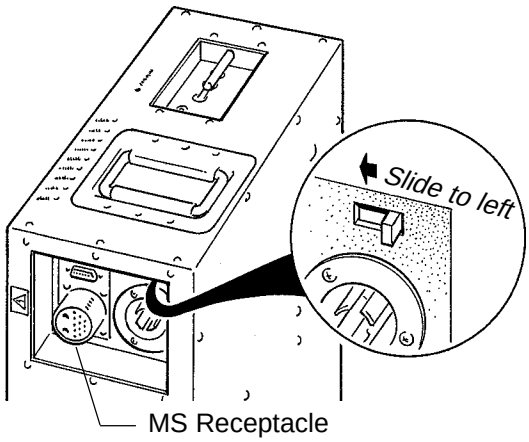


SYSTEM **MUST** BE GROUNDED
All wiring must conform to local codes; shield lamphouse cable in conduit if required.

WIRING INSTALLATION

THIS LAMPHOUSE is intended for operation in conjunction with the Compact model, switching-type xenon power supply designed for bulb wattages ranging from 700-2500 watts and supplied by Strong International. This model is available in domestic and international input voltages; check Equipment Data Plate, and refer to wiring instructions in the power supply manual, before connecting AC input.

THE LAMPHOUSE/POWER SUPPLY interconnection cable assembly includes a pre-wired multipin MS plug containing all power and lamp control connections. De-energize the power supply before connecting the plug. The plug is keyed to a mating receptacle on the power supply cabinet. Align the key to insure correct pin interconnection before tightening the locking ring. Check the slide switch on the power supply and slide it to the *left* (for "lamphouse" operation) as required. See the notice on the inside of the front cover of the Xenon Power Supply Instruction Manual.



IF EMPLOYING the "MAN. - AUTO" ignition feature in lamphouse operation, the required wiring is most easily connected at the lamphouse terminal board. See the Interconnection Diagram for 3 - 6 wiring; DO NOT apply voltage to these terminals.

ALL LEADS may be run in conduit or greenfield if desired or if required by local code. This may also be necessary as shielding to prevent electrical interference from feeding into the theatre sound system.

AUTOMATION SYSTEMS

TO INTERCONNECT the Lume-X to an automation system, two 16 gauge wires (not supplied by Strong) must be customer-installed as illustrated on the Interconnection Diagram. These wires must be shielded to prevent interference in the theatre sound system.

NOTE: Lamphouse ignition in "AUTO" mode is effected by a sustained dry contact closure across terminals 3 and 6. DO NOT apply voltage to these terminals. Refer to instructions furnished by the manufacturer of the automation controller.

TO OPERATE with an automation system, place the MODE switch in "AUTO," and the LAMP switch to "ON." When the xenon power supply is energized, the lamphouse blower will operate. The bulb will not ignite until the automation controller applies a dry contact closure between terminals 3 and 6. This closure must occur *after* the projector motor "start." Opening this contact will extinguish the bulb, but allow the blower to continue to operate.

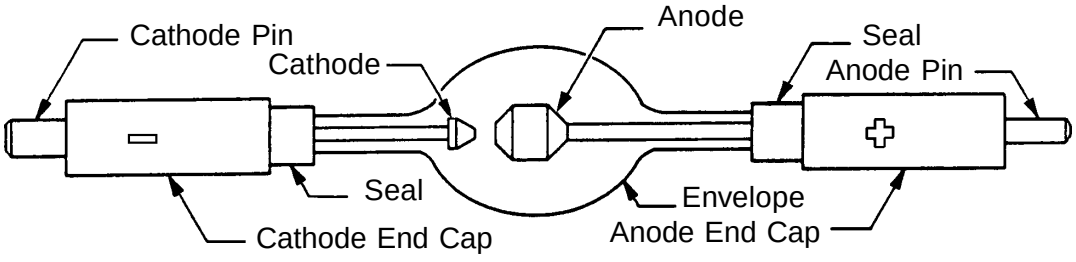
IN THE EVENT of an automation failure, manual control of the lamphouse can be restored by placing the MODE switch in "MAN." and switching "ON" and "OFF' using the LAMP switch.

SAFETY PROCEDURES

THE XENON BULB is highly pressurized. When ignited, the normal operating temperature of the bulb increases the pressure to a level at which the bulb may explode if not handled in strict accordance to the manufacturer's operating instructions. The bulb is stable at room temperature, but may still explode if dropped or otherwise mishandled.

REFER bulb replacement and service to QUALIFIED PERSONNEL with adequate protective clothing (face shield, clean cotton gloves, welder's jacket). For routine lamphouse service, observe the following rules:

1. Allow the bulb to cool to room temperature before opening the lamphouse. Put on protective clothing described above.
2. De-energize the xenon power supply at the AC source before opening the lamphouse compartment.
3. When possible, encase the bulb in its protective cover when cleaning or servicing the interior of the lamphouse. The bulb, when outside the lamphouse, must be encased in the cover.
4. Clean the bulb after it has cooled to room temperature. Do not touch the quartz envelope of the bulb; fingerprints will burn in and create hot spots which may shorten bulb life. If fingermarks are made, they should be carefully removed with methyl alcohol and cotton prior to bulb operation.
5. Never view an ignited bulb directly. BLINDNESS OR PERMANENT EYE DAMAGE MAY BE INCURRED.
6. Use only xenon bulbs designated as OZONE FREE. When possible, vent the lamphouse exhaust to outside atmosphere.
7. Maintain the lamphouse blower in good operating condition. Lubricate blower motor as required. Keep the blower inlet clean for unrestricted air flow.
8. To insure maximum bulb life, operate the lamphouse blower and the exhaust system for **at least** ten minutes after extinguishing the bulb.
9. If returning a bulb for warranty adjustment, pack it in its original shipping container. Complete and return all required warranty information.
10. Dispose of expired bulbs that are beyond warranty in the following manner: Wrap the bulb tightly in several layers of canvas or heavy cloth. Place it on a hard surface and shatter the envelope with a sharp hammer blow. DO NOT place an unshattered bulb in an ordinary refuse container.
11. DO NOT PERMIT UNAUTHORIZED PERSONNEL TO PERFORM OR ATTEMPT ANY PHASE OF XENON BULB HANDLING OR SERVICE.



LUME-X "DLP" XENON BULBS

THE FOLLOWING BULBS may be used in the Lume-X "DLP" lamphouse. Refer to the bulb manufacturer's information packed with the bulb regarding the recommended operating current and do not exceed the maximum allowable current level.

THE LUME-X LAMPHOUSE is designed for a maximum wattage of 2500 watts. While the 3000 watt Type "HS" offered by some manufacturers will mechanically mount into the Lume-X, the cooling of the Lume-X lamp is *not* rated for 3000 watt operation, and manufacturers of 3000 "HS" bulb will *not* allow warranty credit for 3000 watt bulbs if used in Lume-X lamphouses.

Wattage	OSRAM	LTI	ORC	Hanovia	Christie
500	XBO500W/H OFR	LTIX-500W-H	XM500HS	XH0500HS	CXL-500H
700	XBO700W/HS OFR	LTIX-700W-HS	XM700HS	XH0700HS	CXL-7S
1000	XBO1000W/HS OFR	LTIX-1000W-HS	XM1000HS	XH1000HS	CXL-10SC
1600	XBO1600W/HS OFR	LTIX-1600W-HS	XM1600HS	XH1600HS	CXL-16SC
2000	XBO2000W/H OFR	LTIX-2000W-HC	XM2000H/VC	XH2000HW	CXL-20R
2000*	XBO2000W/HS OFR	LTIX-2000W-HS	XM2000HS	XH2000HS	CXL-20SC
2500	XBO2500W/HS OFR	LTIX-2500W-HS	XM2500HS	XH2500HS	CXL-25SC

* 2000 watt horizontal bulbs are also available from the above manufacturers in a "short" version designated as Type "HS." The 2 kW Type "HS" bulb is mechanically interchangeable with the 2500 watt "HS" bulb and requires the same Support Collet and Anode Clamp as the 2500 watt bulb.

SOME MODELS of the above xenon bulbs are supplied from the manufacturer with an anode lead. This lead may be attached to the anode end cap, or packed loose in the bulb's shipping box. To prevent the risk of short circuiting, the use of the bulb manufacturer's anode lead is not recommended; all required electrical connectors are supplied with the Lume-X lamphouse.

IF THE BULB IS RECEIVED with the lead attached to the anode end cap (normal with 2000, 2000 "HS," and 2500 watt bulbs), the lead may be removed by unscrewing it from the end cap. Leaving the bulb in its protective plastic cover, grasp the anode (+) end cap and, using small channel locks or slip-joint pliers, grip the anode lead at or near the threaded fitting. The crimp joint near the fitting provides a good gripping point. Turn counterclockwise to unscrew. To avoid applying stress to the quartz envelope, *do not* hold the bulb by the cathode (-) end cap for this operation!

LUME-X "DLP" LAMP CHART

REFER TO THE FOLLOWING TABLE of adapters for the parts required relative to the use of the various types and wattages of bulbs used in the Lume-X lamphouse. Bulbs not listed on the chart have not been factory tested in the Lume-X, and may not be suitable for use. If using a bulb not listed on the chart, check with the bulb supplier regarding its compatibility in the Lume-X.

THE 2500 WATT HORIZONTAL, and the "short" 2000 bulbs (-HS suffix), require use of an 8mm I.D. cathode support collet (Item 11), a different cathode contact clamp (Item 10), a different anode contact (Item 4), and an anode support with a height-adjustable yoke (Items 7, 8, and 9). These components are factory-mounted when lamps are specifically ordered for 2500 watt operation.

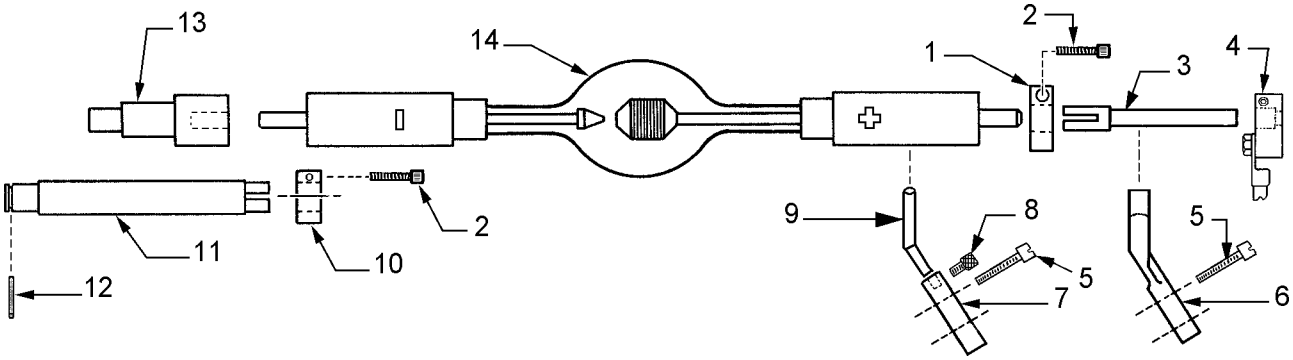
IF CHANGING BULB WATTAGE after the initial installation, the anode supports (Item 6 and Items 7-9) are interchangeable and use the same mounting screws. See the following table for the relevant part numbers.

TO REPLACE THE CATHODE SUPPORT COLLET, slide the cathode contact clamp (Item 9) located inside the lamphouse from the end of the support collet. Remove the cover panel from the rear of the lamphouse and locate the black snap ring (Item 12) on the end of the white support rod (Item 10). Remove the snap ring, and pull the support rod out of the focus control from inside the lamphouse. Dismount the anode and cathode clamps and retain the fasteners. Replace the anode and cathode clamps using the same hardware.

STANDARD 2000 WATT HORIZONTAL BULBS (i.e. OSRAM XBO2000W/H OFR) require no bulb adapters to mount in the Lume-X. Loosening the thumb screw (Item 8) allows raising or lowering the yoke (Item 9) to accomodate different end cap diameters used by bulb manufacturerers. The anode contact on the end of the positive lead (Item 4) should be attached directly to the anode (+) pin. Using the anode lead supplied with the bulb greatly increases the possibility of a short circuit because of the limited area inside the Lume-X lamphouse.

BULBS smaller than 2000 watt require adapters (Items 1, 3, and 13) to correctly position the arc at the reflector's focal point. Slip the loosened anode clamp (Item 1) over the slotted end of the anode adapter (Item 3) before installing the adapter to the anode pin. Securely tighten the clamping screw (Item 2). The cathode adapter (Item 13) is threaded 5/16-18 to accommodate the threaded cathode pin on 500-1600 watt "HS" bulbs. Screw the adapter onto the cathode pin and tighten securely while gripping the cathode end cap. Do not apply stress to the quartz envelope by holding the anode end cap while tightening the cathode adapter.

LUME-X "DLP" BULB ADAPTER CHART



1. Anode Clamp
2. Clamping Screw
3. Anode Adapter
4. Anode Clamp
5. Mounting Screw
6. Anode Support Yoke (500-1600 W.)
7. Yoke Mounting Block (2000, 2500 W.)
8. Thumb Screw
9. Anode Support Yoke (2000, 2500 W.)
10. Negative (Cathode) Clamp
11. Cathode Support Collet
12. Snap Ring
13. Cathode Adapter
14. Xenon Bulb *supplied by Customer*

BULB WATTAGE	500	700 1000 1600	2000	2500 "HS" 2000 "HS"
Item				
1	65343	65343	*not req'd.*	*not req'd.*
2	4080870	4080870	4080870	4080870
3	7200144	65344	*not req'd.*	*not req'd.*
4	65148	65148	65148	65400
5	4110501	4110501	4110501	4110501
6	65117	65117	*not req'd.*	*not req'd.*
7	*not req'd.*	*not req'd.*	7200125	7200125
8	*not req'd.*	*not req'd.*	65151A	65151A
9	*not req'd.*	*not req'd.*	7200123	7200123
10	65131	65131	65131	65265
11	65960	65960	65960	65924
12	2148027	2148027	2148027	2148027
13	7200145	65169	*not req'd.*	*not req'd.*

XENON BULB INSTALLATION

CAUTION: OBSERVE ALL SAFETY PROCEDURES. Put on the protective face shield. Wear clean cotton gloves to prevent marking the quartz envelope with fingerprints. Use the special screwdriver provided to release the (4) tamperproof cover fasteners. The Lume-X is designed to operate with xenon bulbs rated from 500 to 2500 watts.

ADAPTERS required to permit use of the Type "HS" 700, 1000 or 1600 watt bulbs are furnished with each lamphouse when ordered for 700 to 2000 watt operation. Standard length 2000 watt bulbs require no bulb adapters, but utilize a different front bulb support assembly in place of the cast yoke (65117) used for the smaller bulbs. The 2500 watt bulb, and the 2000 watt "short" bulb, use the same front bulb support assembly as the standard 2000 watt bulb (83747), but requires a different rear collet assembly (65924), cathode clamp (65265), and anode clamp (65400).

REMOVE THE PLASTIC PROTECTIVE COVER from the xenon bulb only if necessary. If the bulb envelope should accidentally become fingermarked, the marks must be removed with isopropyl alcohol and wiped clean. Skin oils from fingerprints will permanently burn into a bulb envelope if not removed.

500 - 1600 Bulb Watt Installation:

ASSEMBLE THE ADAPTERS to the bulb before insertion into the lamphouse and while the bulb is still in its protective casing. Be very careful to *not* put any strain or torque on the quartz envelope when assembling the adapters to the bulb. Slide the cathode clamp at the end of the igniter lead onto the brass socket portion of the rear bulb support collet.

INSERT THE BULB into the lamphouse passing the cathode (-) end into the reflector and through the center hole. Take care not to touch or scratch the surface of the reflector. Insert the adapter stem into the rear support collet as far as possible to permit full focus travel of the bulb.

TIGHTEN THE SOCKET HEAD CLAMPING SCREW in the cathode contact clamp securely to insure a good electrical connection. Rest the anode adapter stem in the front bulb support yoke casting.

INSTALL THE ANODE (+) lead contact clamp over the front end of the adapter stem only up to the shoulder of the contact. Tighten the socket head clamping screw securely to provide a secure electrical connection. Dress the positive lead in front of the air duct casting to minimize its projected shadow.

REMOVE THE PLASTIC PROTECTIVE COVER from the xenon bulb. Store the cover in a secure location in the projection booth for subsequent re-use.

XENON BULB INSTALLATION (continued)

2000 & 2500 Watt Bulb:

SLIDE THE CATHODE CLAMP at the end of the igniter lead onto the brass socket portion of the rear bulb support collet. Insert the bulb through the top of the lamphouse, passing the cathode (-) end through the hole in the reflector. Insert the cathode pin into the socket of the bulb support collet and firmly tighten the clamping screw. Rest the anode (+) end cap in the "V" of the front support yoke. Slide the positive contact clamp over the anode pin and tighten securely.

THE THUMB SCREW securing the front bulb support yoke to its mounting block can be loosened to permit adjusting the height of the yoke. If the outside diameter of a new bulb's end cap is larger or smaller than that of the old bulb, the yoke may be raised or lowered to allow centering the arc in the center hole of the reflector.

NOTE that while the standard 2000 watt bulb and the 2000 watt "HS" bulb share identical electrical characteristics, they are *not* mechanically interchangeable. The 2000 watt "HS" bulb is, however, mechanically interchangeable with the 2500 watt "HS" bulb.

	Anode Pin Diameter	Pos. Clamp Part No.	Cathode Pin Diameter	Cathode Collet Part No.	Neg. Clamp Part No.
Standard 2 kW Bulb	.394"	65148	.472"	65960	65131
2.5, 2 kW "HS" Bulb	.375"	65400	.312"	65924	65265

All Wattages:

IT IS RECOMMENDED to establish a routine of periodically checking all electrical connections, particularly those in the DC circuit, for tightness. Loose connections at or near the bulb or its adapters will overheat, causing damage to the leads or contacts, and may destroy the xenon bulb.

MAGNETIC STABILIZATION of the xenon arc is provided by the bar magnet mounted below the reflector. This magnet is factory set and requires no adjustment. If removed for any reason, the magnet must be replaced with the SOUTH (painted) pole pointed toward the operator's side. If reversed, the arc will burn off-center and bulb ignition will be impaired.

INITIAL OPERATION

REMOVE THE PLASTIC COVER from the xenon bulb. Do not ignite the lamp with the cover on the bulb.

SECURE THE LAMPHOUSE ACCESS COVER with the (4) tamperproof screws. The top and operator's side covers must be secured in place to actuate the cover interlock switches and permit lamp ignition. Close the lamphouse douser and place the MODE switch in the "MAN." (manual) position.

TURN ON THE MAIN LINE SWITCH to energize the xenon power supply. The lamphouse blower will start, and the air flow interlock switch will close, permitting lamp ignition. The lamphouse blower will operate continuously as long as the xenon power supply is energized.

TURN ON THE EXHAUST FAN. Place the "LAMP" switch on the "ON" position and the bulb will ignite.

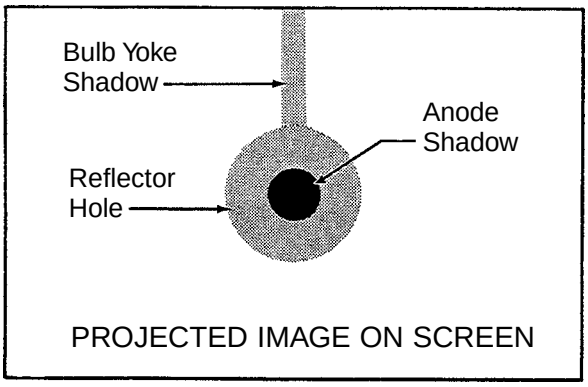
OPERATING CURRENT is displayed on the ammeter located on the instrument panel at the rear of the lamphouse. The pushbutton switch directly below the ammeter may be pressed while the lamp is operating to convert the meter reading to indicate the DC voltage at the arc. This permits immediate calculation of the power at which the lamp is operating (volts x amperes = wattage). Holding the switch button in during the ignition cycle will also briefly display the open circuit ("no load") DC voltage applied to the xenon bulb for ignition.

DO NOT, at any time, exceed the maximum current recommended by the xenon bulb manufacturer. Always adjust power supply output to first operate a new bulb at the suggested nominal current, which is approximately 85% of the maximum level established by the bulb manufacturer. Most xenon power supplies have the capability to overdrive any rated xenon bulb. See the power supply manual for the correct means of adjusting current output.

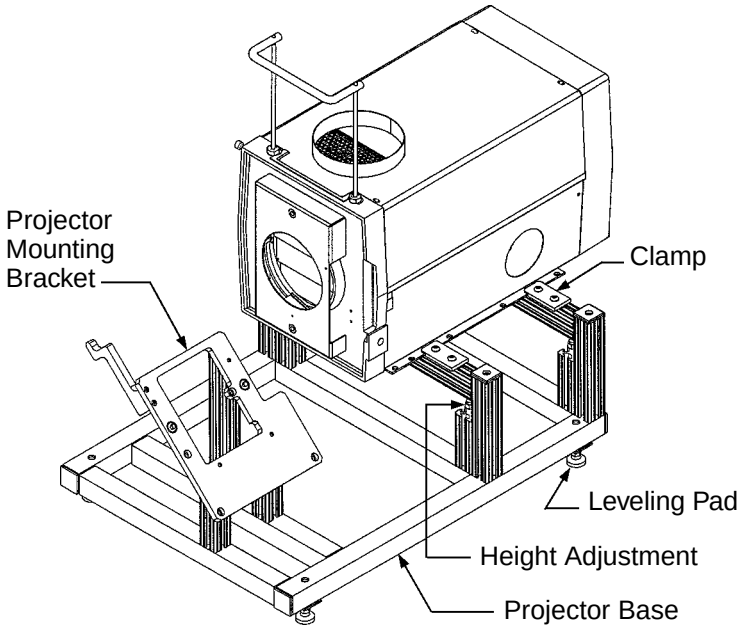
Bulb Wattage	**Nominal Current**	**DO NOT EXCEED**
500	28 A.	33 A.
700	36 A.	40 A.
1000	50 A.	58 A.
1600	65 A.	70 A.
2000	75 A.	90 A.
2500	90 A.	100 A.

INITIAL OPERATION (continued)

BEFORE MOUNTING THE PROJECTOR, open the lamphouse douser and project a white light to the screen. *Exercise extreme caution during this procedure;* intense heat is present in the light beam, and skin and clothing can burn rapidly if held in the light beam. It is furthermore *mandatory* to wear the UV protective goggles supplied in the lamphouse accessory kit when performing this operation. *Do not* look into the front lamphouse opening, and advise bystanders to look away from the lamphouse.



IF THE IMAGE is not centered on the screen, as illustrated above, move the pedestal or adjust the lamphouse/projector tilt to correct. Note that the initial projected image will not be as focused and distinct as that pictured.

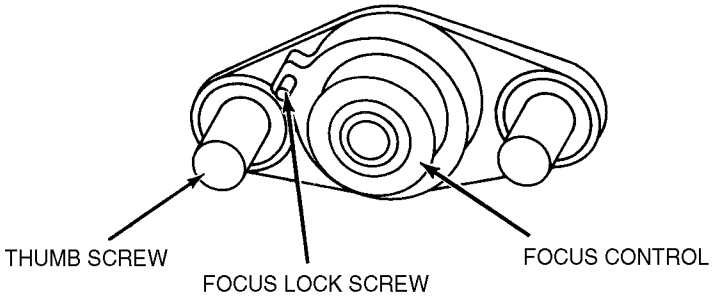


A TYPICAL LAMPHOUSE TABLE or projector base affords various means of adjusting the position of the lamphouse to direct the light beam. Refer to instructions supplied with the equipment if the means of adjustment are not apparent.

INITIAL OPERATION (continued)

REMOVE THE REAR COVER PANEL using the two pull-type knobs to expose the bulb position adjustment controls.

BULB ADJUSTMENT CONTROLS



THE CENTER SECTION of the control is a threaded member that focuses the bulb in relation to the reflector. Turning this adjustment moves the bulb in only one plane, into or away from the reflector. Clockwise rotation moves the bulb **away** from the reflector. The small knurled screw to the left of this section can be tightened to lock the focusing mechanism, after the following procedures have been completed.

THE THUMB SCREWS on either side of the focusing control lock the horizontal and vertical adjustment mechanism in position.

TURN THE CENTER FOCUSING SECTION of the bulb positioning control until the smallest black spot obtainable is focused on the projection screen. It may be best to run this adjustment both directions to permit positive identification of the spot. The position of the spot may be to the right, left, top or bottom of the screen, and not necessarily at the center.

LOOSEN the two thumb screws, one on either side of the focusing section just enough to permit manual movement of the complete assembly. The bulb adjustment control will now move about these two thumb screws, and as this control is shifted, the smooth shadow of the electrode can be seen extending beyond the projected hole in the reflector. The electrode shadow must be centered in the projected hole of the reflector.

MOVE THIS CONTROL SECTION around the two thumb screws until the black spot is as round as possible to project. It may be necessary to again adjust the focus control to project a sharp spot. After the black spot is as even around the outside as possible to project, tighten the two thumb screws to lock the adjustment section. This adjustment has now centered the projected image of the electrode shadow and the hole in the reflector on the aperture and screen.

THIS ADJUSTMENT should not be disturbed until it is necessary to replace or rotate the xenon bulb. Then, only the bulb adjustments outlined above may have to be repeated; do not disturb or adjust the optical alignment of the lamphouse on the projector table.

REPLACE THE REAR COVER PANEL over the bulb adjustment control mechanism. Secure with the two plungers.

CLOSE THE LAMPHOUSE DOUSER and extinguish the xenon bulb by placing the LAMP switch in the OFF position. Install the digital projector to the mounting bracket in front of the lamphouse. Make all electrical connections as specified by the projector manufacturer. Energize the projector and select a "100% White" test pattern. Ignite the xenon bulb and open the lamphouse douser. Maximize the screen illumination according to the projector manufacturer's instructions.

BECAUSE OF MANUFACTURING TOLERANCES on any given xenon bulb, and normal aging, it may be necessary to operate one lamp of a two-machine installation at slightly higher or lower current to obtain equal light balance on the screen. This is done by adjusting the output of the xenon power supply. It is also a normal practice to increase current to compensate for reduced light output as the bulb darkens. Current may be increased to, but not exceeding, the maximum level specified by the bulb manufacturer.

TO EXTINGUISH THE ARC, place the LAMP switch in the "OFF" position. The lamphouse blower will continue to operate until the main line switch in the AC power line to the xenon power supply is opened. To prolong bulb life, leave the lamphouse blower and the exhaust fan operate for at least ten minutes after turning off the lamp.

RECORD THE INSTALLATION of each xenon bulb on the Xenon Bulb Record chart located on the back cover of this manual. It is recommended to replace the bulb on expiration of warranty. In the event of a bulb explosion, the reflector might sustain damage, and if the subject bulb is out of warranty, the bulb manufacturer will allow *no credit* on a replacement reflector.

RETURN BULBS on which a warranty claim is being made to the theatre equipment dealer through whom the bulb was purchased. Pack the bulb in its original shipping carton with the protective cover over the bulb. Complete and enclose all warranty forms supplied by the bulb manufacturer.

DAMAGED REFLECTORS should be forwarded to the **bulb** manufacturer or dealer, with an invoice copy authenticating the replacement cost.

MAINTENANCE

THE LUME-X LAMPHOUSE requires very little maintenance to keep it in good working order. Cleanliness is the most important element.

THE REFLECTOR should be cleaned periodically with a soft, clean, lint free cloth to remove any dust from the reflecting surface. If excessively soiled, use of a mild commercial glass cleaner (Windex® or equivalent) is acceptable; USE NO ABRASIVE CLEANERS.

THE XENON BULB should be checked occasionally for the presence of any foreign material on the envelope. Any dirt or other foreign material should be removed promptly. Use only alcohol and a clean cloth to clean the bulb; rinse with distilled water and dry carefully. DO NOT touch the bulb with bare fingers, and observe all safety procedures when working around the bulb.

THE INSIDE OF THE LAMPHOUSE and the impeller blades of the blower should be cleaned periodically, depending on the dust conditions at each installation. The grille over the air intake can be removed for cleaning without dismounting the blower; do not allow dirt or dust to build up on the grille or in the fan impeller.

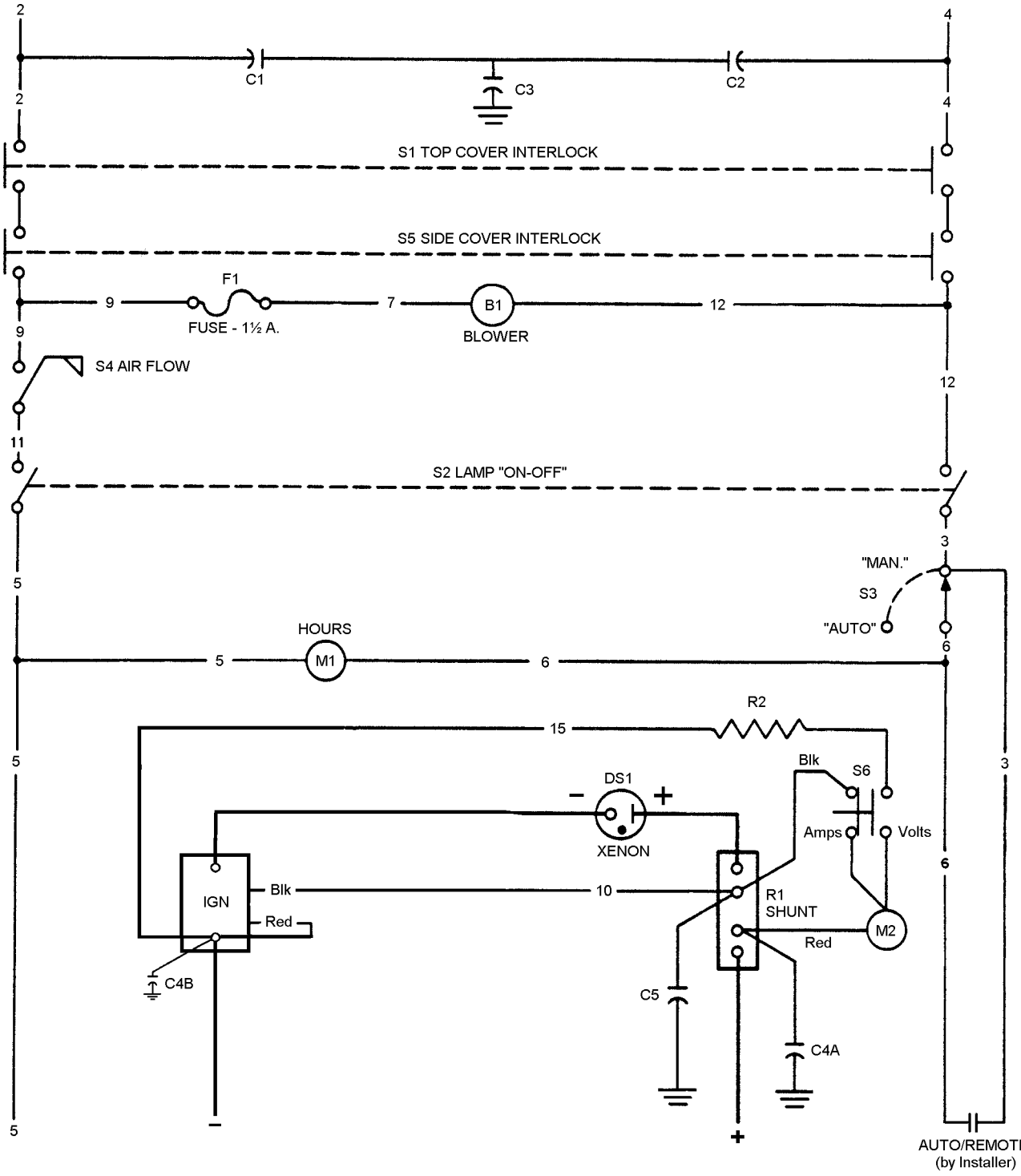
THE XENON LAMPHOUSE does not require any lubrication other than at the blower. This should be lubricated with two or three drops of non-detergent motor oil every four to six months. The oil holes are marked and located on the top of the blower motor.

CHECK ALL ELECTRICAL CONNECTIONS periodically for tightness, especially the DC leads at the xenon bulb and at the shunt and igniter.

FOLLOW THE RECOMMENDATIONS of the xenon bulb manufacturer regarding periodic bulb rotation. It is a general practice to rotate the bulb 180° at 50% of warranty life. After rotating a bulb, increase current to the maximum allowable level. Operate the bulb at this level for three or four shows and then reduce the current to its previous setting. Temporary operation at high current restores the cathode tip and enhances bulb ignition at the new arc position.

ALWAYS allow the lamphouse blower and the exhaust system to operate for *at least* ten minutes after extinguishing the bulb. Failure to do so will shorten bulb life.

LAMPHOUSE SCHEMATIC



PARTS LIST
Schematic Diagram

Ref. Desig.	Part No.	Description
B1	39938	Blower Assembly, 120 V.AC, 50/60 Hz. (with F1)
C1	76132	Capacitor, .005 µf, 600 WVDC
C2	76132	Capacitor, .005 µf, 600 WVDC
C3	76133	Capacitor, .01 µf, 400 WVDC
C4A,B	80177	Capacitor, 1.0-1.0 µf, 600 WVDC
C5	81947	Capacitor Assembly, .01 µf, 500 WVDC
C6,7	88263	Capacitor, .05 µf, 600 WVDC
C8	39956	Capacitor Assembly, .05 µf, 1200 VDC
DS1	—	Xenon Bulb (by Customer)
F1	39198	Fuse, 1.5 A. Standard
-	39199	Fuseholder (included with B1)
IGN	65503	Igniter Assembly
M1	39920	Elapsed Time Meter (60 Hz.)
M1	65325	Elapsed Time Meter (50 Hz.)
M2	65142	Ammeter
R1	82167	Shunt
R2	39151	Resistor, 150k Ohm, ½ Watt, 5% (Order 21-46059)
S1	80168	Switch, Top Cover Interlock
S2	81275	LAMP Switch (ON - OFF)
S3	81276	MODE Switch (AUTO - MAN.)
S4	85109	Switch, Air Flow (60 Hz.)
S4	39955	Switch, Air Flow (50 Hz.)
S5	80168	Switch, Side Cover Interlock
S6	39970	Switch Assembly, Voltage Test (with R2)

TROUBLE CHART

NOTE: When working inside the lamphouse, enclose the bulb in its protective covering and/or wear protective clothing and face shield.

ALLOW THE LAMPHOUSE to cool, with all blowers operating, for at least (20) minutes before opening the top cover. Do not touch the quartz envelope of the bulb with bare fingers.

NORMAL OPERATION:

When the switch in the main AC supply line to the xenon power supply is placed in the "ON" position, with the door interlock switch closed, the lamphouse POWER light will glow and the lamphouse blower will operate. The lamphouse blower will close the S4 air vane switch, completing the circuit to the S2 LAMP "ON-OFF" switch.

Place the lamphouse MODE switch S3 in the "MAN." position. When the lamphouse LAMP switch S2 is in the "ON" position, the elapsed time meter will operate and the AC circuit (5 - 6) to the xenon power supply will energize the circuitry necessary to supply DC voltage to the igniter and bulb.

There will be an audible high voltage arc ping at the spark gap in the igniter and at the xenon bulb. The bulb should ignite immediately after one or two of these high voltage pulses, and the lamp current will adjust to the sustaining level set at the xenon power supply.

TROUBLESHOOTING:

If the xenon bulb does not ignite, observe the following operational sequences for assistance in locating and isolating the trouble area.

Green indicator lights on the xenon power supply show that the AC circuit in the power supply is trouble free up to the terminal block (L1, L2, L3) in the power supply.

The blower in the lamphouse should operate. If this does not occur, the trouble is in either the cover interlock switches, the blower, a loose connection, a broken #2 or #4 lead, or a defective stepdown transformer in the xenon power supply. The Lume-X has an in-line fuse in the blower lead; check the fuse and replace if blown. Do not overfuse; use 1.5 A. standard.

Check the 115 V.AC control circuit in the lamphouse at the interlock switches, then the blower leads at terminals #9 and #12. The top cover interlock switch must be manually actuated to energize the blower circuit.

The vane on the air flow switch should move, completing the circuit to the LAMP switch. With the MODE switch in the "MAN." position, and the LAMP switch in the "ON" position, the elapsed time meter should start to indicate elapsed time. If this meter does not operate, check for continuity at the LAMP and MODE switches. Check continuity of the air flow switch; should read zero Ohms between "NO" and "COM" when actuated. A defective elapsed time meter will **not** prevent bulb ignition.

With the LAMP switch in the "ON" position, a distinct high voltage arc ping at the igniter spark gap should be heard, and a flash from the xenon bulb should be visible through the ammeter, as DC voltage is applied to the bulb electrodes.

If the high voltage ping or the flash at the ammeter is not apparent, check the DC "No Load" voltage between the lamphouse and power supply. Press the switch below the ammeter, and the meter will indicate the "No Load" DC voltage supplied to the lamphouse when the LAMP switch is turned "ON." This voltage will vary between different types of power supplies. See your power supply manual for its correct "No Load" rating.

If the correct open circuit voltage for the power supply being used is not indicated on the meter, the problem is in the lamphouse/power supply interconnecting cable, or in the power supply. See the troubleshooting guide in the power supply manual for additional instructions and tests.

- If the high voltage arc is audible at the lamphouse, and the bulb does *not* flash, replace the bulb and attempt ignition with the new bulb.

- Using the new bulb, if the high voltage arc is audible at the lamphouse, the flash of the bulb is visible in the ammeter, and ignition is *not* sustained, the problem is in the power supply.

- If the high voltage arc is *not* audible or the flash of the bulb visible, the trouble is in the igniter.

LUME-X TROUBLESHOOTING

WARNING: Exercise Caution when reading voltages in a power ON condition.

Bulb fails to ignite

1. AC power not on to lamphouse. If 115 V.AC not read at 2 & 4, see power supply manual.
2. Top cover interlock switch S1 or side cover interlock switch S5 open. Close and secure lamphouse covers. Tighten all fastening screws.
3. Faulty cover interlock switch. Check for 115 V.AC at 9 & 12; replace switch if defective.
4. Air vane switch S4 not closing. Check for unobstructed operation; clean if required. Check continuity between "NO" and "COM"; replace if defective.
5. Faulty S2 "ON-OFF" switch. Check for voltage at 3 & 5; check for loose wiring. Replace if defective.
6. Automation fault. Override automation by switching MODE to "MAN." and placing LAMP switch in "ON."

Bulb fails to ignite; ping audible, bulb flash visible

1. Inadequate DC output from xenon power supply. Set power supply output to correct range required for bulb wattage.
2. Faulty or expired xenon bulb. Replace as required.

Bulb fails to ignite; ping audible, no bulb flash

1. Faulty xenon bulb. Check for cracked electrodes or darkened envelope. Replace if defective.
2. Ignition pulse shorting to ground. Inspect DC leads for burned insulation; dress leads away from grounded metal components.

No high voltage ping audible; MODE switch in "MAN." and LAMP switch in "ON"

1. Loss of AC control voltage. Check xenon power supply for tripped circuit breaker or open thermal switch. See power supply manual.
2. Little or no DC "No Load" voltage. Measure DC "No Load" voltage at 10 & 15. See power supply manual.
3. Faulty igniter. Check for adequate DC "No Load" at 10 & 15. Replace igniter if defective.

Bulb goes out during operation

1. Xenon power supply overheated; thermal switch open. Check power supply blower(s), air inlets and outlets unobstructed. See power supply manual.
2. Lamphouse blower B1 failed or obstructed. Clean dust and dirt from blower inlet grille. Check for 115 V.AC at 9 & 12; replace blower if defective.

Bulb goes out during operation (continued)

3. Blower fuse F1 blown. Replace if defective (1.5 A. Std.).
4. Lamphouse air vane switch S4 faulty. Check for vane actuation; adjust or replace as required.
5. Backdraft from exhaust system. Check exhaust system installation; increase exhaust draft as required.
6. Switching-type power supply interlock: AC voltage surge or drop, phase loss. See power supply manual.
7. Defective xenon bulb. Check for discolored envelope or scorched electrodes; high current and low voltage may indicate seal leakage.

Power supply does not energize when actuated

1. S1 & S5 cover interlock switch, B1 blower, S4 air vane switch, S2 power switch, S3 MODE switch. Check for 115 V.AC at each station; replace defective component.
2. Automation fault. Check for continuity between 3 & 6. See Automation Controller manual. Use "MAN." mode to override.

SEE POWER SUPPLY TROUBLESHOOTING UNDER SAME HEADING.

Noise in theatre sound as bulb ignites

1. Faulty RF suppression capacitor(s). Remove and test C1, C2, C3, C4A or C4B. Replace if defective.
2. Lamphouse, power supply, or sound system not properly grounded. Connect to adequate earth ground.
3. Leads between lamphouse and automation contact not shielded. Shield leads in conduit.

Excessive light flicker

1. Faulty or aged bulb. Check for cracked or sagging electrodes; replace if defective.
2. Excessive ripple in DC output. See power supply manual.
3. Projector malfunction. See projector manual.

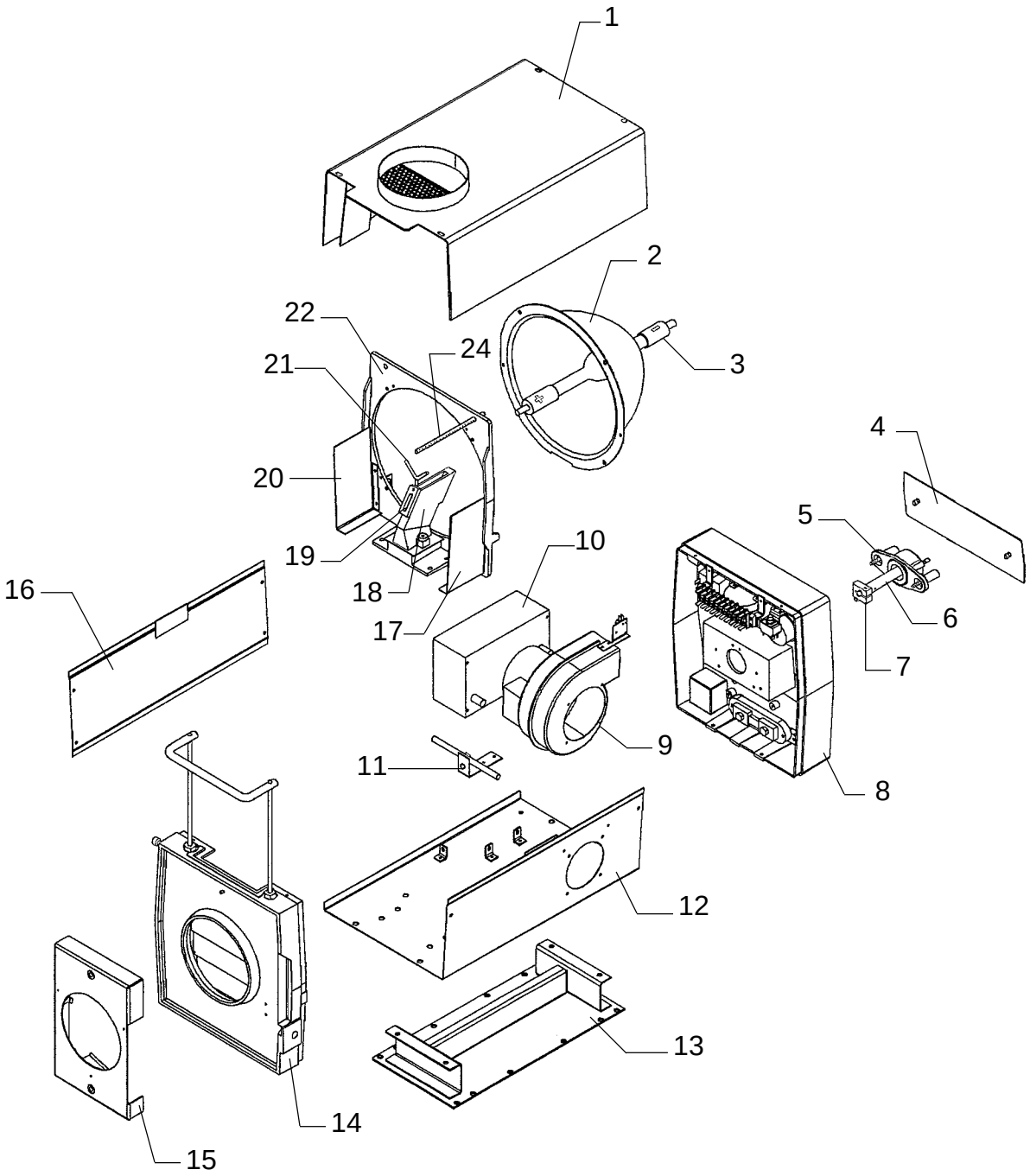
Reduced light output

1. Normal bulb aging. Increase output current. DO NOT EXCEED MAXIMUM CURRENT SPECIFIED BY BULB MANUFACTURER.
2. Defective seals on bulb. Check for discolored envelope and low arc voltage.
3. Soiled reflector. Clean using commercial glass cleaner. USE NO ABRASIVES.
4. Soiled projection lens or port glass. Clean as required.

Extremely long duration between ignition pulses

1. Low DC “No Load” from xenon power supply. Check “No Load” voltage; see power supply manual.
2. Defective spark gap E101. A “Ping” sound is normal; excessive “Hissing” is abnormal. Replace if defective.
3. Low AC voltage to lamphouse. Check for 115 V.AC at 2 & 4; if below 95 volts, check stepdown transformer in xenon power supply. See power supply manual.

FIGURE 1



PARTS LIST
Figure 1

Item	Part No.	Description
1	65896	Top Cover, Welded Assembly
-	4100502	Tamperproof Screw, 10-32 x 1/2" Holt Head
-	4107104	Flatwasher, #10
2	25588	Reflector, 10" Flanged
-	4250505	Screw, 1/4-20 x 1/2" Socket Head
-	4257004	Lockwasher, 1/4"
3	—	Xenon Bulb (DS1), supplied by Customer
4	65968	Bulb Adjustment Cover Panel Assembly
-	65140	Cover Plate
-	65166	Plunger, Black Plastic
-	65167	Grommet, Black Plastic
5	65827	Bulb Adjustment Mechanism (less Item 6 Collet)
6	65960	Rear Bulb Support Collet; 500 - 1600 Watt, 2000 Watt Standard
6	65924	Rear Bulb Support Collet; 2000 & 2500 Watt type “HS”
-	21-48027	Snap Ring, Collet Retaining
7	65131	Cathode Clamp; 500 - 1600 Watt, 2000 Watt Standard
7	65265	Cathode Clamp; 2000 & 2500 Watt type “HS”
-	4080870	Clamping Screw, 8-32 x 7/8" Socket Head
8	7200033	Rear Casting Assembly (see Figure 2)
9	39938	Blower & Fuse, Wired Assembly (includes Switch Bracket)
-	85109	Air Vane Switch (S4), Order 39955 for 50 Hz.
-	4040500	Switch Mounting Screw, 4-40 x 1/2"
-	39198	Fuse, 1½ A. Standard
-	39199	Fuseholder, In-Line
10	39862	DC Pulse Igniter Assembly
-	39875	Igniter Case & Coil, Potted Assembly
-	62-87004	Igniter Printed Circuit Board Assembly
-	65387	Igniter Mounting Foot (3 req’d.), shown on Item 12
-	65966	Igniter Lead & Clamp Assembly
11	65847A	Arc Stabilization Magnet & Bracket Assembly
-	39215	Permanent Magnet (install with *painted* end toward *operator’s* side)
-	65409	“L” Bracket
-	11-10004	Magnet Clamp
12	65865	Base Pan, Welded Assembly
13	65969	Base Adapter Assembly

PARTS LIST, Figure 1 (continued)

Item	Part No.	Description
14	7200096	Front Casting & Douser Assembly (see Figure 3)
15	39905	Heat Filter Retainer Bracket
-	4251751	Mounting Screw, 1/4-20 x 1-3/4" Hex Head
-	25567	Filter Ring, Welded Assembly (not shown)
-	40181	Glass Heat Filter, 5½" Diameter (not shown)
16	65864	Side Cover & Igniter Access Panel
-	4100502	Tamperproof Screw, 10-32 x 1/2" Holt Head
-	4107104	Flatwasher, #10
17	65155	Heat Shield, Left
-	4080310	Screw, 8-32 x 5/16" Pan Head
18	65115	Air Duct Casting
-	65175	Insulator Plate, Phenolic
-	4081000	Air Duct Mounting Screw, 8-32 x 1"
-	65171	Insulator Bushing, Mounting Screw
-	4087101	Flatwasher, #8
19	7200125	Mounting Black, Bulb Yoke (for 2, 2.5 kW “HS”)
-	4110501	Mounting Screw, 10-24 x 3/4"
20	65156	Heat Shield, Right
-	4080310	Screw, 8-32 x 5/16" Pan Head
21	7200123	Bulb Support Yoke (for 2, 2.5 kW “HS”)
-	65152A	Thumb Screw (not shown)
-	65117	Bulb Support Yoke (for 500-1600 Watt & 2 kW Standard), not shown
-	4110501	Mounting Screw, 10-24 x 3/4"
22	65114	Reflector Bulkhead Casting
23	65164	Bulkhead Tie Rod

65827 **Bulb Adjustment Assembly** (see Figure1, Item 5)

37985	Thumb Screw (2 req’d.)
15010	Compression Spring (2 req’d.)
65116	Casting, Adjustment Mechanism
65150	Fender Washer (2 req’d.)
65153	Focus Lockscrew
65154	Nylon Locking Ball
65959	Focus Screw & Bearing Assembly
21-48027	Snap Ring, Collet Retaining
*	Collet (see Figure 1, Item 6)

* Order separately; not included with 65827 Assembly.

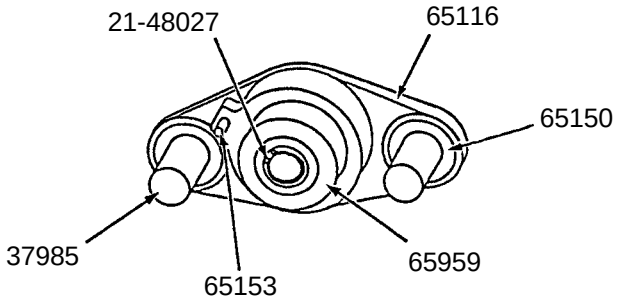
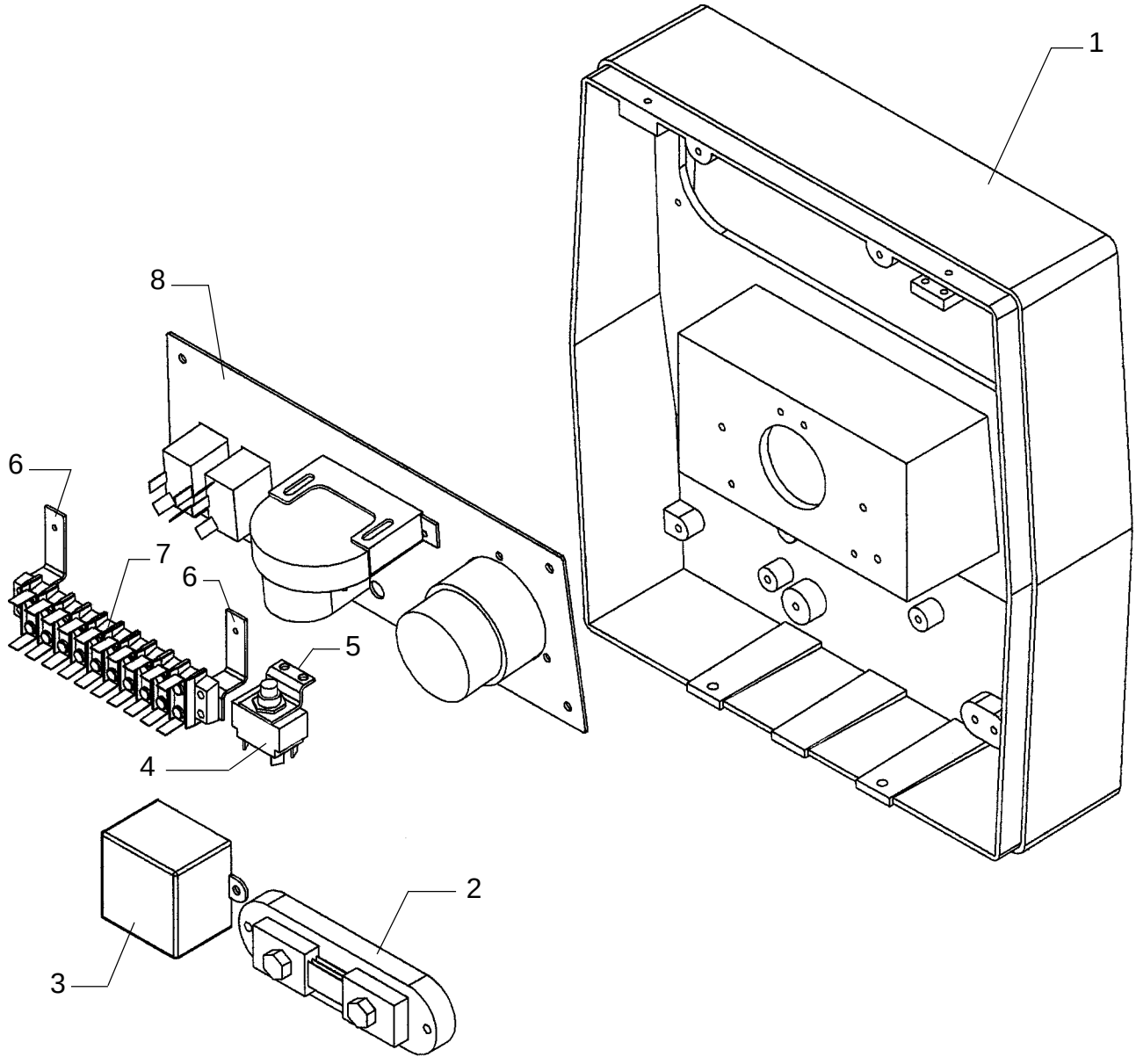
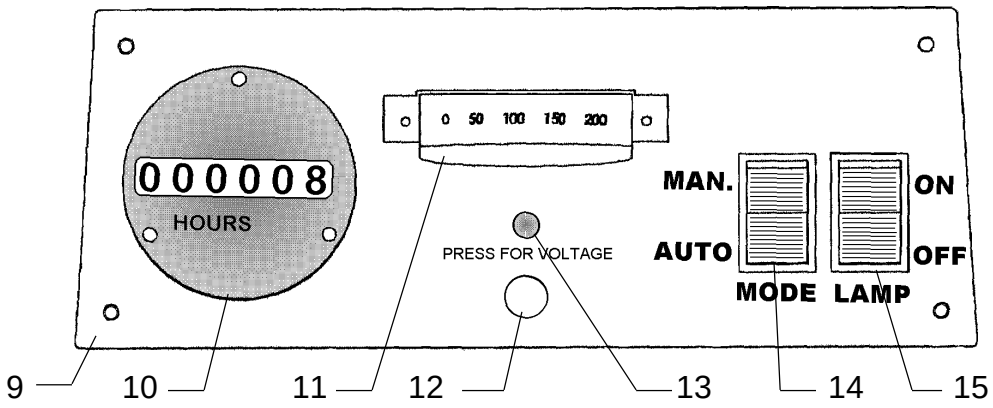


FIGURE 2



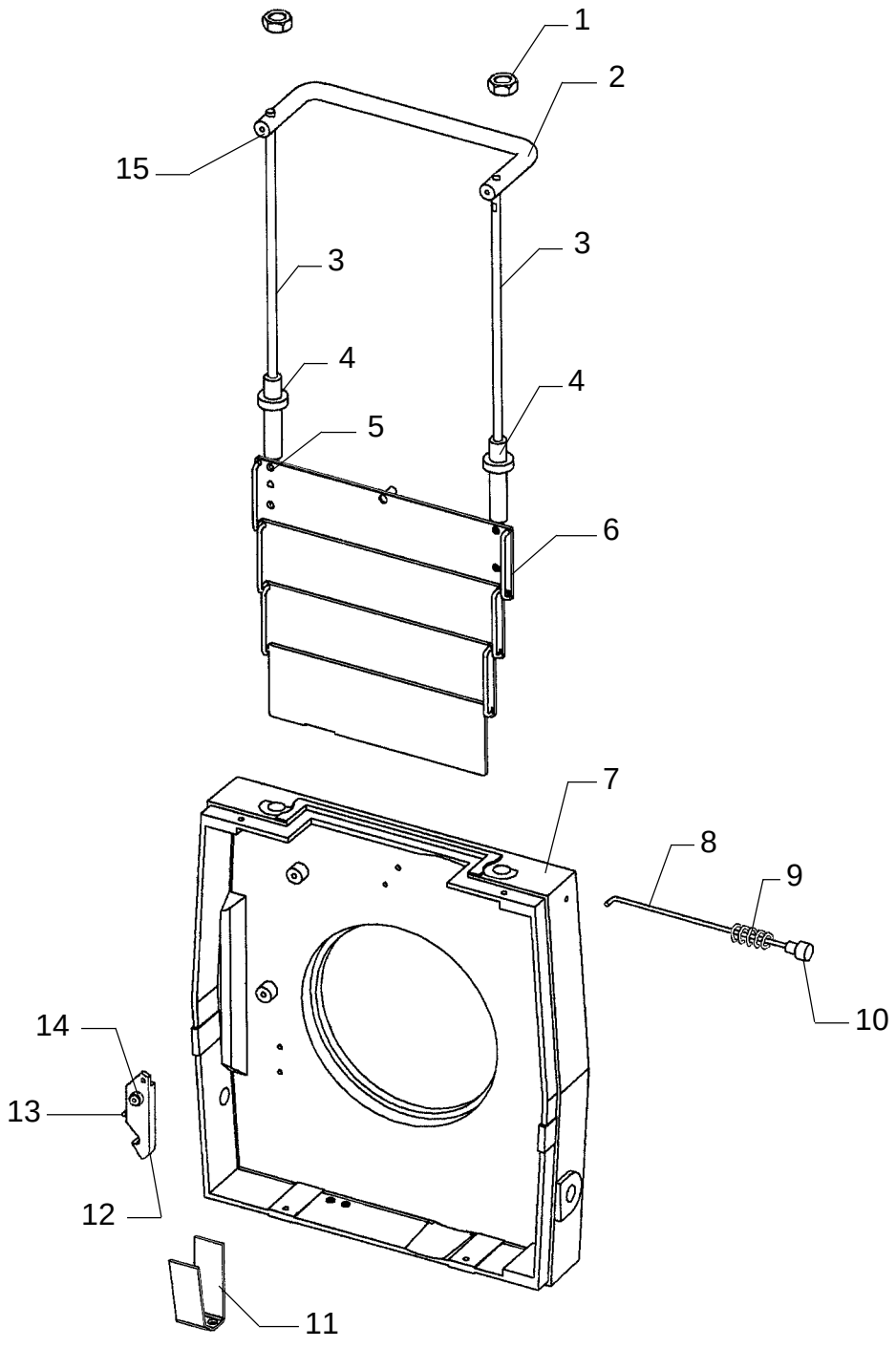
PARTS LIST
Figure 2

Item	Part No.	Description
1	65112	Rear Casting
2	82167	Shunt (R1)
-	4101004	Mounting Screw, 10-32 x 1" Pan Head
3	80177	Capacitor (C4A,B)
-	4100317	Mounting Screw, 10-32 x 3/8" Pan Head
4	80168	Top Cover Interlock Switch (S1)
5	65185	Switch Bracket
-	4080252	Mounting Screw, 8-32 x 1/4" Pan Head
6	65160	Barrier Strip Mounting Bracket
-	408037A	Mounting Screw, 8-32 x 3/8" Pan Head
7	65134	Barrier Strip, (10) Terminal
-	4060500	Mounting Screw, 6-32 x 1/2" Pan Head
8	65880	Instrument Panel Assembly (as shown)



9	65107	Plate, Instrument Panel (less components)
-	4080181	Mounting Screw, 8-32 x 3/16" Pan Head
10	65891	Hour Meter, 60 Hz. (M1)
-	65870	Hour Meter, 50 Hz. (M1)
11	65142	Ammeter (M2)
12	41-98013	Plug Button, Chromed
13	39970	Switch, Voltage Test (S6 & R2)
14	81276	Rocker Switch, MODE (S3)
15	81275	Rocker Switch, LAMP (S2)

FIGURE 3



PARTS LIST

Figure 3

Item	Part No.	Description
1	4518006	Jam Nut, 1/2-20 Hex
2	72-00102	Douser Handle
3	72-00100	Douser Operating Rod
4	72-00101	Douser Rod Guide Bushing
5	4040374	Screw, 4-40 x 3/8" Flat Head (4 req'd.)
6	72-00146	Segmented Douser Assembly
7	72-00117	Front Casting, DLP Lume-X
8	72-00113	Douser Release Rod
9	21-58019	Compression Spring
10	72-00114	Knob, Release Rod
11	72-00106	Douser Guide Bracket
-	4060252	Mounting Screw, 6-32 x 1/4" Flat Head (2 req'd.)
12	72-00115	Douser Catch
13	21-37008	Dowel Pin, 1/8 x 1/2"
14	41-51755	Shoulder Screw, 10-24 x 3/8"
15	4060256	Set Screw, 6-32 x 1/4" (2 req'd.)

XENON BULB RECORD

LAMPHOUSE TYPE ______________________ MACHINE NO. ____________

WATTAGE __________ NOM. CURRENT ______ AMPS. MAX. CURRENT ______ AMPS.

BULB		DATE LAMPHOUSE HOURS		
MFGR.	SERIAL NO.	INSTALLED	ROTATED	REPLACED