12.0 WARRANTY

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1.0 Introduction

Congratulations on your purchase of a Checkline LS Series Linear Stroboscope. The LS Series uses the principle of stroboscopic lighting to create an illusion of "stopped motion," allowing detailed inspection of objects moving at high speeds.

NOTE: When using a stroboscope, it is important to remember that while objects may appear to become motionless, they are, in fact, still moving. Exercise proper care to prevent injury.

Please read this instruction manual thoroughly before operating your stroboscope. If you have any questions not answered by this manual, call your local supplier, or visit our web chat interface at www.checkline.com for full product support.

1.1 Package Contents

LS-Series Stroboscopes are shipped fully assembled in a metal enclosure. Your package should contain the following items:

- Stroboscope
- Xenon tube, factory installed
- AC plug (110/220VAC specified during order placement)
- Connector

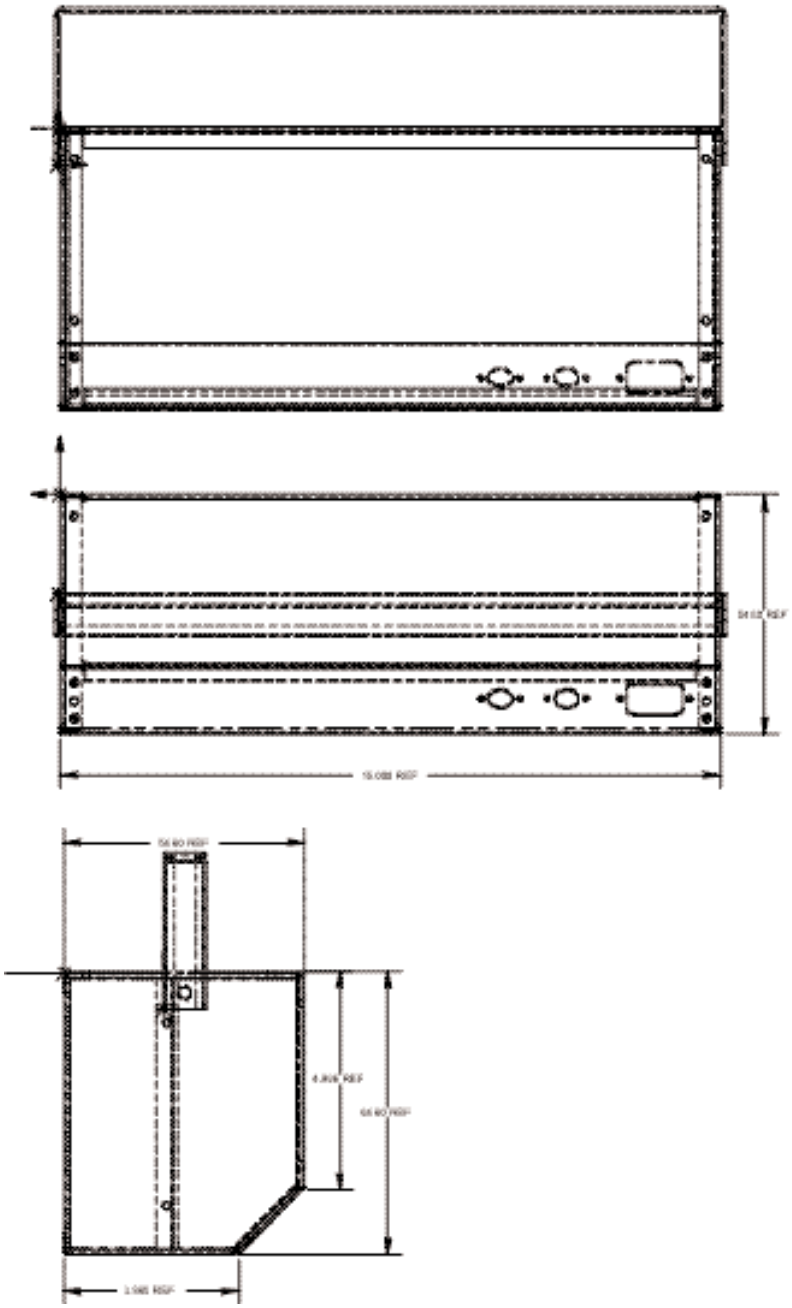
After unpacking, please examine your stroboscope for signs of mishandling during shipping. If damage has occurred, contact Electromatic before attempting to plug in the instrument. Notify your shipping carrier immediately for damage claim instructions.

2.0 Safety

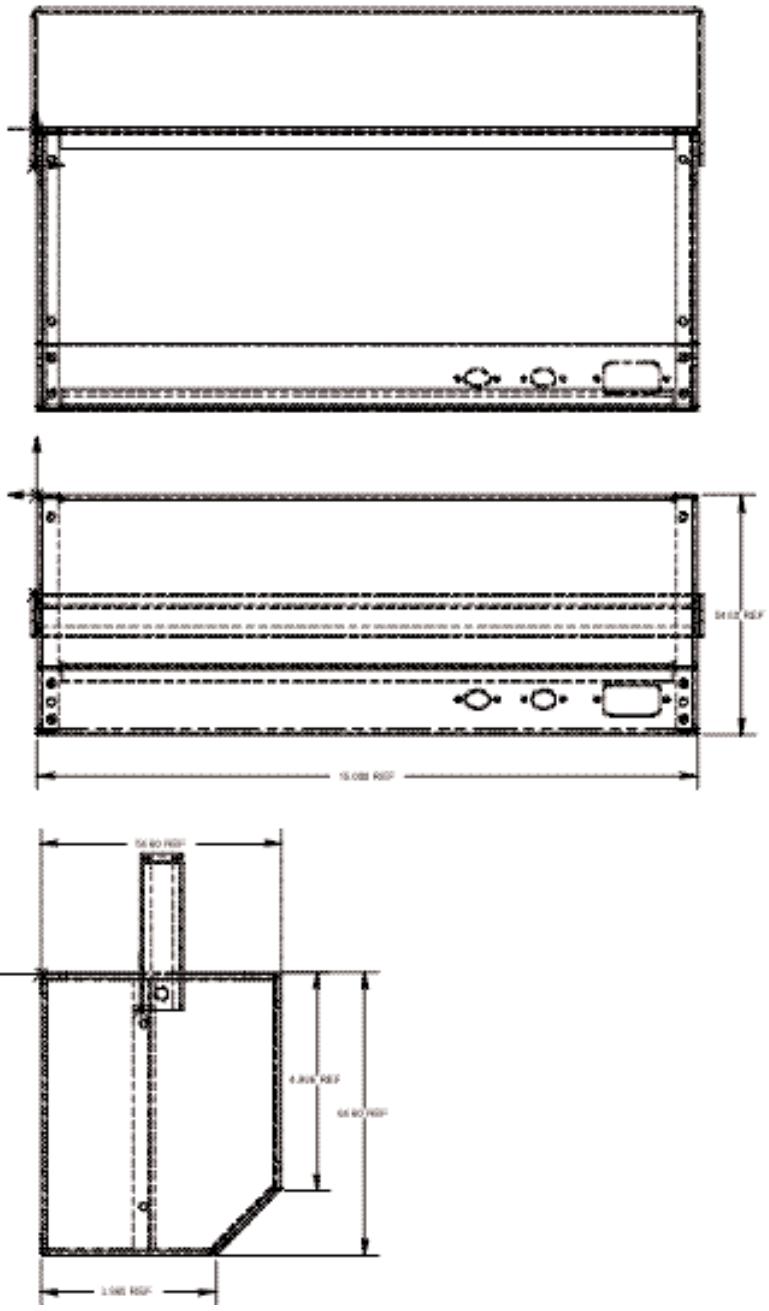
LS Series stroboscopes operate at dangerously high voltages. Disconnect the unit from the power supply and wait two minutes for the capacitor to discharge before replacing the flash tube. Any service beyond flash tube replacement is not recommended.

- Do not look directly at the emitted light; it can damage your eyes. It may also trigger seizures in people with photosensitive epilepsy.
- Xenon flash tubes are high-pressure gas filled tubes. When handling the flash tube always always wear safety glasses and protective gloves.
- Do not allow inflammable liquids and water enter the stroboscope.

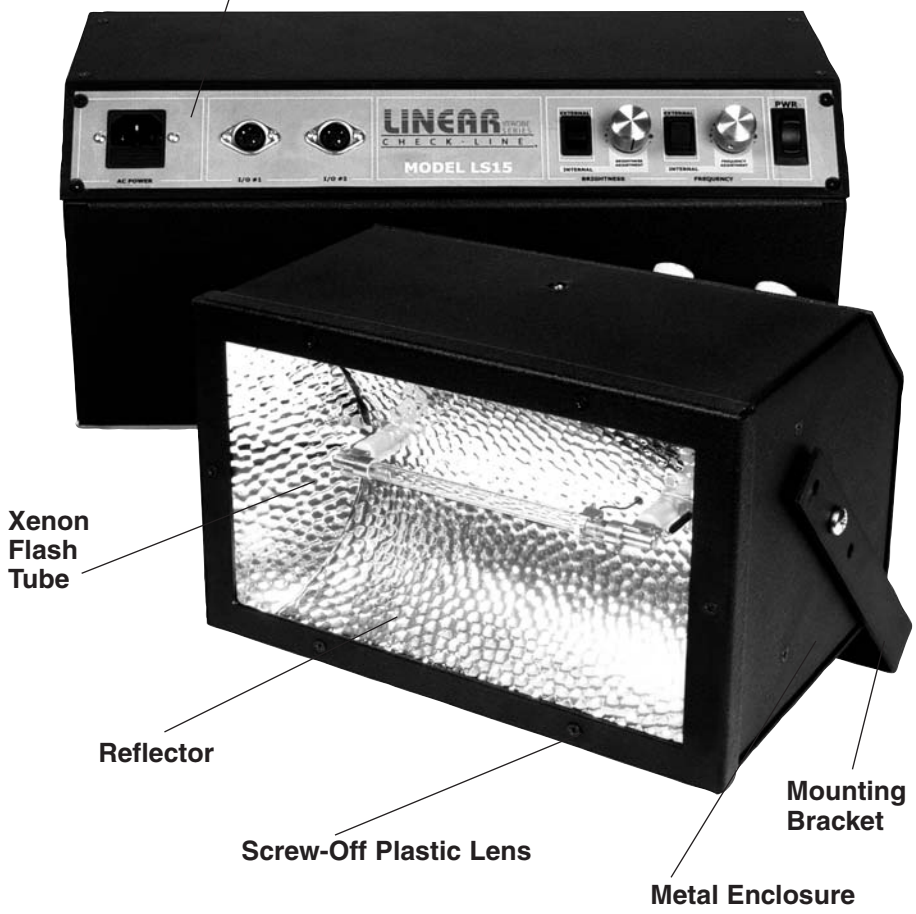
11.0 Dimension Drawings – LS-10



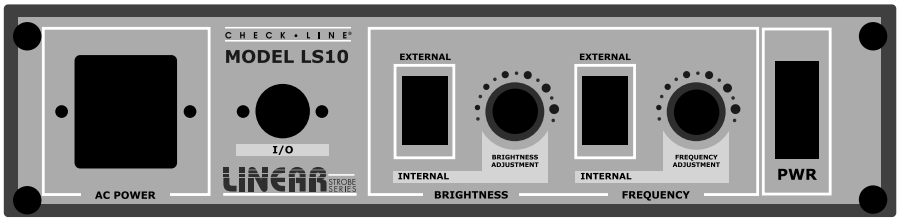
10.0 Dimension Drawings – LS-15



3.0 Overview of LS-Series Stroboscopes



4.0 Overview of LS-Series Front Panel Controls



1. **AC Power Plug:** Female connector with integrated fuse and EMI filter
2. **I/O 1:**
3. **I/O 2** *(LS-15 only)*
4. **Internal/External Brightness Control:** selects either "internal" control (brightness selected via rotary adjustment knob #5) or "external" control (brightness selected via an external voltage signal supplied into I/O #1 (Pin#4 and Pin#5)
5. **Brightness Adjustment Knob:** when selected for "internal" brightness control, rotary adjustment knob is manually set to desired position. Clockwise to increase and counter clockwise to decrease. Adjustment range is from 50% brightness to maximum brightness.

Note: When Brightness Control is set to "external", this rotary adjustment has no function.

6. **Internal/External Frequency Control:** selects either "internal" control (frequency/flash-rate selected via rotary adjustment knob #7) or "external" control (brightness selected via an external trigger signal supplied by a label sensor or similar into I/O #1 (Pin #1, Pin #2 and Pin #7).
7. **Frequency Adjustment Knob:** when selected for "internal" frequency control, rotary adjustment knob is manually set to desired position. Clockwise to increase and counter clockwise to decrease.

Note: When Brightness Control is set to "external", this rotary adjustment has no function.

8. **On/OFF Switch:** Turns the strobe on and off.

8.0 Specifications

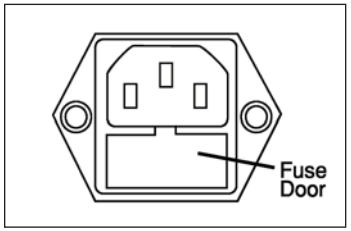
Model #:	LS-10-6000	LS-15-6000
Energy Output	0.7 joules	
Flash Duration	8–10 us	
Flash Range *(Flashes Per Minute)*	0-6000 FPM	
Illumination	Xenon Tube	
Frequency Adjustment	Variable Control	
Intensity Level	Variable Control	
Display	None	
Trigger Supply	Regulated 12 V DC 100ma	
External Trigger Input Signal	+5V at 20mA (optically isolated) NPN	
Power Requirement	115/230vac 50/60Hz (Specify prior to order)	
Power Consumption	0.5A Maximum	
Operating Temp. Range	–10 to +110 °F *(–23 to +43 °C)*	
Operating Humidity Range	0 to 90% noncondensing	
Flash Tube Life	100 Million Flashes (While maintaining 70% of initial intensity)	
Body Material	Fabricated Metal Enclosure	
Weight	**TO BE SUPPLIED**	
Dimensions	10"(L) x 6.46"(W) x 6.46"(H)	15"(L) x 6.46"(W) x 6.46"(H)
Accessories Available	Label Sensor, Extra Tube, Cables	
Operating Modes	Internal or Externally Triggered	
External Intensity Adjustment	Control Intensity 10:1, 0–6 VDC	
Extra Options	Electronics, Lamp, UV, Kelvin correction, color correction, etc.	

9.0 Replacement Parts & Accessories

Part Description:	Part #
Flash Tube	LS10-TBE or LS15-TBE
Power Cord 110 VAC	LS-CORD-110
Power Cord 220 VAC	LS-CORD-220
Fuse	LS-FUSE-6A
Daisy Chain Cable	LS-CABLE-DAISY
Male Din Connector Attachment	LS-DIN-MALE
Sensor (printing, label inspection, etc.)	LS-GAPSENSOR
Connector	Digikey: 275-1011-ND Singatron: YE-1338A

7.2 Fuse Removal

1. Disconnect power cord from stroboscope.
2. Wait 2 minutes to give the capacitors time to discharge.
3. Take a small flat-head screwdriver and open fuse door shown in the figure at right
4. Gently pull fuse out of fuse holder with small screwdriver.
5. Check continuity across fuse to check if fuse is good or bad.
6. If continuity is present across fuse, put back into fuse holder and proceed with other troubleshooting steps.
7. If continuity is not present contact the manufacturer or distributor before replacement! The fuse will only blow when something is wrong and this condition should be carefully evaluated with factory before replacing fuse.



7.2 Trouble Shooting

You can expect years of trouble free performance from your stroboscope. However, if you experience problems, check the following:

1. Stroboscope is on, but no light is emitting from your bulb.

a. Check your Flash Tube. Cracks, cloudy or dark spots at the ends of the tube, or a broken or burnt trigger wire—all indicate that the lamp is faulty and should be replaced with a Checkline approved bulb.

b. Make correct Mode switch is selected.

c. Make sure the trigger clip is properly connected and not touching the cathode and that it is properly centered over the wire band on the flash tube.

2. Stroboscope will not work with external input

a. Check your Flash Tube and replace if necessary with a Checkline approved bulb.

b. Make sure that the Frequency switch is set to External.

c. Check that wiring of input signal is correct.

5.0 Installation

1. Mount strobe in desired location using the mounting brackets provided.
2. Insert the molded plastic power cord into the power receptacle—#1 on the control panel drawing shown on page 4. Make sure that the plug is fully inserted and firmly seated.

6.0 Operation

LS Series Stroboscopes allow visual inspection of moving objects. The flash rate can be controlled by an external signal or internally using the strobe's adjustment knobs.

NOTE: Flash duration and intensity affect the clarity of the "stopped" image. Shorter flash durations produce sharper images. It is recommended that flash intensity (brightness) be approximately four times brighter than the ambient lighting.

6.1 Using the External Mode (synchronous)

In the External Mode, the strobe will flash synchronously with each triggering signal sent by an external sensor or signal generator connected to the unit via the I/O port. Different types of sensors can be combined with the LS stroboscope, including photoelectric, magnetic, inductive and NPN signals.

1. Move the FREQUENCY Control Switch to EXTERNAL.

   Note: The FREQUENCY CONTROL KNOB is now disabled.

2. Connect the external triggering device to I/O #1 or I/O #2.

Pinout detail of female DIN receptacle in strobe.

I/O #1 Pinout	**I/O #2 Pinout** ***(LS-15 only)***
Pin 1: Trigger + (external sensor)	Pin 1: Trigger Out
Pin 2: Trigger – (internal sensor)	Pin 2: GND
Pin 3:	Pin 3: Internal Trigger Out
Pin 4: External Brightness +	Pin 4:
Pin 5: External Brightness –	Pin 5:
Pin 6: *Slave trigger LS-10 only*	Pin 6:
Pin 7: 12 VDC (Sensor Power)	Pin 7:

3. Move the PWR Switch to ON. The strobe should begin flashing in response to each signal sent by the triggering device.
4. Turn the BRIGHTNESS ADJUSTMENT Knob to increase or decrease the intensity (brightness) of the flash for optimum viewing.

Note: If the external trigger rate exceeds the LS Series maximum flash rate (6,000 FPM), missed flashes will occur.

6.2 Using the Internal Mode (non-synchronous)

In the Internal mode, the operator can control the number of flashes per minute and their intensity using the Frequency and Brightness Adjustment Knobs.

1. Switch the FREQUENCY and BRIGHTNESS Control Switches to INTERNAL.
2. Move the PWR Switch to ON.
3. Adjust the flash rate by turning the FREQUENCY ADJUSTMENT knob until the motion of the object being inspected appears to stop. Experience has shown that flash rates at or near 4200 FPM (70 FPS) generally produce good results.
4. Turn the BRIGHTNESS ADJUSTMENT Knob to increase or decrease the intensity (brightness) of the flash for optimum viewing.

7.0 Maintenance & Repair

Return the stroboscope to the factory for service if it should fail or not function properly. No field repairs and customer modifications are authorized by the manufacturer. Factory trained personnel must perform all repair work.

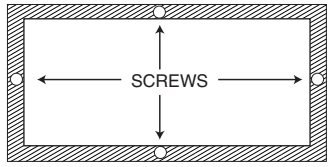
WARNING: Always make sure the AC power is disconnected before making any minor adjustments or replacing the flash tube.

WARNING: The flash tube gets very hot, very quickly. Allow amply cooling time before removal

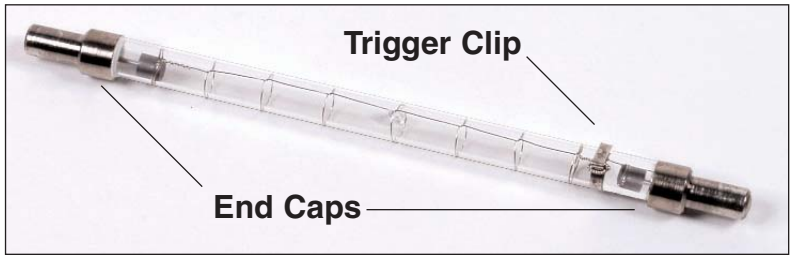
7.1 Flash Tube Replacement:

Before failing completely, the flash tube will show reduced light output, skipped flashes and other inconsistencies. At this point the flash tube should be replaced using the following procedure:

1. Disconnect power supply from stroboscope. Wait two minutes to allow the energy to discharge across the capacitor, and, if necessary, for the flash tube to cool.
3. Remove the screws on the acrylic lens with a small Phillips head screwdriver.



4. Carefully disconnect trigger clip, then pull up on flash tube to release from connectors.



5. Reinstall the new flash tube, making sure proper polarity is used. The flash tube will have a red tip for anode and a black tip for cathode. This will match the color coding of the wires connected to the retaining clips. When installing, handle the bulb by the end caps to prevent contamination. Remember to reconnect trigger clip to ring on cathode side of flash tube after new tube is reinstalled.

   Note: Be sure to wear clean gloves or use a clean cloth to protect the bulb from contaminates and oil from hands.

CHECK·LINE®
INSTRUMENTS

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LINEAR Series Stroboscopes

Operating Instructions