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PS-1120 POWER SUPPLY
OPERATION MANUAL

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WARNING!

The PS-1120 Power Supply produces lethal voltages. Ensure that input power is disconnected and storage capacitors have been discharged before beginning any inspection or internal adjustment.

WARNUNG!

Das Netzteil PS-1120 erzeugt lebensgefährliche Spannungen. Es muss deshalb darauf geachtet werden, dass der ankommende Strom ausgeschaltet ist und die Ladekondensatoren entladen sind, bevor Kontrollen oder Regelungen am Gerät unternommen werden!

ATTENTION!

L'alimentation PS-1120 fournit des tensions dangereuses. Veuillez vérifier que la prise de courant est déconnectée et les condensateurs d'accumulation sont déchargés avant d'entreprendre des inspections ou des réglages sur l'appareil.



WARNING!

The output voltage of the PS-1120 MUST be limited to match the specifications of those components to which it is connected. Exposing any system component to voltage (or any other operating condition) that exceeds its rating can result in damage to the unit and personal injury.



WARNUNG!

Die Ausgangsspannung des Netzteils PS-1120 muss der Leistung aller damit verbundenen Komponenten angepasst werden. Systemelemente Spannungen (oder anderen Betriebsbedingungen) auszusetzen, die die Leistungswerte jener Komponenten übertreffen, ist gefährlich und kann zu Schäden und Verletzungen führen.

ATTENTION!

Il faut que la tension fournie par l'alimentation PS-1120 soit limitée aux caractéristiques des composants auxquels il sera mis en contact. En exposant un composant quelconque à une tension (ou à d'autres conditions de fonctionnement), qui en dépasse la limite on pourrait endommager l'appareil ou provoquer des blessures.



WARNING!

The PS-1120 Power Supply is capable of producing 20 watts of output power. Heatsinking of metal-can flashlamps and Lite-Pacs is required when these devices are operated above 25 watts.

WARNUNG!

Das Netzteil PS-1120 erzeugt bis zu 20 Watt Ausgang. Bei Leistungen höher als 25 Watt müssen Dosenlampe sowie Triggermodul, mittels eines Kühlblechs, abgekühlt werden.

ATTENTION!

L'alimentation PS-1120 fournit jusqu' à 20 watt de puissance débitée. Quand une lampe à boite en métal et un déclenchement fonctionnent au dessus de 25 watt, il faut les refroidir au moyen d'une source froide.

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1.0 INTRODUCTION

1.1 DESCRIPTION

The **PS-1120 POWER SUPPLY** is one of a series of Power Supplies designed for high energy capacitor discharge service with any guided arc bulb-type flashlamp and Lite-Pac® including those shown below.

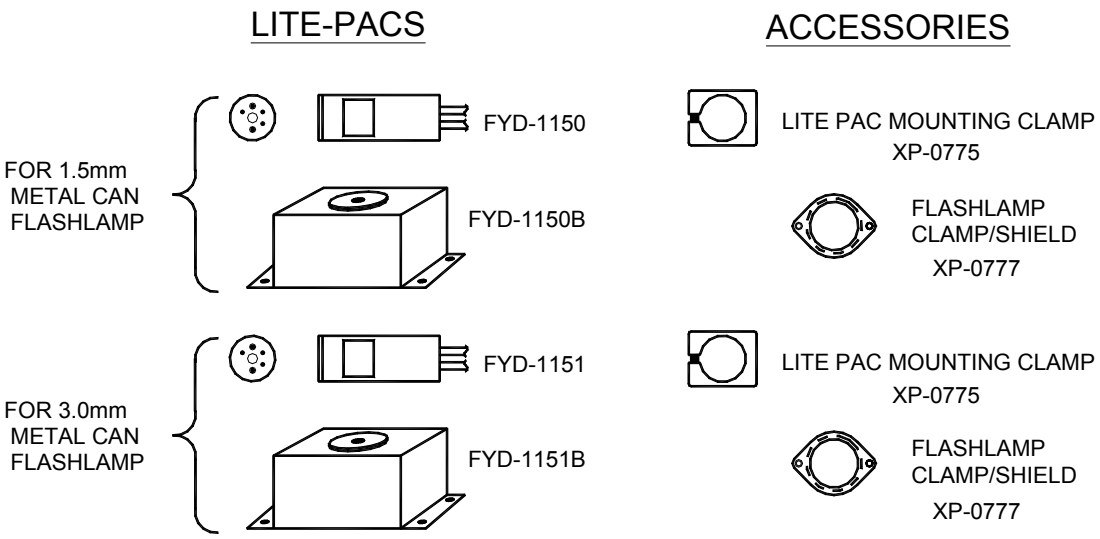


Figure 1. Optional PerkinElmer Lite-Pacs and Accessories

The PS-1120 Power Supply performs two functions: (1) charges the flashlamp discharge capacitor to a specific voltage at a specified rate, and (2) provides trigger capacitor charging and switching functions at the required flash rate. Its well regulated, low ripple characteristics ensure excellent discharge repeatability.

1.2 UNPACKING

If the condition of the outer packaging suggests mishandling has occurred, examine the unit for any signs of breakage during shipment. If there are any obvious signs of damage, contact the carrier immediately and do not proceed with the installation. It is recommended that the packaging material be retained and stored in the event that the unit has to be reshipped.

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2.0 SPECIFICATIONS

Table 1. Electrical Input

Voltage	15-28V DC
Current	Less than 1.2A DC @ 24V DC, 20W output
Trigger	Optically isolated; 20-50mA peak input; 10-20μs pulse width; leading edge trigger. Int. series resistor = 150Ω.
V_{ref} (V_0/V_{ref}=100)	4-10V DC

Table 2. Electrical Output (Discharge)

Voltage (V_o)	400-1KV DC ±2%		
Charge Rate, min.	15 J/sec (15V input, 600V output) 20 J/sec (24V input, 600V output)		
Power Output	20 watts max.		
Line Regulation	±1%		
Ripple	0.5%, with 0.1μF, 600V charge ($P\text{-}P_{max}$)		
Internal Discharge Cap	PS-1120-1 0.1μF ±10%	PS-1120-2 0.25μF ±10%	PS-1120-3 0.5μF ±10%

Table 3. Electrical Output (Trigger)

Trigger Voltage	175±15V
Trigger Capacitor	0.1μF
Max. Pulse Rate	60/J where energy per flash, J = ½ capacitance x voltage^2 (J = ½ CV^2). Do not exceed 1KHz
Recharge Delay	200μsec (typical)

Table 4. Mechanical Properties

	9 pin "D" subminiature; mating connector supplied
Output Connector	Wago Terminal Strip
Enclosure	Metal Case
Dimensions	5.85"L x 3.63"W x 1.70"H
Weight	22.5 oz. (635g)

Table 5. Environmental Specifications

Operating Temperature	+32°F to +104°F (0°C to +40°C)
Storage Temperature	-40°F to +194°F (-40°C to +90°C)

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3.0 INSTALLATION

3.1 MOUNTING

Two 6-32 UNC threaded holes in the base of the enclosure are provided for mounting the unit (see Figure 2). Mounting hardware is user-supplied.

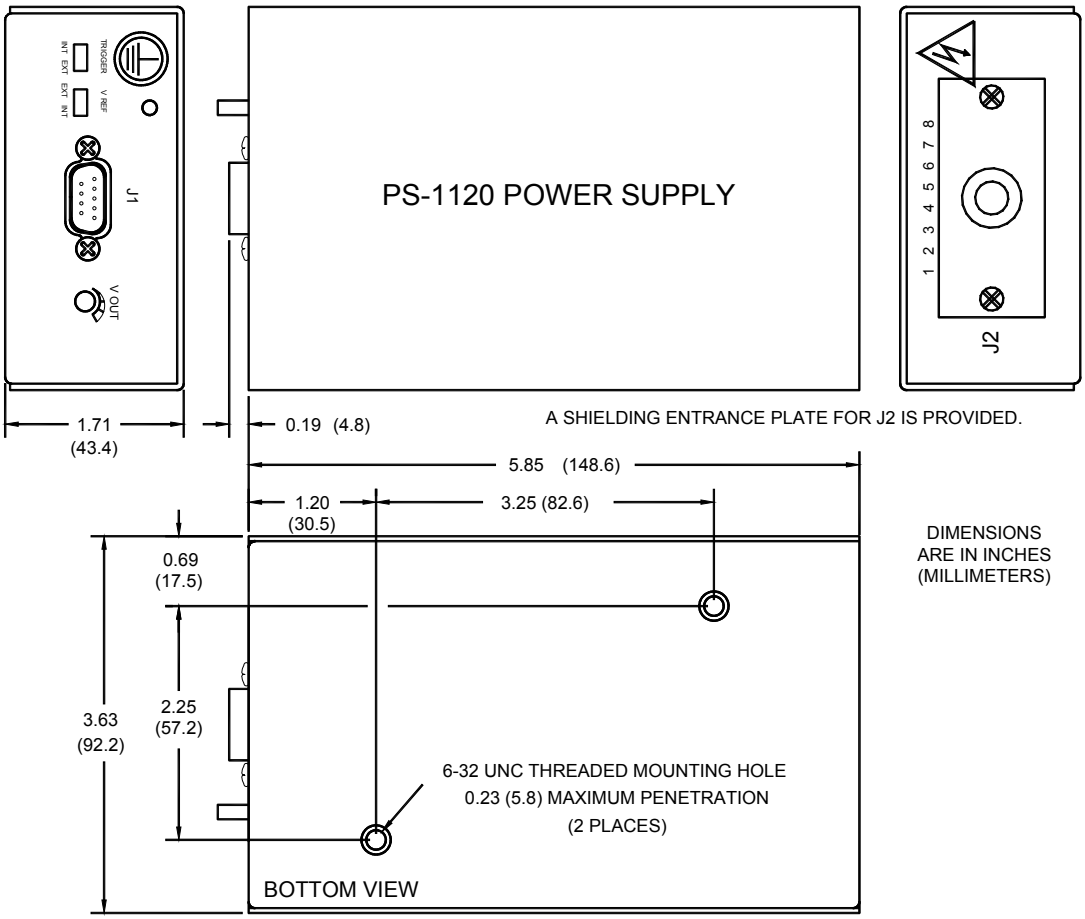


Figure 2. Outline and Mounting Dimensions

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4.0 OPERATING CONDITIONS

4.1 ENERGY RELATIONSHIPS

At 24V input, 600V output, the unit delivers a minimum of 20 joules per second to the discharge capacitor. Figure 3.1 shows typical charge rate values vs output voltage for four different DC inputs.

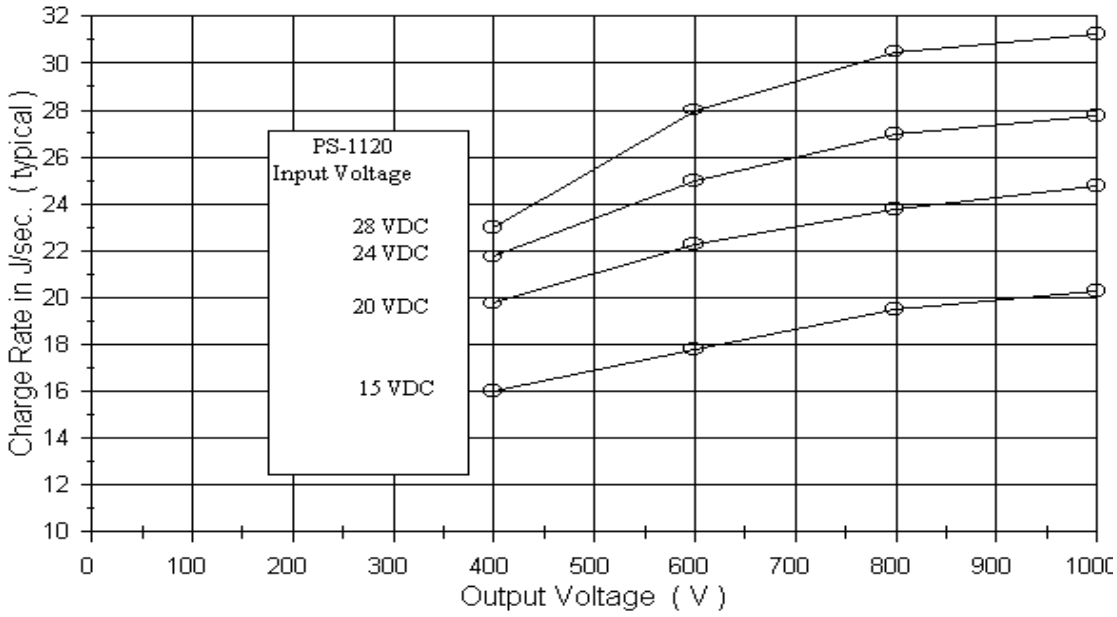


Figure 3. PS-1120 Typical Charge Rate Curves.

The energy per discharge is given by the expression:

J = Discharge energy
C = Discharge capacitance
V = Output voltage

Power is determined by P= J x Flashrate

Long-term (1 minute or more) average power must be limited to 20 watts. Therefore, the sum total of the accumulated energy discharges (Joules) divided by the operating period (seconds) must be ≤ 20 watts.

The flashtube may be fired any time after the charge time (see Fig. 4).

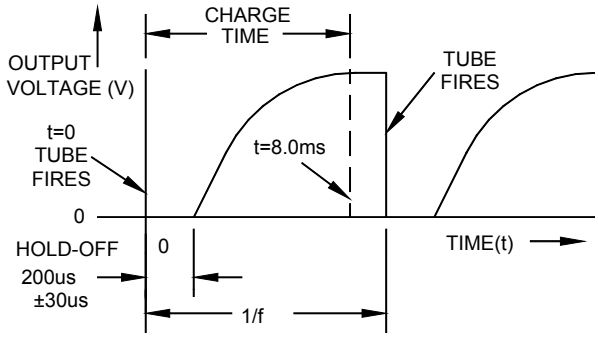


Figure 4. Output Voltage vs. Time

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5.0 OPERATION

Once operating conditions have been determined, proceed as follows:

5.1 TRIGGER REQUIREMENTS

Move the trigger switch to the EXT position (See Figure 2). Triggering is accomplished by connecting J1-5 to +5V and J1-4 to ground. Other logic voltages may be accommodated by including a series resistor. See specifications (Section 2) for additional information.

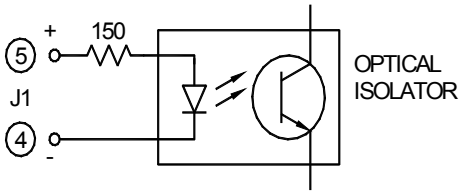


Figure 5. Input Trigger Circuit

The PS-1120 can be tested for proper Operation by moving the TRIGGER switch to the INT position. The unit should now flash at a low rate.

5.2 INTERNAL ADJUSTMENT OF HV OUTPUT REFERENCE VOLTAGE

The output voltage is programmed from 400V to 1KV by varying the V_{REF} input from 4.0 to 10.0 volts. The adjustment pot, V_{OUT}, is available through a hole in the J1 input panel (see Figure 2). The V_{REF} switch must be in the INT position, as shipped from the factory.

5.3 EXTERNAL ADJUSTMENT OF HV OUTPUT REFERENCE VOLTAGE

Move the V_{REF} switch to the EXT position (See Figure 2). Program the output voltage from 400V to 1KV by varying the V_{REF} from 4.0 to 10.0 volts.

The V_{ref} Power Supply may be programmed to zero, with the HV output (V) dropping to less than 60V. Note that the power and V_{ref} returns are connected internally.

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5.4 INTERCONNECTIONS

1. Make input connections according to Figure 7 and 9 or 10 (whichever is appropriate).
2. Make output connections according to Figure 8 and 9 or 10. When using a *standard* wiring Lite-Pac, twist together the brown and white Lite-Pac **trigger** leads and connect them to the appropriate terminals on the output panel.
3. Add external capacitor(s) and trigger diode, if required, to the Lite-Pac **discharge** circuit.
4. Turn on the power supply.
5. Set the high voltage by adjusting the reference voltage.
6. Trigger as Required

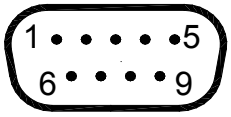


Figure 7. J1 Input Connector

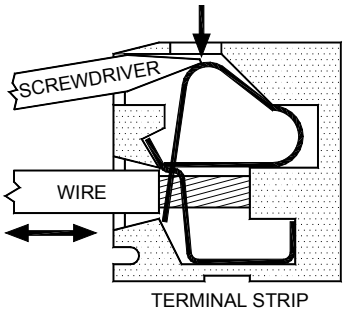


Figure 8. J2 Output Connector Cross Section

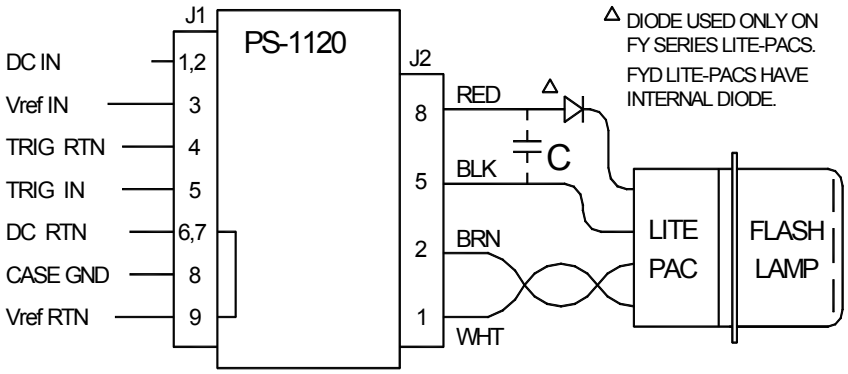


Figure 9. Typical Connections (Standard Lite-Pac Wiring)

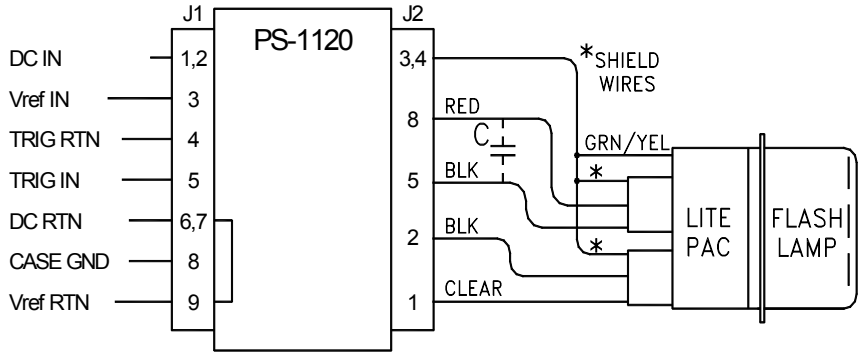


Figure 10. Typical Connections (Shielded Lite-Pac Wiring)

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WARNING!

The PS-1120 output voltage MUST be limited to match the specifications of those components to which it is connected. Exposing any system component to voltage (or any other operating condition) that exceeds its rating can result in damage to the unit and personal injury.



6.0 MAINTENANCE

6.1 REPAIRS

The PS-1120 Power Supply is, generally speaking, a trouble-free unit. No routine maintenance or repair is required.

The power supply is protected by a 7A slo-blow fuse in one leg of the DC input. If this fuse opens, do not replace it. Return the unit to the factory for repair.

In the event that the unit fails or does not function properly, it is strongly suggested that no attempt be made to troubleshoot. Field repairs or customer modifications are not authorized, and, if attempted, will void the warranty. Repairs must be made only by factory-trained personnel.

6.2 REPACKING AND STORAGE

If the PS-1120 is to be stored for a prolonged period, shipped to another location, or returned to the factory for repair, it should be repacked in the original packaging material. If the packaging material has been discarded, the unit should be packaged in a suitable container with sufficient protective material to ensure that the unit cannot move within the package and is protected from damage that could occur from improper handling.

Any storage area used for the unit should be dry, at a temperature of -40°F to +194°F (-40°C to +90°C).

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