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INSTRUCTION MANUAL
MODELS 8501, 8502 AND 8516
RECTIFIERS

L.P. ASSOCIATES, INC.
6650 LEXINGTON AVENUE, HOLLYWOOD, CA. 90038

Simplicity, by design.

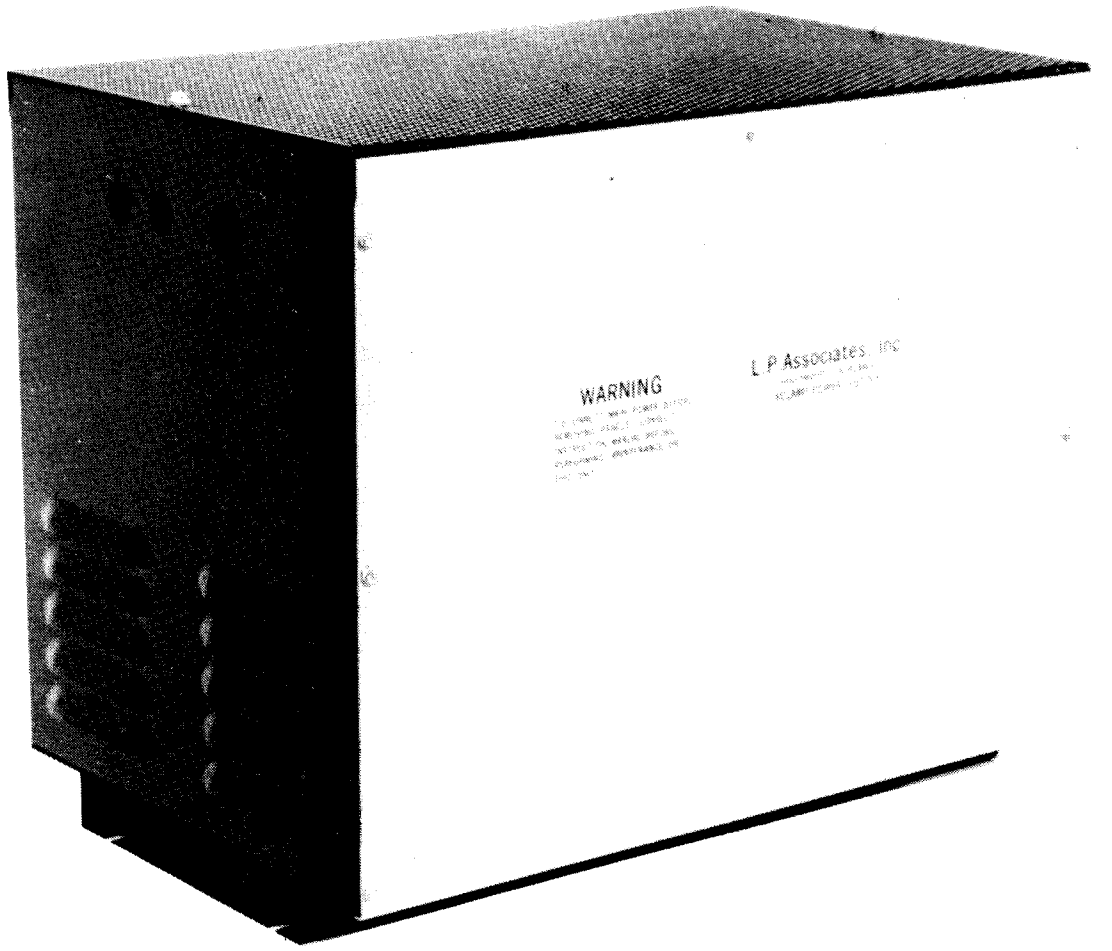

FIG. 1
Single Phase Power Supply Models 8501, 8502 and 8516

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1.0 INTRODUCTION

This manual includes information to guide you in the unpacking, installation, operation, service and maintenance of single-phase rectifiers for xenon applications manufactured by L.P. Associates, 6650 Lexington Ave., Hollywood, CA 90038.

1.1 GENERAL DESCRIPTION — MODEL 8501

OUTPUT:	Power	700-1100 watts
	Voltage	18-26 volts D.C.
	Current	30-55 amperes D.C.
INPUT:	Current	25 amperes maximum
	Voltage	117 VAC
	Phase	Single
	Frequency	60 Hz (50 Hz available)
OUTPUT:	Current Ripple	5% peak-to-peak
	Adjustment	6 Steps
SIZE:	Width	12" (30.5 cm)
	Height	15" (38 cm)
	Length	19" (48.25 cm)
WEIGHT:		85 lbs (38.6 kg)
COOLING:		Convection

1.2 GENERAL DESCRIPTION — MODEL 8516

OUTPUT:	Power	900-1600 watts
	Voltage	18-26 volts D.C.
	Current	40-70 amperes D.C.
INPUT:	Voltage	208/237 VAC
	Current	18/15 amperes maximum
	Phase	Single
	Frequency	60 Hz (50 Hz available)
OUTPUT:	Current Ripple	5% peak-to-peak
	Adjustment	9 Steps
SIZE:	Width	12" (30.5 cm)
	Height	15" (38 cm)
	Length	19" (48.25 cm)
WEIGHT:		125 lbs (56.8 kg)
COOLING:		Convection

1.3 GENERAL DESCRIPTION — MODEL 8502

OUTPUT:	Power	1400-2200 watts
	Voltage	22-30 volts D.C.
	Current	50-85 amperes D.C.
	Ripple	5% peak-to-peak
INPUT:	Current	25/22 amperes maximum
	Voltage	208/237 VAC
	Phase	Single
	Frequency	60 Hz (50 Hz available)
OUTPUT ADJUSTMENTS:		9 Steps
SIZE:	Width	12" (30.5 cm)
	Height	15" (38 cm)
	Length	19" (48.25 cm)
WEIGHT:		145 lbs (65.9 kg)
COOLING:		Convection

1.4 WARNING

When this appears in this text, it indicates a hazard to personnel.

1.5 CAUTION

When this appears in this text, it indicates a procedure which can result in equipment damage if not properly accomplished.

2.0 RECEIVING THE RECTIFIER

The units are shipped with the rectifier bolted to a shipping skid and enclosed in a heavy cardboard cover held in place by banding.

Physical damage to the container or its contents should be reported to the carrier immediately.

2.1 UNPACKING

Cut the banding strips and lift the cardboard cover off of the unit.

Remove the four bolts holding the rectifier to the skid.

Place the unit in the location selected for installation.

3.0 LOCATING THE RECTIFIER

The rectifier is convection cooled and the location selected should provide a minimum of 6" clearance around the case.

The area should have free movement of air to dissipate the heat generated by operation of the rectifier.

Provide a space large enough to allow service of the unit if required.

CAUTION

Do not allow anything to be placed upon the rectifier case; the perforated top is for ventilation and must not be obstructed.

Try to select a location as close to the lamphouse as practical. Many users install the rectifier adjacent to the projector where space is available and local codes permit.

4.0 ELECTRICAL INSTALLATION AND CONNECTION

CAUTION

Much future grief can be avoided by having a competent electrical contractor install and connect this unit.

CAUTION

We make suggestions in this manual as to minimum wire sizes to be used. Refer to, and conform to the codes applicable in your area.

CAUTION

Observe polarity of the conductors which carry the D.C. output of the rectifier to the lamphouse. Reversed polarity will immediately destroy the xenon bulb upon application of power.

WARNING

When the electrical installation is complete there are two sources of primary power within the unit. Turn off all power when adjusting or servicing the rectifier.

WARNING

This unit can run warm to very hot. Allow at least 15 minutes after turning off the power for the unit and its components to cool down before attempting any service procedures.

Holes are provided in the end section of the rectifier case for conduit entries.

Install conduit in a manner which allows some movement for service if required.

Refer to drawings in the back of this manual for connection information.

MODEL 8501 Primary line: #10 gauge minimum; 30 ampere breaker or fuse.
D.C. output: #8 gauge minimum.

MODEL 8516 Primary line: #12 gauge minimum; 20 ampere breaker or fuse.
D.C. output: #6 gauge minimum.

MODEL 8502 Primary line: #10 gauge minimum; 30 ampere breaker or fuse.
D.C. output: #4 gauge minimum.

WARNING

The rectifiers have two sources of power. Disconnect (turn off) primary power before making adjustments or service procedures.

5.0 OUTPUT POWER ADJUSTMENT — MODELS 8502 AND 8516

WARNING

The rectifiers store energy after primary power is switched off. Wait a minimum of two minutes for the capacitor charge to bleed off.

Taps are provided on TB1 to alter the output of the rectifier.

Small current changes may be made by moving the tap from H to M to L. Highest current is on H; the lowest is on L.

Larger current changes may be made by moving the tap from 4 to 5 to 6. Highest current is on 4; the lowest is on 6.

One input line must be on H, M or L. The second line must be on 4, 5 or 6.

For the 8502 and the 8516, when the primary line is high (240 VAC), tap 5 or 6 should be used. For 208 VAC use any tap, 4, 5 or 6.

When changing taps, do not insert wire into the connector so far as to clamp on the insulation rather than the bare wire.

Be sure to tighten the connector screws.

5.1 OUTPUT POWER ADJUSTMENT — MODEL 8501

Taps are provided on TB1 to alter the output of the rectifier.

The 8501 has only five contacts on TB1. Step 6 as indicated for the 8502 and the 8516 does not exist. All other adjustments are the same.

6.0 ROUTINE MAINTENANCE

WARNING

The rectifier has two sources of power. Turn off power before servicing the unit.

WARNING

This unit can run warm to very hot. Allow at least 15 minutes after turning off the power for the unit and its components to cool down before attempting any service procedures.

At 6-month intervals, clean dust out of the unit.

Inspect all electrical connections. Look for discoloration due to overheating. Be sure all connections are clean and tight.

7.0 TROUBLESHOOTING

Much data can be obtained from the volt-ammeter built into the lamphouse control panel. In addition, the following instruments will be needed to perform all trouble-shooting operations that can be done in the field:

Portable Volt-Ohm-ammeter (VOM) — must be capable of supplying current to forward bias a silicon diode on R X 1 range. (Some digital instruments cannot; consult operator's manual for instrument concerned.)

Clamp-on A.C. Ammeter capable of ¼ ampere or better resolution.

Xenon lamp power supplies have two stages of operation:

1. Before igniting the bulb — At this time, the voltage at the power supply output terminals reaches "open circuit" value (110 VDC or greater).
2. After igniting the bulb - At this time, the voltage at the power supply output is determined by the load placed on the power supply by the xenon lamp (18-30 VDC).

Power supply difficulties can be separated into one of three areas for purposes of diagnosis and repair:

A. Power Line Problems
B. Boost Circuit (Open Circuit Voltage) Problems
C. Main Power Supply Problems

A. Primary Power Problems

Power to the rectifier is supplied from the sub-panel.

The rectifier power contactor, K1, will operate when the lamphouse is switched on in the absence of primary power to K1.

If there is D.C. voltage out of the rectifier as indicated on the lamphouse voltmeter you have primary power. If there is no lamphouse voltmeter, use your VOM.

If there is no D.C. output voltage and K1 operates, check the primary line with a VOM to locate the point of failure.

B. Boost Circuit Problems (open circuit voltage)

Loss of the open circuit voltage due to boost circuit problems will result in the following:

Igniter will not fire in the AUTO mode.
Bulb will not ignite.

Disable the lamphouse igniter by removing primary power to the igniter.

Connect your VOM to the rectifier D.C. output. Observe polarity.

Turn on the rectifier.

If you read 110 VDC or more, the boost circuit is operating.
If the D.C. voltage is low, on the order of 50 volts, it is likely that diodes 5 and/or 6 have failed. Current limiting resistor R1 may be open.

C. Main Power Supply

Rectifier Bank D1-D4:

A shorted diode will cause the primary current to go high and will trip the circuit breaker in the sub-panel.

An open diode will cause the projected picture to have a pronounced flicker and may result in somewhat lower operating current.

Capacitors C1-C2-C3:

A shorted capacitor or capacitors will raise the primary current and trip the circuit breaker in the sub-panel.

C1-C2-C3:

If these are open or have lost capacity (ability to store energy) they will cause either a noticeable flicker in the projected picture or ignition problems or both.

If in doubt, disconnect the capacitors one at a time. After disconnecting a capacitor, if no change in ignition or flicker is observed, then the capacitor is having no effect. Replace it.

Low capacity or an open capacitor affect ignition because there is insufficient surge current to reliably light the bulb.

If disconnecting a capacitor does change either flicker or ignition, then the capacitor is functioning. Reconnect it.

High ripple current caused by a diode failure will result in overheating of R3.

You may use a clamp-on A.C. ammeter on the common D.C. line to the capacitor bank as an indirect method of checking ripple.

The 8501 capacitor bank will have a nominal 15 ampere (AC) current flow.

The 8516 capacitor bank will have a nominal 20 ampere (AC) current flow.

The 8502 capacitor bank will have a nominal 25 ampere (AC) current flow.

Higher current indicates a high ripple condition. Lower currents may indicate open or deteriorated capacitors.

Current into the capacitor bank varies with adjustment of the power output. As the output power is decreased, current flow of the capacitor bank will decrease.

8.0 DIODE TESTING AND REPLACEMENT

To test a diode it must be disconnected from the circuit in which it is used.

In many failure modes, the diode failure can be tentatively identified by discoloration of the bright surface because of excessive heat. You will still have to disconnect the diode and make further checks to verify failure.

After disconnecting the diode, use your VOM on the R X 1 scale. With the meter leads connected in one direction, the reading should be zero or close to it; reversing the meter leads, the indication should be a very high resistance. If the diode does not exhibit these characteristics, replace it.

If you have removed a diode from its heatsink or you are installing a new diode, observe the following instructions:

Clean the area of the heatsink in which the diode is to be installed.

WARNING

You must use heatsink compound. It is caustic in nature. Do not use your fingers; keep it away from your eyes; and do not ingest. Follow instructions on the container in which the compound is packaged.

You may obtain heatsink compound at your local electronics dealer.

Apply the compound with a wood or plastic spatula; a popsicle stick will work well. A thin layer of compound is adequate.

Use internal star washers as opposed to split washers.

When tightening the diodes in the Models 8501 and 8516 power supplies, the torque should be 25 in. lbs.

When tightening the diodes in the Model 8502 power supply, the torque should be 90 in. lbs., 125 in. lbs. max.

In replacing diodes, observe polarity:

8501 and 8516:	diodes 1-3 are 1R70HR40A types. diodes 2-4 are 1R70H40A types.
8502:	diodes 1-3 are 1N3291R types. diodes 2-4 are 1N3291S types.

9.0 IGNITION ASSIST CIRCUIT

The 8516 will always have the ignition assist circuit installed. You may find it added to the 8501 and the 8502 power supplies.

Refer to the 8516 schematic.

Relay K2 is energized by the high open circuit voltage prior to ignition.

K2, when deenergized, shorts out R3, allowing full effect of the capacitor bank.

K2, when energized, places R3 in series with the capacitor bank and limits the inrush surge current and prolongs discharge of the capacitor bank to improve bulb ignition.

Diode D7 is a zener and insures release of K2 after ignition.

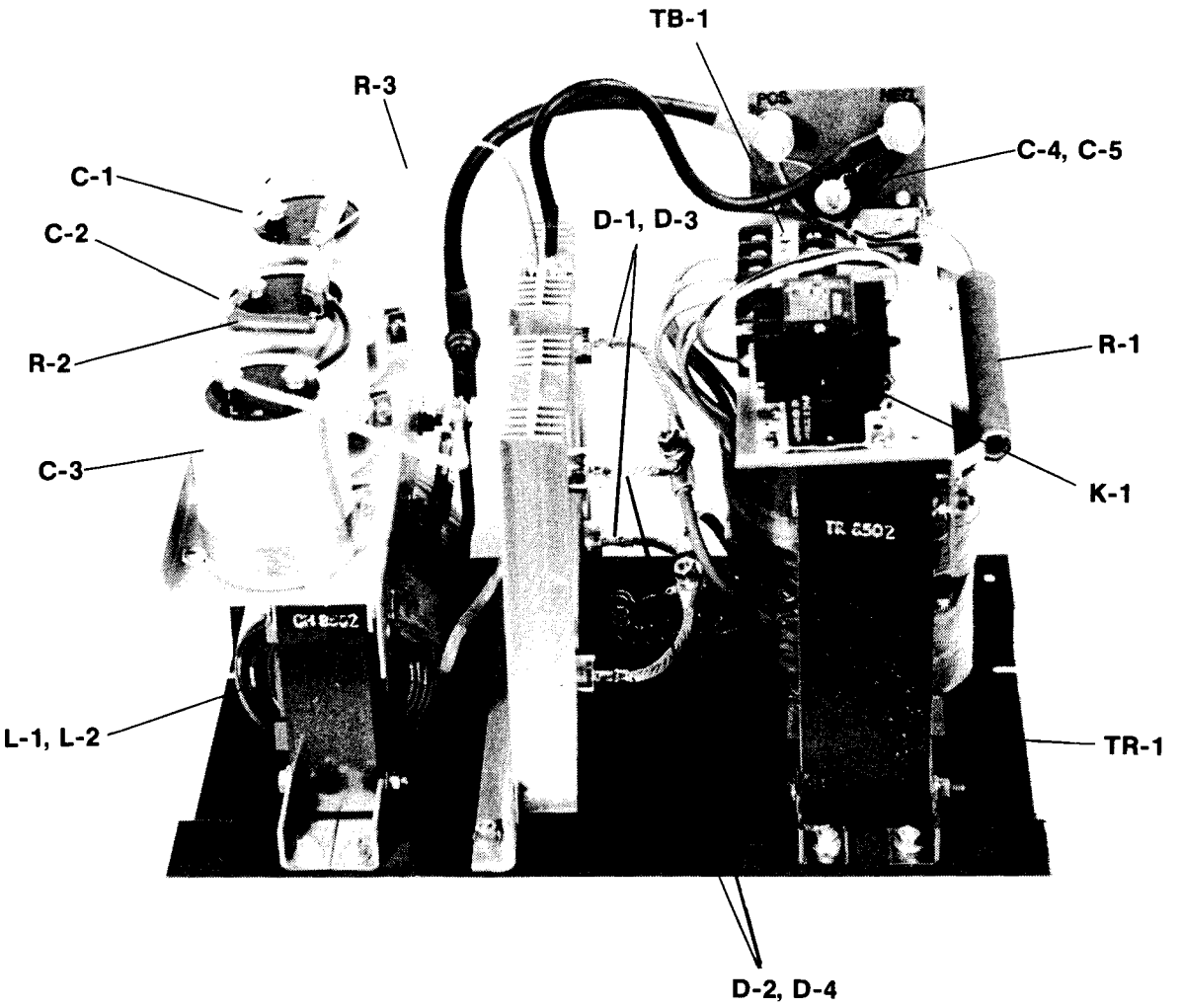


FIG. 3 Model 8502

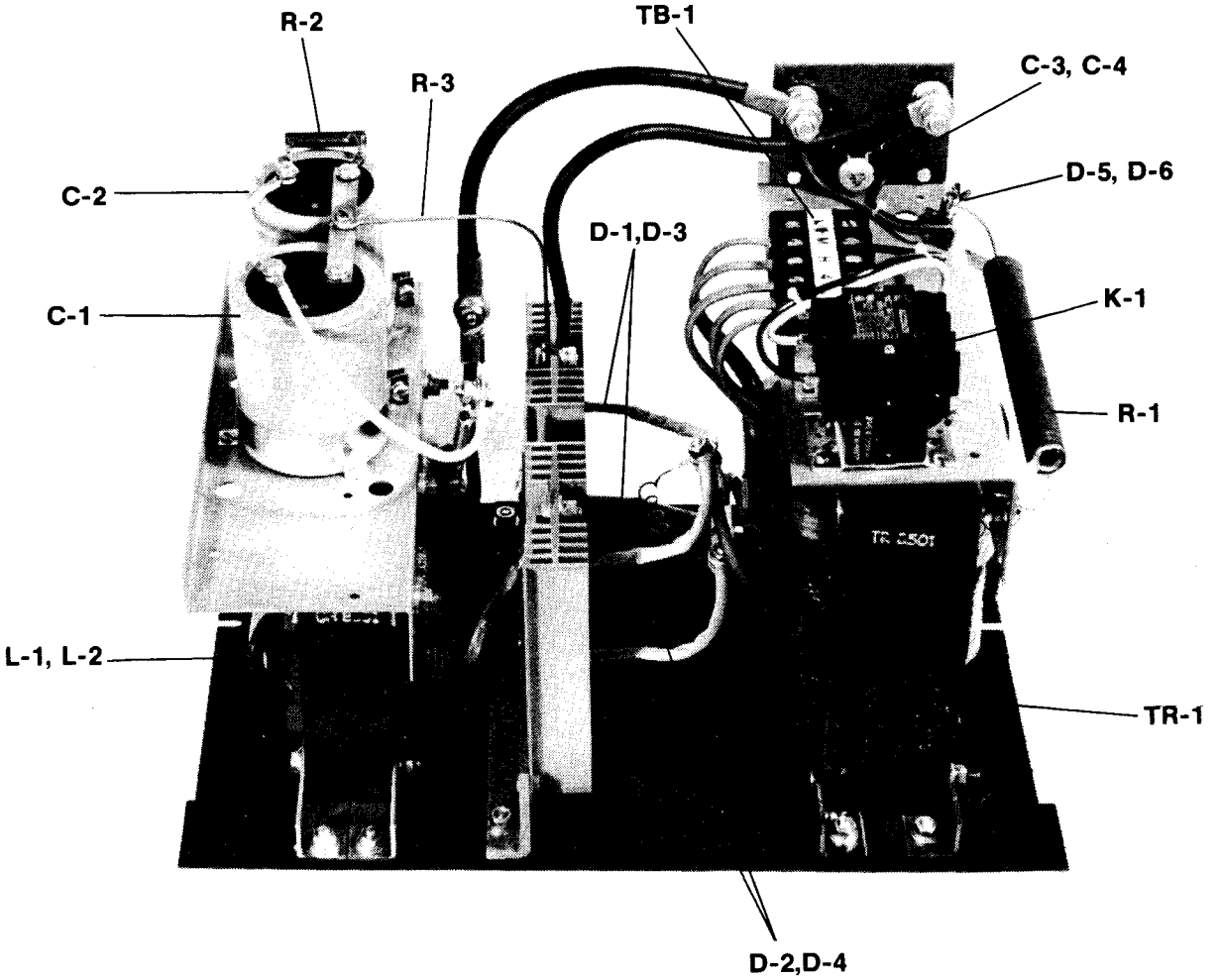
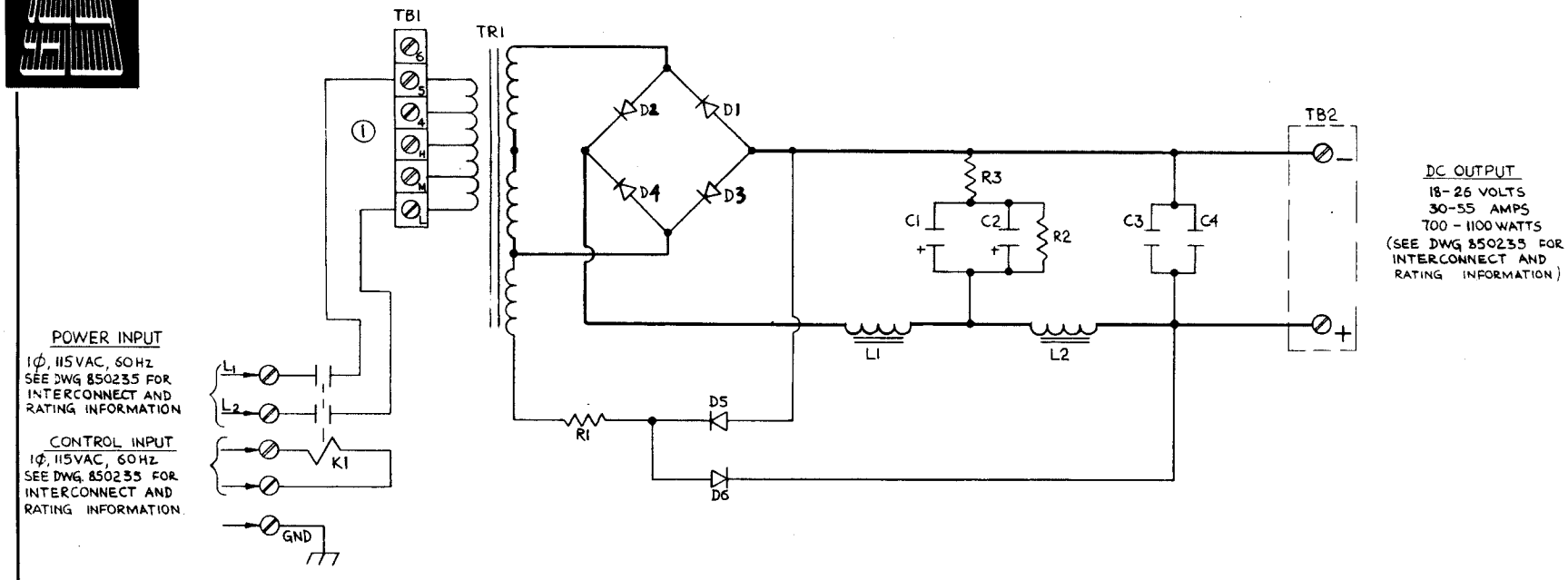
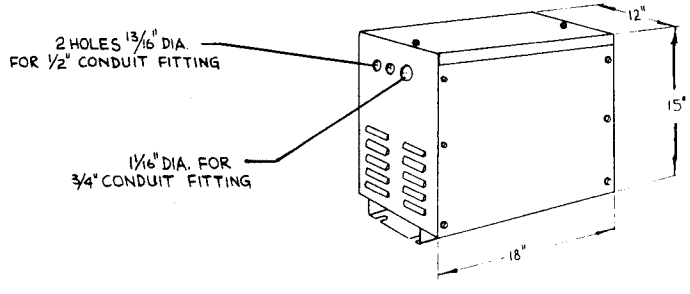


FIG. 2 Model 8501





WEIGHT: 85 LBS (38.5 KGS)

PARTS LIST

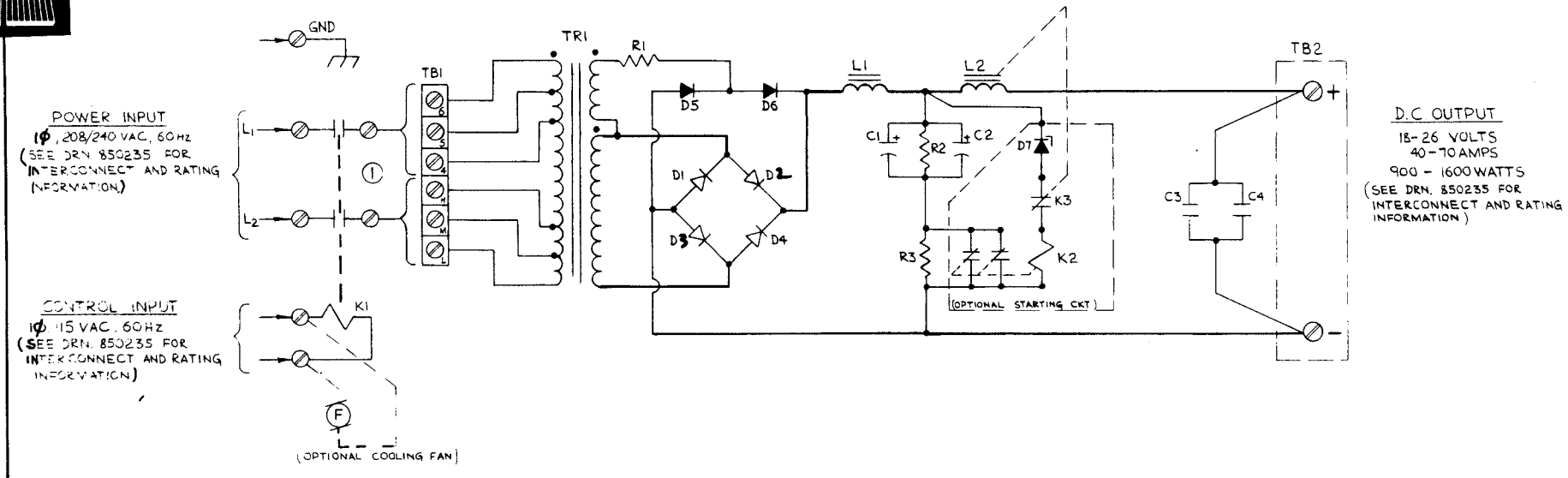
SCHEM. NO	DESCRIPTION	L.P.A. P/N	QTY
C1-2	CAPACITOR, 4900 mfd, 150 V	C101	2
C3	CAPACITOR, .005 mfd, 1 KV	C140	1
C4	CAPACITOR, .68 mfd, 200 V	C103	1
D1,3	DIODE, IR70HR40A	D103	2
D2,4	DIODE IR70H40A	D104	2
D5-6	DIODE IN4004	D100	2
K1	CONTACTOR, 2 POLE	RY103	1
L1-2	CHOKE	CH8501	2
R1	RESISTOR WIREWOUND, 85Ω, 100W	R100	1
R2	RESISTOR, WIREWOUND, 8500Ω, 10W	R101	1
R3	RESISTOR METAL STRIP, .06Ω 50W	R102	1
TR1	TRANSFORMER	TR8501	1
TB1	TERMINAL BLOCK, CURTIS H-6, INPUT	TB101	1
TB2	TERMINAL BLOCK, OUTPUT	850115	1

NOTES:

① OUTPUT CURRENT IS ADJUSTED BY CHANGING POSITION OF WIRES ON TB1 LETTERS H-L FOR SMALL INCREMENTS (H=HIGHEST, L=LOWEST) NUMBERS 4,5 FOR LARGE INCREMENTS (4=HIGHEST, 5=LOWEST)

L.P. ASSOCIATES, INC.		
SCALE:	FIG. 4	DRAWN BY EG
DATE: 6-17-83		REVISED
SCHEMATIC & PARTS LIST		
CODE IDENT 17865	L.P.A. MODEL NO. 8501	DRAWING NUMBER 850101G

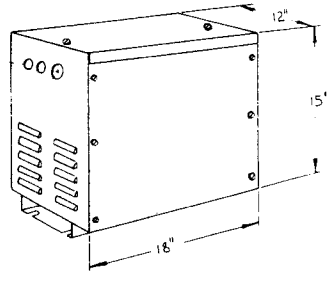
(14) 8501/8502/8516 8-85



PARTS LIST			
SCHEM NO	DESCRIPTION	L.P.A. P/N	QTY
C1-2	CAPACITOR, 4900 mfd, 150 V	C101	2
C3	CAPACITOR, .005 mfd 1KV	C1040	1
C4	CAPACITOR, .58 mfd 400 V	C103	1
D2,4	DIODE, IR70HR40A	D104	2
D1,3	DIODE, IR70HR40A	D103	2
D5-6	DIODE, IN4004	D100	2
D7	DIODE, ZENER, 39V, 5W, IN5366	D102	1
K1	CONTACTOR, 2 POLE	RY103	1
K2	RELAY, DPDT, 10AMP, KUP 11A15	RY100	1
K3	RELAY, REED, SPDT	RY102	1
L1-2	CHOKE	CH8516	2
R1	RESISTOR, WIREWOUND, 65 Ω, 100 W	R100	1
R2	RESISTOR, WIREWOUND, 8000 Ω, 10 W	R101	1
R3	RESISTOR, METAL STRIP	R109	1
TR1	TRANSFORMER	TR8516	1
TB1	TERMINAL BLOCK, CURTIS H-6, INPUT	TB101	1
TB2	TERMINAL BLOCK, OUTPUT	850115	1

2 HOLES 13/16 DIA. FOR 1/2" CONDUIT FITTING

1 1/16" DIA. FOR 3/4" CONDUIT FITTING



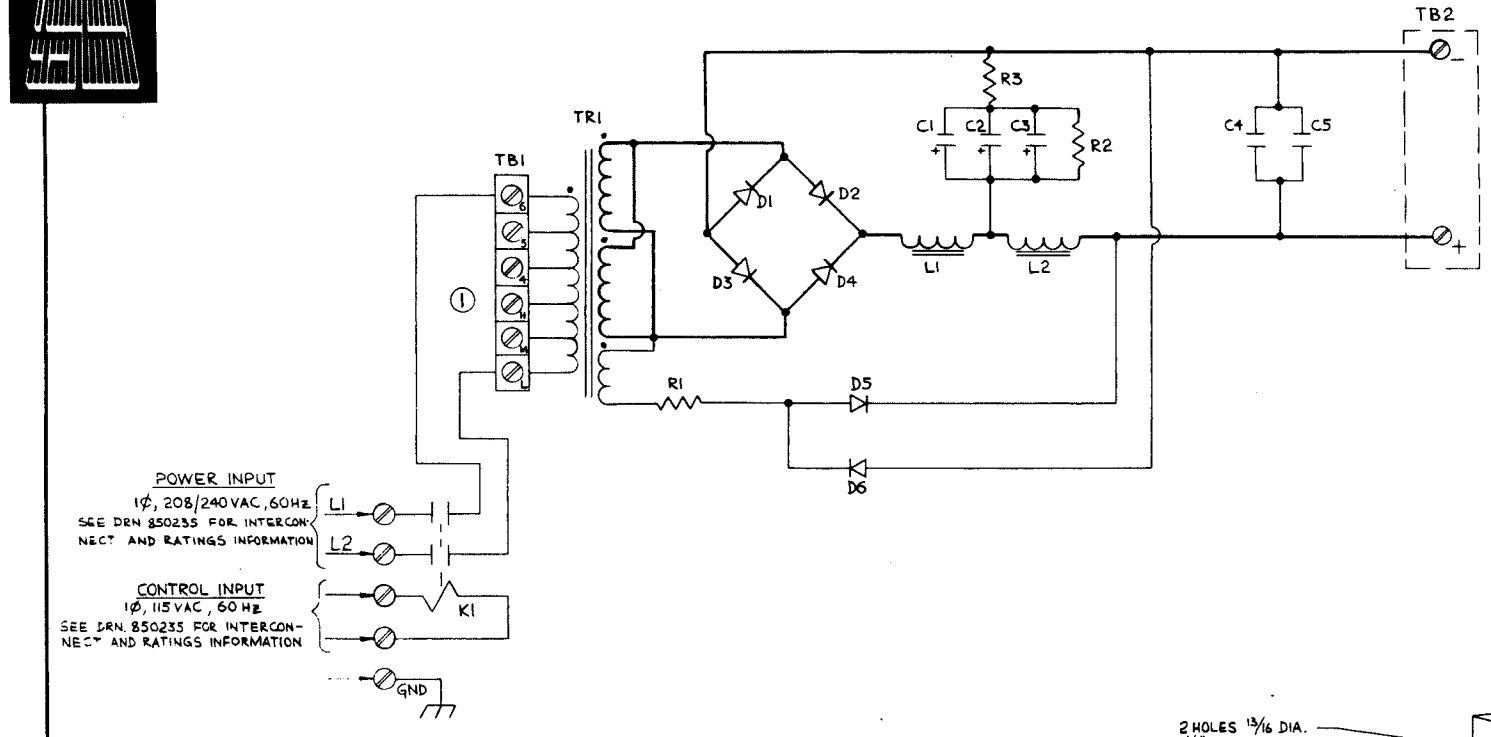
WEIGHT: 125 Lbs (56.5 KGS)

NOTES:

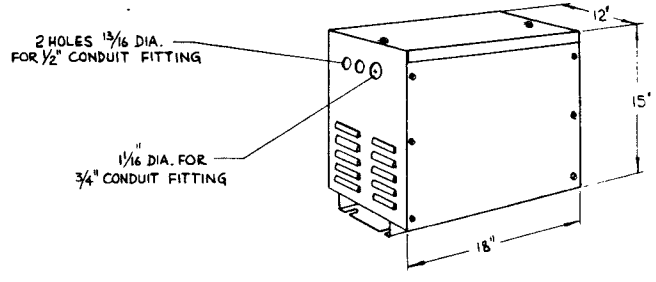
(1) OUTPUT CURRENT IS ADJUSTED BY CHANGING POSITION OF WIRES ON TB1. LETTERS H-L FOR SMALL INCREMENTS (H=HIGHEST, L=LOWEST), NUMBERS 4-6 FOR LARGE INCREMENTS (4=HIGHEST, 6=LOWEST)

L.P. ASSOCIATES, INC		
SCALE:	FIG. 5	DRAWN BY EG
DATE: 6-19-83		REVISED
SCHEMATIC & PARTS LIST		
CODE IDENT 17863	L.P.A. MODEL NO 8516	DRAWING NUMBER 851601A

(15) 8501/8502/8516 8-85



DC OUTPUT
22-30 VOLTS
50-85 AMPS
1400-2200 WATTS
(SEE DRN. 850235 FOR INTERCONNECT AND RATING INFORMATION)



WEIGHT: 145 Lbs (66 KGS)

PARTS LIST

SCHEM NO	DESCRIPTION	L.P.A. P/N	QTY
C1-3	CAPACITOR, 4900 mfd, 150 V	C101	3
C4	CAPACITOR, .005 mfd, 1 KV	C1140	1
C5	CAPACITOR, .68 mfd, 400 VDC	C103	1
D1,3	DIODE, IN3291R, 100 AMP, 400V	D111	2
D2,4	DIODE, IN3291S, 100 AMP, 400V	D112	2
D5-6	DIODE, IN4004	D100	2
K1	CONTACTOR, 2 POLE	RY103	1
L1-2	CHOKE	CH8502	2
R1	RESISTOR, WIREWOUND, 85Ω, 100 W	R100	1
R2	RESISTOR, WIREWOUND, 8500Ω, 10W	R101	1
R3	RESISTOR, METAL STRIP, .06Ω, 20W	R102	1
TR1	TRANSFORMER	TR8502A	1
TB1	TERMINAL BLOCK, CURTIS H-6, INPUT	TB101	1
TB2	TERMINAL BLOCK, OUTPUT	850115	1

NOTES:
① OUTPUT CURRENT IS ADJUSTED BY CHANGING POSITION OF WIRES ON TB1. LETTERS H-L FOR SMALL INCREMENTS (H=HIGHEST, L=LOWEST) NUMBERS 4-6 FOR LARGE INCREMENTS (4=HIGHEST, 6=LOWEST) FOR 240 VAC INPUT USE ONLY "6" OR "5". FOR 208 VAC INPUT USE ANY (NORMALLY "4" OR "5")

L. P. ASSOCIATES, INC.

SCALE:	FIG. 6	DRAWN BY EG
DATE: 6-14-83		REVISED

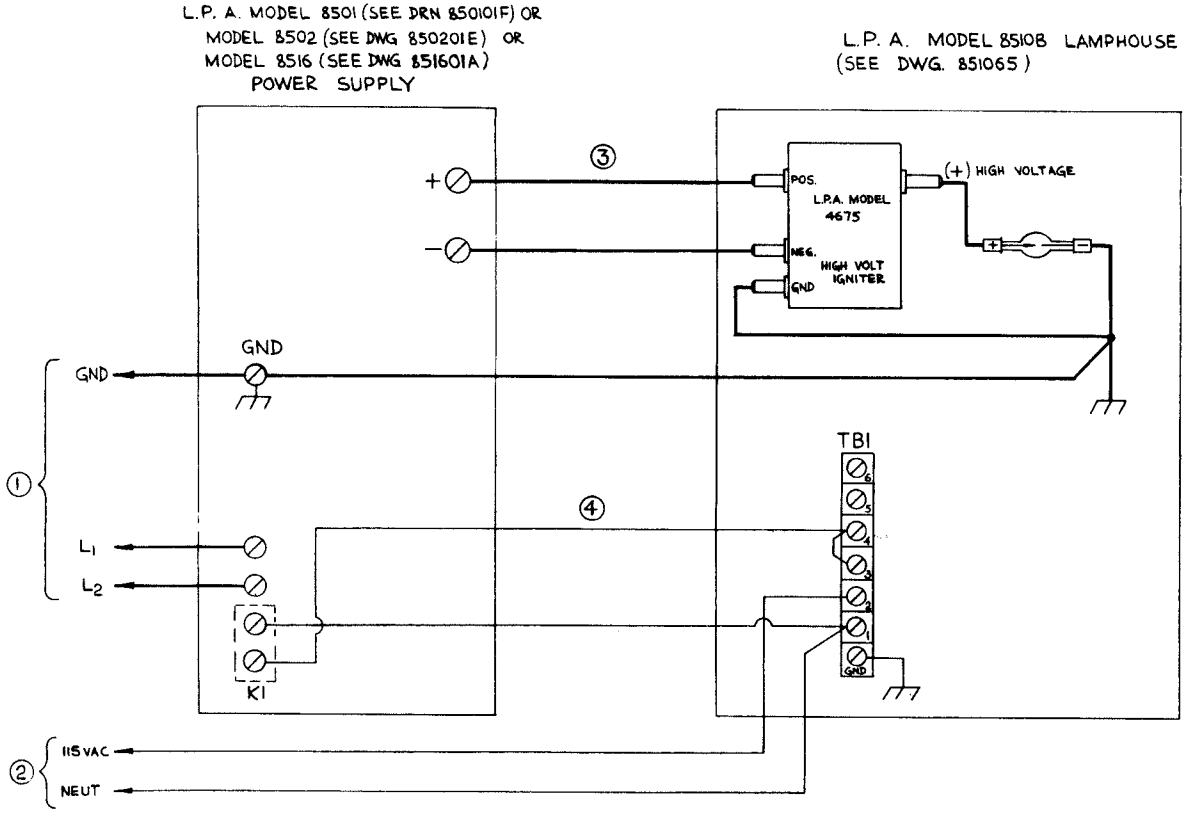
SCHEMATIC & PARTS LIST

CODE IDENT 17865	L.P.A. MODEL NO 8502	DRAWING NUMBER 850201E

(16) 8501/8502/8516 8-85

L.P. ASSOCIATES, INC.
6650 LEXINGTON AVENUE, HOLLYWOOD, CA. 90038

Simplicity, by design.



SYSTEM COMPOSITION		RATING CHART FOR 60 Hz "DOMESTIC" SYSTEM								
		8501 POWER SUPPLY 8510B LAMPHOUSE			8502 POWER SUPPLY 8510B LAMPHOUSE			8516 POWER SUPPLY 8510B LAMPHOUSE		
NOTE	DESCRIPTION	VOLT	MAX. AMPS	WIRE * AWG	VOLT	MAX. AMPS	WIRE * AWG	VOLT	MAX. AMPS	WIRE * AWG
①	1Ø MAINS POWER INPUT	115	25	10	208/240	25	10	208/240	18	12
②	1Ø CONTROL POWER INPUT	115	3	16	115	3	16	115	3	16
③	P.S TO L/H POWER WIRING	18-26VDC 150VDC(STARTING)	30-55ADC	6	22-30VDC 150VDC (STARTING)	50-85ADC	2	18-26VDC 150VDC (STARTING)	40-70ADC	2
④	P/S TO L/H CONTROL WIRING	115	3	16	115	3	16	115	3	16

* SIZE WIRES TO COMPLY WITH LOCAL CODES IN ABSENCE OF ANY GOVERNING CODE USE AWG SIZES RECOMMENDED IN CHART OR LARGER.

L. P. ASSOCIATES, INC		
SCALE:	**FIG. 7**	DRAWN BY EG
DATE: 6-15-83		REVISED
CONTROL WIRING & INTERCONNECTION DIAGRAM		
CODE IDENT 17855	1Ø- 1 TO 2 KW XENON ILLUMINATION SYSTEMS	DRAWING NUMBER 850235

17X88 PRINTED ON NO. 1000H CLEARPRINT