

Shadowgraph Lighting System Manual: SLS-500

**R-2495
Lamphouse**
8 ½" x 11 ¼" x 15"



**R-2120-3
Rectifier**
13" x 12 ½" x 24"

**R-2388-A
Leads**



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R-2120-3 POWER SUPPLY:

The power supply consists of a main transformer, two chokes, one 15,000 MFD, 100 Volt electrolytic capacitor, two silicon stacks, a built-in ignition device and blower. Located on the front panel are: a 30 ampere fuse, a pilot light, a 0-50 D.C. ampere meter, and an eight position rotary tap switch, a non-resettable elapsed time meter, a momentary contact switch, and an "ON/OFF" switch. The pilot light glows when the power supply is energized.

R-2495 LAMPHOUSE:

The R-2495 lamphouse is equipped with a specially designed 20 K.V. high voltage socket, to which is affixed an anode lead for attachment to the anode end of the xenon lamp. A ventilating fan is built into the side of the lamphouse, for the purpose of cooling the cathode and anode studs, maintaining low temperature on the lamp seals. This is conducive to long lamp life.

CONNECTING VENTILATING FAN TO POWER SUPPLY:

Seven-eighths inch diameter holes are provided in the top rear of the R-2120-3 power supply and in the side of the R-2495 lamphouse, for entry of "BX" cable to connect the fan. "BX" is not supplied as distance between lamphouse and power supply may vary in installation. Use 3 conductor "BX" and ground lamphouse to power supply case.

1. Connect "BX" wires firmly to AC connections on the terminal board inside the power supply.
2. Connect opposite ends of "BX" cable to the fan motor leads. With the motor electrically connected in this manner, the fan motor operates only when the entire lighting system is in operation. (Use wire nuts to connect motor leads).

INPUT CONNECTIONS:

A grounded Hubbell A.C. receptacle is affixed to the power supply rear panel (mating cord cap is supplied) for connection to any 25 ampere, 115 Volt A.C. power supply outlet. The A.C. lead is not furnished, as each installation would vary. We suggest that you use 10/3 rubber cover conductor.

D.C. CONNECTIONS:

Polarized jack pins, for D.C. lead connections, are visible through openings in the rear panel of the power supply. The lamphouse is also equipped with jack pins. Silicon rubber covered leads, for quick connection of the power supply and lamphouse, are equipped with jacks at both ends. The jacks are polarized, so that damaging reverse currents is impossible. Instant removal of the leads simplifies portability.



VOLTAGE AND CURRENT ADJUSTMENT:

The R-2120-3 Silicon Power Supply furnishes an output of 25/29.5 amperes at 17/20 volts from a line voltage of 105-125 volts. The rotary tap switch provides this adjustment. To increase the output current, rotate the switch clockwise; counterclockwise to reduce current. However, **settings over 29.5 amps can cause early bulb failure.** Current adjustment varies light intensity, no color.

IGNITION DEVICE:

The manual ignition is actuated by depressing the momentary contact switch located on the front panel of the power supply, directly above the pilot lamps. **Depress the switch button only enough to establish lamp ignition.** Once ignition takes place, release the button instantly. Repeated unnecessary ignition shortens lamp and ignition device life.

The ignition device contains an epoxy encapsulated first stage transformer and tesla coil for good dielectric strength. Tungsten spark gap contacts assure long life. There are no moving parts and maintenance should be at a minimum.

IMPORTANT: Do not operate with lamp load. If D.C leads are not connected at time of attempted ignition, arcing will occur between jack pins and housing, which can prove damaging to the power supply.



SAFETY PROCEDURES: Xenon Lamp

The Xenon bulb is under high internal pressure even at room temperature. When ignited, the temperature rapidly rises and the internal pressure of the bulb increases as much as 20 to 30 times atmospheric pressure.

The following precautions should be followed when handling xenon bulbs:

1. Refer bulb replacement and service to **QUALIFIED SERVICE PERSONNEL** wearing **protective clothing, i.e., face shield and goggles, leather gloves, and welder's jacket as recommended by bulb manufacturer.**
2. Do not open the lamphouse until the bulb has been permitted to cool to room temperature.
3. De-energize the A.C. input to the power supply and the lamphouse before opening the lamphouse.
4. When outside the lamphouse, enclose the bulb in its protective cover.
5. Do not look directly at the ignited bulb. To do so **COULD CAUSE BLINDNESS OR PERMANENT DAMAGE!** The glass being inspected should be tilted so that the light from the xenon bulb is not reflected into the eyes of the inspector, or the inspector should be positioned to avoid this reflection. **ALL PERSONEL WORKING WITH OR NEAR THE SHADOWGRAPH SHOULD WEAR EYE PROTECTION TO REDUCE ULTRAVILET (UV) EXPOSURE.** Suggested eyewear is Wilson Spectra Clear Polycarbonate # 11130031 which reduces UV by 95% or amber # 11130072 which reduces UV by 100% or equivalent. Wilson eyewear is available through W.W. Grainger, part no. 4T390 or 4T841 respectively. **Use of these glasses does not permit user to look directly at bulb or bulb outline on glass.**
6. Keep hands, clothes, and combustible material away from light beam to avoid burn hazard.
7. Fingerprints inadvertently left on the quartz envelope should be removed by using alcohol, distilled water, and cotton. (Wear protective clothing).
8. To discard a used or unwanted xenon bulb, put on protective clothing and wrap the bulb several times in layers of heavy canvas or some other heavy material. Smash the bulb by placing a heavy board over the wrapped bulb and stand on it. Do not discard the bulb without first smashing it.



SAFETY EQUIPMENT AND SUPPLIES

The face shield supplied with this unit is designed to be used **with impact resistant safety goggles or glasses**. The face shield alone is NOT adequate protection against a xenon lamp explosion, nor does the face shield offer protection against ultraviolet (UV) exposure.

The gloves furnished with this unit are for keeping fingerprints off the bulb. These gloves offer no protection from lamp explosions when handling xenon bulbs.

Bulb installation, replacement, and service should only be done by **Qualified Service Personnel**, using the proper safety clothing and equipment i.e., face shield and goggles, welding jacket, and leather gloves as recommended and approved by the xenon bulb manufacturer.

CAUTION: Do NOT operate equipment with departure glass or top cover removed.



INSTALLATION OF THE XENON LAMP

NOTE: HANDLE THE XENON LAMP CAREFULLY!

OBSERVE ALL SAFETY PROCEDURES!!

1. **With the plastic lamp guard on**, install the xenon lamp by inserting the negative cathode stud marked (-) into the socket hold. An 8/32 X ¼" socket head set screw, located in the socket side, secures the lamp. Tighten it firmly.
2. Connect the R-2473-A flexible anode lead, issuing from the socket, to the positive anode stud marked (+). The brass fitting, on the lead, fits the anode end of the lamp. An allen wrench is supplied to tighten the set screw in the fitting. Do not exert any twisting motion (torsional) to lamp.
3. **Carefully** remove the plastic lamp guard. **Do not ignite the lamp with the lamp guard on.**
4. Retain the lamp guard for use whenever lamp is removed from lamphouse. **Clamp the lamp guard around the lamp before removing it from the socket.** Allow the xenon lamp to cool before clamping the guard around it.
5. Remove lamp in reverse procedure of installation.

The exhaust cools both the cathode and anode studs. While 200 degrees C is permissible on the seals of the lamp, the moving air will keep this temperature down to approximately 130 degree C, which is conducive to extremely long life. The lamp must not be operated without the ventilating fan. As explained previously, the lamp can be destroyed, in a short time, by overheating the cathode and anode seals.

R-2485-A SILICON STACKS:

Each silicon stack is mounted on a bracket which is easily accessible from the top of the power supply. To remove a stack: turn the knurled buttons to unlock the perforated top, and lift it off. Loosen the hex nuts securing the A.C. supply lead, ammeter lead connection and the stack paralleling lead. Loosen the hex nut(s) securing the stack to the bracket and remove the stack. Install new stacks in reverse order of removal.



ACCESS TO OTHER COMPONENTS IN POWER SUPPLY:

If necessary to replace the igniter, remove the perforated top and the left side panel. Disconnect the four terminals at the igniter. Remove the two nuts which secure the igniter. Lift it up over the threaded posts. The igniter panel (at rear) slips into a slot in the mount, so it must be pulled toward you, slightly, after lifting the fore part over the posts. Replace the igniter in reverse manner.

The 15,000 MFD capacitor is exposed by removing the right side panel. **To avoid shock carefully discharge this capacitor with a bleeder resistor.** Disconnect terminals. Remove the 10-24 hex nuts which secure the capacitor clamps. Lift out capacitor and clamps. Replace in reverse manner.

A 50 MFD capacitor is connected across output on top of terminal board, inside of cabinet, to facilitate ignition.

The design is such that failure of the main transformer or chokes would be a rarity. These components are accessible by removing all panels.

Replacement can be made in the field, if necessary. **Take special notice of lead positioning when removing components,** so that they are correctly re-connected.

ROTARY TOP SWITCHES:

The switch knob is secured to the shaft with a 10-32 slotted head set screw. To remove the knob, loosen the set screw and pull the knob forward off the shaft. Be certain the leads still bear markers for correct connection to new switch. Disconnect all leads from the switch. Remove the two ¼-20 round head machine screws that secure the switch to the front panel, freeing it from the panel.

Install new switch in reverse manner. **IMPORTANT:** carefully check each lead number when re-connecting the switch. Do not inter-change them. Be certain that the leads do not interfere with vertical movement of contacts. Otherwise, they will not seat properly on the common contact carrier.

DO NOT ROTATE THE TAP SWITCH WHILE THE POWER SUPPLY IS UNDER LOAD!!!

VENTILATION IN POWER SUPPLY:

The blower fan is located directly beneath the silicon stacks. Clean air is drawn through the perforated top, over the stacks and transformers exhausting out the bottom, cooling all components. The fan motor bracket is secured to the fan mounting panel by four screws.



NOTE: Blow out dust and dirt from power supply and lamphouse periodically to keep components clean and ventilation effective. OBSERVE SAFETY PRECAUTIONS WHEN WORKING AROUND OR NEAR XENON LAMP

CAUTION!!!

ALL OF OUR XENON LAMPHOUSES ARE DESIGNED WITH SUFFICIENT VENTILATION SO THAT THE TEMPERATURE AT THE XENON LAMP SEALS DOES NOT EXCEED 150 DEGREES C. LAMP MANUFACTURERS GENERALLY ALLOW A MAXIMUM SEAL OPERATING TEMPERATURE OF 230 DEGREES C. ALLOW THE LAMPHOUSE BLOWERS TO OPERATE 10 MINUTES AFTER EXTINGUISHING THE BULB. THE BLOWERS WILL DISSIPATE ACCUMULATED HEAT AND PREVENT DAMAGE AND WEAKENING OF THE XENON BULB. WE FEEL THAT THE LAMP COOLING CYCLE WILL BE MORE UNIFORM IN THIS MANNER.

OPERATING THE POWER SUPPLY WITHOUT A LAMP LOAD EXPOSES THE ELCTROLYTIC CAPACITORS (USED IN THE FILTER NETWORK) TO A HIGH OPEN CIRCUIT D.C. VOLTAGE. THUS, LEAVING THE RECTIFIER ON WITH THE LAMP TURNED OFF MAY RESULT IN FAILURE OF THE FILTER CAPACITORS.



EQUIPMENT WARRANTY



New Equipment Warranty

Sonic Equipment Company does not determine warranties on equipment, but complies with the warranty policy of the manufacturer. Should equipment be sent in for repair, Kneisley Manufacturing will determine whether the equipment is under warranty. Kneisley Manufacturing's warranty policy is as follows:

SLS-500 Shadowgraph: 1 year warranty.

Igniter: 3 year warranty.

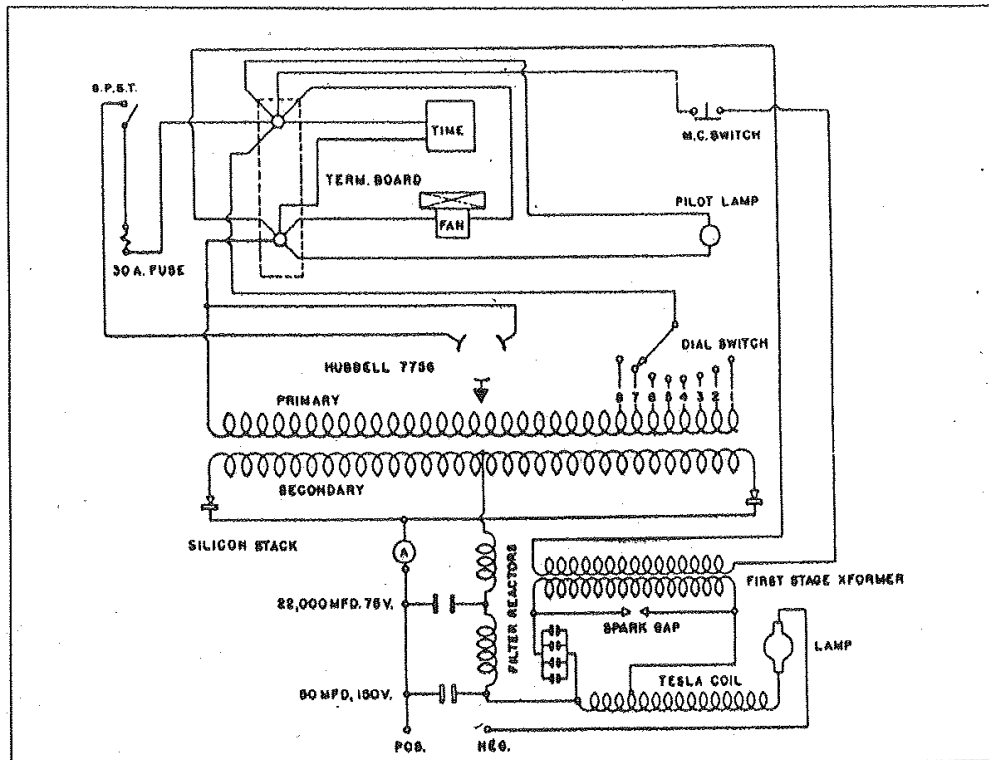
Silicon Stack (Diode Bridge): 2 year warranty.

CONTACT INFORMATION

Technical Assistance	Chuck Miller, Kneisley Manufacturing 620-365-6628 www.kneisley.com cmiller@kneisley.com
Equipment Sales and Repair	Sarah Noah, Sonic Equipment Company 800-365-5701 900 West Miller Road, Iola KS, 66749 www.sonicequipment.com sarah@sonicequipment.com
Repair Procedure	<ol style="list-style-type: none">1. Contact Sarah Noah at Sonic Equipment Company.2. Provide Serial Number.3. Obtain Return Authorization Number.4. Ship equipment to Sonic Equipment Company. Mark all paperwork and package(s) with RA number.5. Inspection performed at no charge. An estimate for repair will be issued.

GENERAL SPECIFICATIONS

R-2120-3 KNI-TRON[®] SILICON POWER SUPPLY WITH MANUAL IGNITION FOR XENON LIGHTING SYSTEM



KNI-TRON[®] Rectifier Model R-2120-3

The Kneisley Electric Company, Toledo, Ohio 43610, U.S.A.

Case - 16 Gauge Steel

Voltage Range - 105 / 125

Silicon Stack - Two R-2485

Duty - Continuous

Input Voltage - 115 A.C.

Ripple Voltage - 8%

Input Current - 17 Amps.

Efficiency - 61.5%

Frequency - 50/60 hz. Phase 1

Total Temperature Rise - 40° C.

Output Voltage - 17.0 / 20.0

Fan Cooled

Output Current - 25.0 / 30.0

Hubbell Connector Body - #7555
(Our Part Number R-2187-1)

DIMENSIONS: Power Supply: Width 23" Depth 14" Height 12", weight 87 lbs.

Lamphouse: Width 12" Depth 9" Height 15", weight 12 lbs.

Domestic Packing: Power Supply: L 12" W 12" D 23", weight 110 lbs.

Lamphouse: L 12" W 9" D 15", weight 24 lbs.

Export Packing: Power Supply: L 14" W 16" D 26", weight 112 lbs.

Lamphouse: L 16" W 11" D 14", weight 24 lbs.



R-2495 XENON LAMPHOUSE PARTS LIST

PART NUMBER	DESCRIPTION
R-2280-A	TERMINAL BOARD
R-2465-A	SOCKET
R-2470	MOTOR MOUNTING SPACER
R-2576	10-24 x 1-1/2" ROUND HEAD NYLON SCREW
R-2584	FAN BLADE, 7" ALUMINUM
R-2586	FAN MOTOR, ROTATION, C.C.W.
XM500-6/R	XENON LAMP 500 WATT (MADE FOR SONIC)
L-2676	½ x 4 x 11 GLASS
L-1902	SPACER 13/16
R-2464	ANODE LEAD

R-2120-3 SILICON POWER SUPPLY PARTS LIST

PART NUMBER	DESCRIPTION
L-0771-1	ELAPSED TIME METER
L-2307	FUSE HOLDER 3AG
R-700-3	FAN MOTOR
R-813	PUSH BUTTON SWITCH
R-1679-A	PILOT LAMP ASSEMBLY
R-1701	FUSE, ABC-30
R-1812-1	AMMETER, 0-10 D.C.
R-2930-1	SWITCH, 6 POSITION
R-2171	SWITCH, SPST, 15 AMP
R-2186	TWIST LOCK THREE WIRE BASE RECEPTACLE
R-2187	TWIST LOCK THREE WIRE CONNECTOR
R-2240-1A	IGNITER
R-2248	TERMINAL BOARD
R-2259	TERMINAL BOARD-OUTPUT
R-1903	CAPACITOR 250 VAC.DIM
R-2920	CAPACITOR, 15,000 MFD
R-2453	FAN BLADE
R-2485-A	SILICON STACK
R-1943-A	MAIN TRANSFORMER AND CHOKE ASSEMBLY
R-1672-1A	TRANSFORMER
R-2228-A	TESLA COIL
R-2273	TESLA COIL
R-2352	DIODE