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LS-1130 FLASHPAC

OPERATION MANUAL

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GG0261 UM0034 Rev K

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WARNING!

The LS-1130 produces lethal voltages. Ensure that input power is disconnected and storage capacitors have been discharged before beginning any inspection or internal adjustment.

WARNUNG!

Das LS-1130 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!

Le LS-1130 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 normal operation of the product involves high voltages which are potentially lethal.



Because this product is only one component of a system, and, once sold is exclusively under the control of the user, it has the potential of being used in a manner outside the intended purpose of Excelitas Technologies design.

It is essential that the operating specifications and parameters described in Excelitas Technologies literature and those accompanying other manufacturer's components be observed and not be exceeded under any conditions.

To install or operate this product in a manner for which it is not intended may cause personal injury or death, as well as severe damage to the product and/or other system components.

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1. INTRODUCTION

1.1. DESCRIPTION

The **LS-1130 FlashPac** is an integrated light system that requires only external power and control connections for operation. Its internal circuitry provides power to the discharge capacitor as well as output voltage control and triggering.

The standard fiber-optic cable adapter accepts 1.00" diameter (nominal) sub-adapters such as the MVS-14-2 or MVS-20 to accept various cable configurations (see Table 5). Please consult the factory regarding other custom options.

1.2. UNPACKING

If the condition of the outer packaging suggests mishandling has occurred, examine the LS-1130 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.

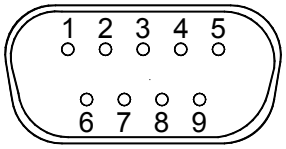
2. INSTALLATION

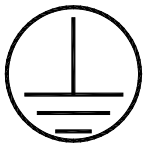
2.1. MOUNTING (SEE FIGURE 1)

Mount the unit in a protected position, without restricting air flow through its ventilation openings, by using two #6 clearance holes in the base of the enclosure. Mounting hardware is user-supplied.

2.2. SAFETY REQUIREMENTS

Use **Input Receptacle, J1** (on the right) as a disconnect device to remove any possibility of electrical input, particularly, when accessing the unit's interior. Orient the unit so that J1 is accessible.





Protect the usit by coneecting user's ground to pin 8 of **Input Receptacle, J1.**

Be careful not to touch the strobe output window, which gets very hot. The window will break if treated in a manner inappropriate for glass.



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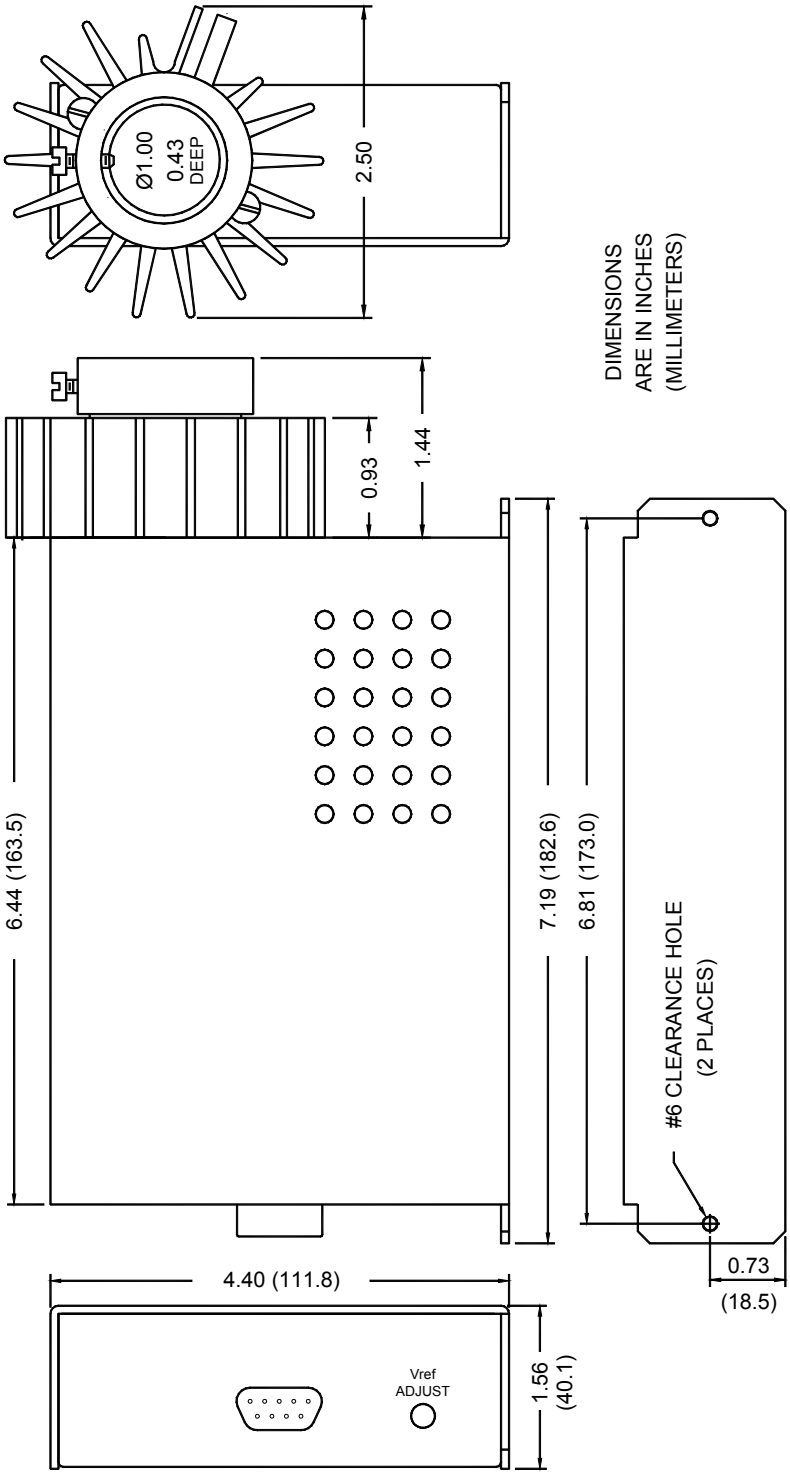


Figure 1. Outline and Mounting Dimensions

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3. SPECIFICATIONS

Table 1. Electrical Input

Voltage	15 - 28VDC
Current	Less than 1.2A DC @ 24VDC, 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 - 10VDC

Table 2. Electrical Output (Discharge)

Voltage (V_o)	400 - 1KVDC ±2%					
Charge Rate, min.	15 J/sec (15V input, 600V output) 20 J/sec (24V input, 600V output)					
Power Output	20W maximum					
Line Regulation	±1%					
Ripple	0.5%, with 0.1μF, 600V charge ($P\text{-}P_{max}$)					
Internal Discharge Cap	PS-1130-1 0.1μF ±6%	PS-1130-2 0.25μF±6%	PS-1130-3 0.5μF ±6%	PS-1130-4 1.0μF ±6%	PS-1130-6 0.6μF ±10%	PS-1130-7 0.33μF ±10%

Table 3. Electrical Output (Trigger)

SCR Voltage	175V ±15V
Trigger Capacitor	0.1μF
Max. Pulse Rate	1KHz (dependent on discharge capacitance)
Recharge Delay	200μsec (typical)

Table 4. Mechanical Properties

Input Connector	9 pin "D" subminiature; mating connector supplied
Enclosure	Metal case
Dimensions	6.44 (164) x 1.56 (40) x 4.40 (112)
Weight	22.4 oz. (635g)
Operating Temp.	0°- 50°C

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4. OPERATING CONDITIONS

4.1. POWER CONVERSION METHOD

The LS-1130 uses a high frequency inductive storage, energy release (flyback) charging system. Output voltage level control is maintained by sensing through a HV divider to a reference, difference amplifier. The difference amplifier controls the number of energy cycles released to the storage capacitor in accordance with the variable reference voltage (V_{ref}) applied to the input.

4.2. ENERGY RELEATIONSHIPS

The storage capacitor recovery or charge time is shown in Figure 2 for various DC inputs. When operating at pulse frequencies above 100Hz, add 0.2mSec (holdoff) to the charge time.

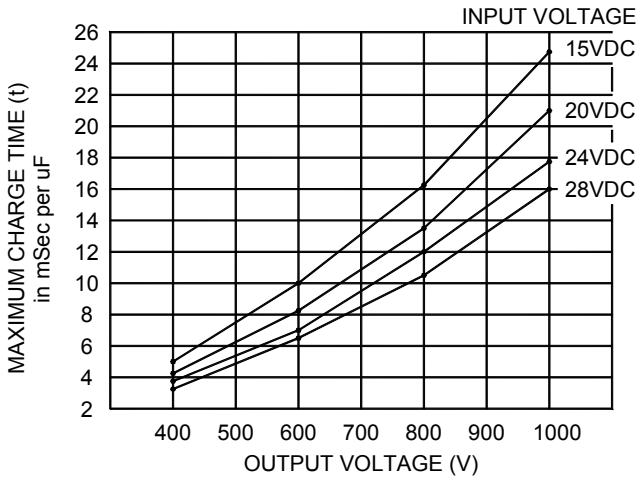


Figure 2. Charge Time Curves

The energy per discharge is given by the expression:

$J = \frac{1}{2}CV^2$, where:

C = the discharge capacitor in microfarads (μF)

V = the voltage across C in kilovolts (KV)

J = the discharge energy in joules (J)

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

The flashtube may be fired any time after charge time (t) (see Figure 3).

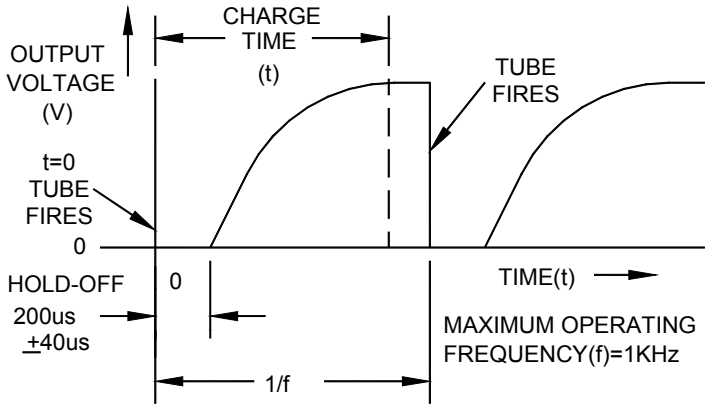


Figure 3. Output Voltage vs. Time

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5. OPERATION

Once operating conditions have been determined, proceed as follows.

5.1. TRIGGER REQUIREMENTS

Triggering is accomplished by connecting J1-5 to +5V and sinking J1-4 to ground. Other logic voltages may be accommodated by including a series resistor. See specifications (Section 3) for additional information.

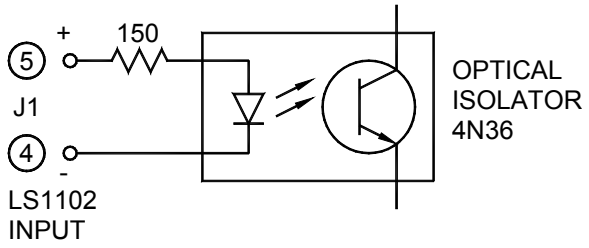


Figure 4. Input Trigger Circuit

5.2. INTERNAL ADJUSTMENT OF HV REFERENCE VOLTAGE

The output voltage level of the LS-1130 is controlled by a reference voltage (V_{ref}) which may be generated internally or applied externally. The internal/external mode is determined by the position of jumper JP1 on the unit's printed circuit module.

When the unit is configured to use the internal reference voltage, output voltage can be adjusted over its full 400-1KV range via a potentiometer (RV1) which is accessed through a hole in the input panel (see Figure 1). All units are shipped with JP1 in the INTERNAL position and adjusted for 600VDC.

5.3. EXTERNAL ADJUSTMENT OF HV REFERENCE VOLTAGE

To configure the LS-1130 for external HV adjustment:

1. Make sure the unit is off.
2. Open the cover by removing its mounting screws.
3. Move jumper JP1 to the EXT position.
4. Close the cover and replace the screws.
5. Rotate the internal voltage reference adjustment control (RV1) fully clockwise. (RV1 is available through a hole in the input panel).

The output HV is programmed from 400V to 1KV by varying the V_{ref} Power Supply from 4.0 to 10.0 volts.

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A typical external adjustment diagram is shown in Figure 5. The reference supply may be the output of a DA Converter or simply a divider network from the source power supply.

The LS-1130 internal reference adjustment control (RV1) must be set fully clockwise for full range output.

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.

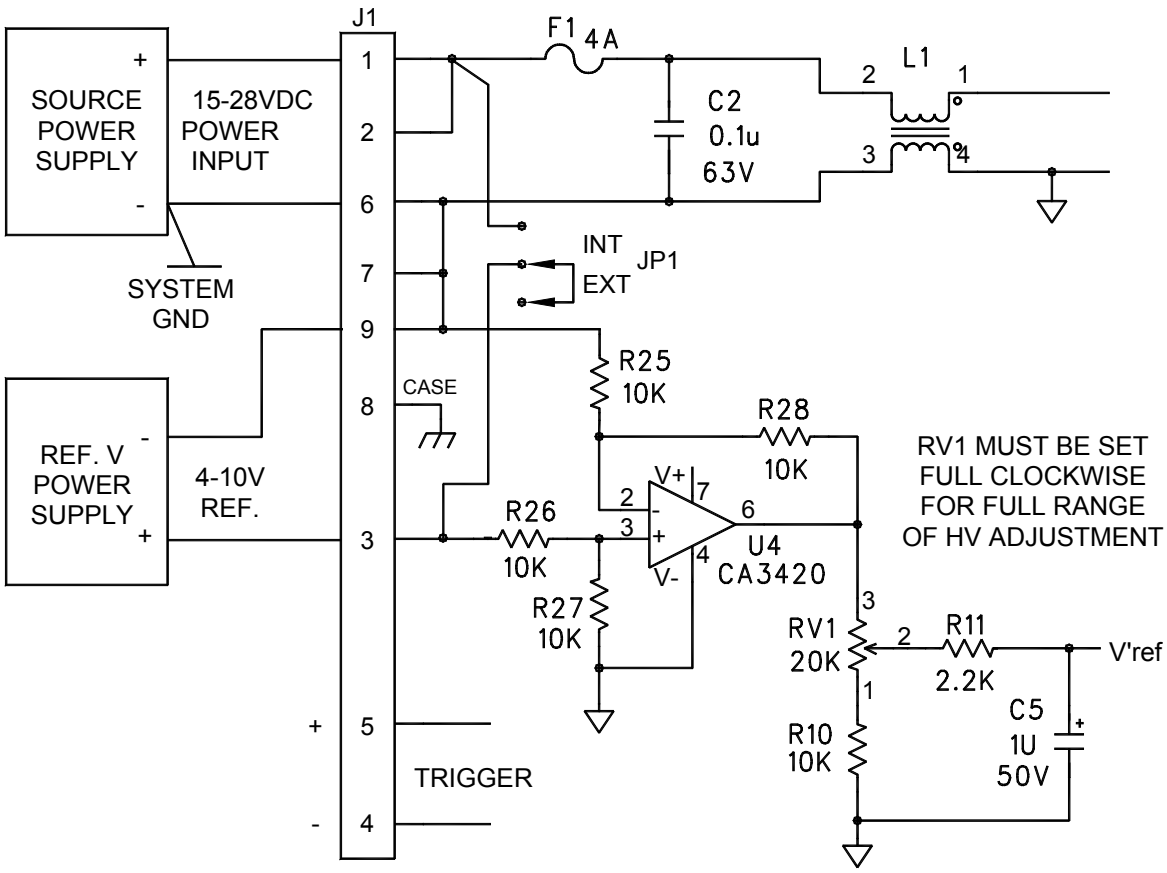


Figure 5. Connections for external HV Reference Adjustment

WARNING!

Avoid looking directly at the high intensity light flash, whether at the unit itself or at the end of a fiber-optic cable, as this can result in damage to the eyes

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5.4. OUTPUT CONNECTIONS

If a fiber-optic cable is used, connect it to the light output port with an adaptor and position the cable to distribute light to the desired area. Excelitas Technologies MVS-20 Adaptor can be used with any of the cables listed in Table 5.

Table 5. Fiber Optic Bundles (by Excelitas Technologies)*

TYPE	DESCRIPTION
MVS-7 Single	Illuminates a small area from one direction; 40 in. (102cm) long.
MVS-7D Dual	Reduces shadows by illuminating from two directions; 40 in. (102cm) long.
MVS-8 Ring Light	Illuminates an area of 2 in. with working distance of 4 in.; dependent on distance from light source and illumination plane; 36.5 in. (93cm) long.
MVS-12 Backlight	2x2 in. area; uniformity is ±5% over usable working area; 37 in. (94cm) long.
MVS-13 Backlight	4x5 in. area; uniformity is ±5% over usable working area; 37 in. (94cm) long.

* See Excelitas Technologies Data Sheet, Machine Vision Strobe, Fiber Optic Bundles

5.5. INPUT CONNECTIONS

Make input connections according to Figures 6 and 7. Use #22 AWG or heavier wire for the DC power input. A shielded pair to the trigger input is recommended.

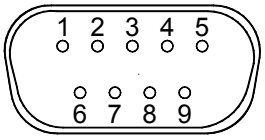


Figure 6. J1 Input Connector

The power input cable and fiber optic output cable (where applicable) should be positioned and supported to prevent strain on the LS-1130 enclosure and connectors.

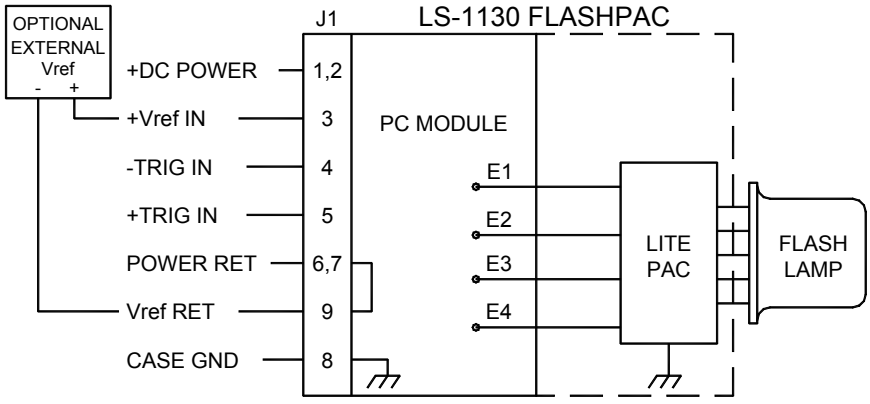


Figure 7. Typical Circuit

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6. MAINTENANCE

6.1. REPAIRS

The LS-1130 FlashPac strobe is, generally speaking, a trouble-free unit. No routine maintenance or repair is required, except for replacement of the flashlamp.

The unit is protected by a 4A slo-blow fuse. If this fuse opens, do not replace it. Return it to the factory for repair.

In the event that the unit fails or does not function properly (other than flashlamp failure), 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. Return the unit to Excelitas Technologies.

6.2. FLASHLAMP REPLACEMENT



WARNING!
The xenon flashlamp is a high-pressure, gas filled device. Wear Safety glasses when replacing it.

Over a period of time (depending on usage), the xenon flashlamp may gradually deteriorate and have to be replaced.

To replace the flashlamp, proceed as follows:

1. Ensure that input power is removed from the unit.
2. Loosen the optical connector (heatsink) adjustment screw.
3. Pull the nose piece out from under the optical connector.
4. Loosen and remove two mounting screws and remove the optical connector.
5. Grasp the defective flashlamp, pull it straight out of the Lite-Pac, and discard it.
6. Line up the leads of a new flashlamp with the corresponding holes in the Lite-Pac and push the flashlamp until it is fully seated.
7. Replace the optical connector, screws and nosepiece over the new flashlamp in reverse order to that above and tighten the hardware.

6.3. REPACKING AND STORAGE

If the LS-1130 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 put 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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