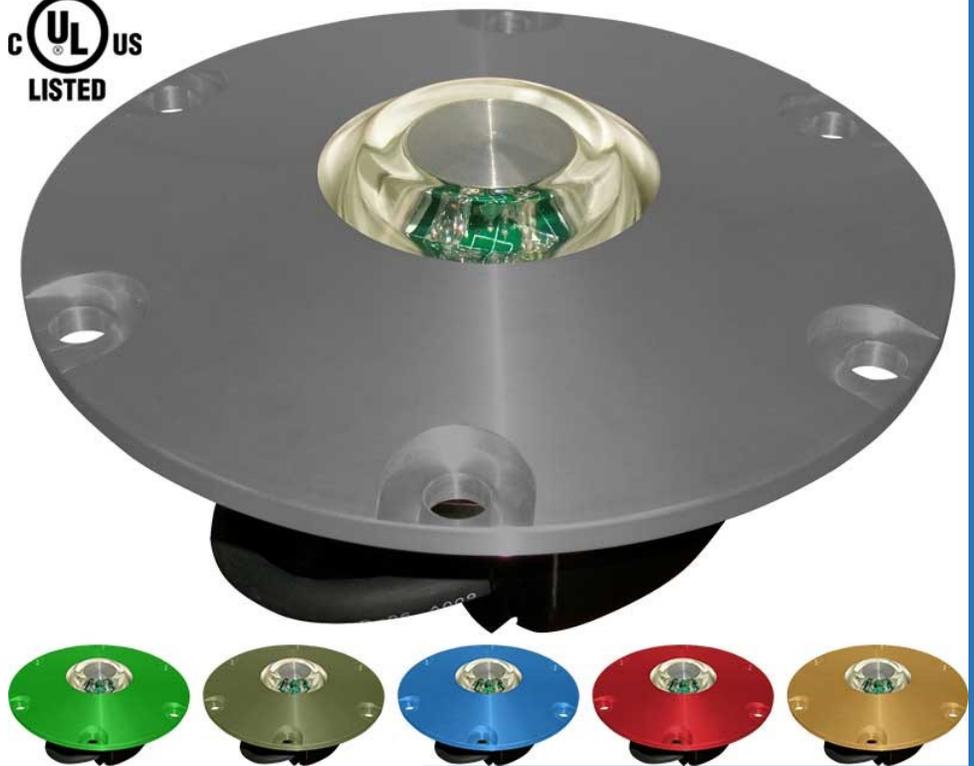




Installation Manual 392 UL



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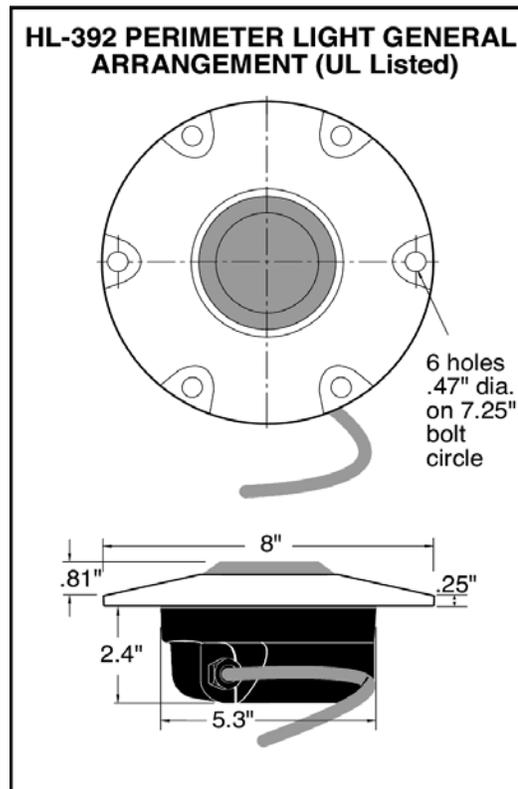


Your Flight Light HL392 light fixtures have been designed to provide you years of service if you follow the recommendations outlined in this guide. Flight Light recommends any installation of our heliport or helideck fixtures to follow NEC (National Electrical Code) 2014 and any other applicable local electrical codes.

Our fixture is compliant with:

- UL 1598 Standard
- FAA AC 150/5390-2B Heliport Design Guide
- Exceeds FAA Engineering Brief 87 Specifications
- ICAO Annex 14, Volume II for TLOF
- Transport Canada TP14371, AGA 7.16
- US Army Aviation Lighting Manual TM 5-811-5, Figure 5-3
- Buy American Act

Our newest feature: **Night Vision Compatibility**, allows pilots to see the lights while wearing Night Vision Goggles due to the IR (infrared) LED. The light is compatible with all generation goggles.





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1. Introduction

The Flight Light model 392 is an anodized aluminum light suitable for helipad applications in order to ensure proper visual guidance. Available in VDC and VAC, the light conforms to the FAA requirements and ICAO TLOF.

For pavement applications, the helideck inset lights should always be installed using the Flight Light 8" OD base can and following the below instructions as well as the local NEC codes.

The Base Can must be purchased separately.

This manual contains the needed instructions to complete a successful installation. Failure to install the system properly will negatively impact the performance of the system, shorten its life and may void the manufacturer's warranty.

The proper installation and operation of your system is our top priority. For that reason this installation manual has been designed to guide you through each of the major steps of the in-pavement and electrical installation of the system. We recommend that a copy of the manual be given to both the design engineer and the installer of your system, well in advance of the actual installation.

The major steps covered in this manual include:

In-pavement Installation

1. Proper Placement of Fixtures
2. Drainage System Requirements and Design
3. Base Can Installation guidelines

The installation and maintenance should be done by authorized personnel only.

For questions or guidance during the installation process, please contact our office as engineers and technician are always available to help you.

Phone number: 1-800-806-3458
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OR sent an email to: sales@flightlight.com



2. Safety Measures

You must know whether your heliport lighting system is powered by AC or DC before installing the fixture. AC models work on either 120VAC or 240VAC if Halogen or on a range of 100 to 240VAC if LED. DC models operate from 10 to 30VDC. The lights are designed to be installed in a parallel circuit, which maintains a constant voltage and brightness for all lights.

Ensure power is off before installing or servicing heliport fixtures!

Follow the local NEC code!

Make sure the equipment is rated and approved for the environment in which you are intending to use it. Do not operate this equipment in humid, flammable, or explosive environments unless it has been rated for safe operation in these environments.

Use only electrical wire of sufficient gauge and insulation to handle the rated current and voltage demand.

Route electrical wiring along a protected path. Make sure they will not be damaged by moving equipment.

Protect components from harsh environment conditions.

Protect equipment with safety devices as specified by applicable safety regulations.

Before starting this equipment, check all safety interlocks, fire –detection systems, and protective devices such as panels and covers. Make sure all devices are fully functional. Do not operate the system if these devices are not working properly.

Never operate equipment with a known malfunction.

Do not attempt to operate or service electrical equipment if standing water is present.

Do not touch exposed electrical connections on equipment while the power is ON!

Wiring and electrical design should be authorized by an electrical contractor.



3. Concrete Installation Procedures

3.1 Unpacking

Each inset light is packed in its own box 9"x 9" x 5". Carefully remove the light from its box and inspect for damages. If any damages are found, file a claim with the carrier.

3.2 Drainage System Requirements

The truism that water and electricity don't mix holds for Aviation Installations. Helipads pavement is subject to many sources of moisture, the most serious of which is ground water. The Flight Light lighting system is designed to prevent water and water vapor from making contact with electrical conductors, contacts and connections. Fixtures used in the FL system employ seals that prevent moisture from entering the light fixture. Fixtures are IP68 rated. However, water within the base cans, left for long periods of time, may create problems. Standing water in the base can is especially undesirable in colder climates because of damage that can be done when water freezes and expands. To prevent problems caused by standing water in the base cans a proper drainage system must be designed and prior to the electrical installation of the fixtures and pouring of concrete. Failure to install a proper drainage system may result in damage to the system components.

3.3 Base Can Installation

There is no standard way to build a helipad. Each project includes its own individual variables. Some of these are:

- The type of paving material to use
- Anticipated loads and traffic
- The kind of subsoil
- The kind of subbase to use
- The need for special treatment of the subsoil
- Water conditions at the site
- Other environmental conditions
- The need for concurrent operations during construction
- Funds available



Only the consultant familiar with all the variables of a given site can properly design the project. Once the specific design is produce appropriate methods can be followed to successfully install the in-pavement lighting system.

The purpose of the following procedure is to provide installers with guidance on how to install the base cans.

The base cans comes with the following accessories:



- Plywood cover 8" Diameter 3/4" Thick
- 6 x Bolts
- Gasket
- 2 x Grommets
- 2 x PVC Fittings for the drain hole

The plywood cover imitates the height of the casting of the 392 fixture- .25".

1. The base cans comes with the cover bolted into the base can and the accessories inside. Remove the cover and get the accessories out. Place the plywood cover back on the base can for concrete pouring.

For Existing Pavements:

2. To install base cans, begin by core drilling holes in the locations specified by the project engineer (*typically 12"-14" in diameter, the depth will be per terrain and/or suggestion of the civil engineer/contractor*). Saw cuts should then be made to allow room for the fixture power cables (typically 3" deep x 1/2" wide). Saw cuts are typically made in line with the centers of the conduit holes.
3. Prepare the drainage system specified by the design engineer. (see figure 1 on page 7 and notes for suggestions)



4. Install the rubber grommets in each of the side holes.



5. Install the base can drain fittings provided (pictured below) into each base can drain hole. Run 1-1/2" size pipe, schedule 40 PVC, into the fittings of the base can. Pipe length should be cut so the pipe, when positioned over the drain, extends approximately 3" to 4" into the drain rock.



External Fitting (Left) and Internal Fitting (Right)



Base Can with fitting installed

6. Use of a mounting jig is recommended for proper alignment of base cans. First, place the plywood cover on the base can, and then mount the mounting jig to the base can with the two bolts that fit into the base can bolt holes.

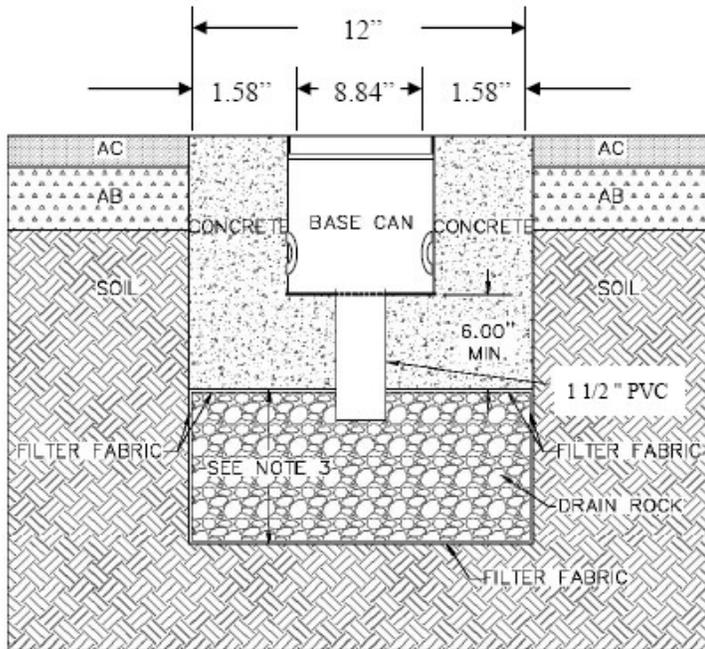




7. After the mounting jig is attached, suspend the base can so the top of the plywood cover is flush with the surface of the pavement. Note: When the fixture is installed (see above), the top of the fixture will mount flush with the surface of the pavement.
8. After the base cans are installed, test the drainage system by pouring water into the installed base can at each fixture location. Pour enough water to verify that the underlying ground is absorbing the water. If the base can is not draining properly, modifications to the drainage system will be necessary. In this case, consult with your project engineer before proceeding.
All electronic parts are inside a weatherproof enclosure inside the fixture. Proper drainage is essential for longevity of the fixture since water intrusion can destroy the electronics inside the fixture. The fixture is weatherproof and some water is expected to enter the base can, but provisions must be made to drain the water. Once satisfied with drainage system, move on to the installation of the fixture power cables.
9. FAILING TO HAVE PROPER DRAINAGE WILL DAMAGE THE LIGHT. FLIGHT LIGHT INC WILL NOT COVER SUCH WATER DAMAGES UNDER WARRANTY.
10. Once satisfied with drainage system, move on to the installation of the fixture power cables.
11. Install the fixture cables. Run fixture power cables to each base can, one black wire, one white wire, and one green wire (grounding) to each can.
12. After all cabling has been completed, encase the base cans and drainage system in concrete. It is recommended that at least 6" of concrete be used below the base. Fill saw cuts with Traffic Loop Sealant, or equivalent.



Figure 1: Base Can Installation – Core Drill and Saw Cut



Notes:

1. Drain rock shall be graded from 1 inch to ¼ inch.
2. Drain rock shall be encased in a filter fabric material to avoid soil infiltration into the drain rock.
3. Recommended depth of drain rock unit varies dependent upon the type of existing soils.
 - a. Where existing soils are granular and permeable the depth of the drain rock unit can be limited to 1 foot.
 - b. Where existing soils are fine graded and have low permeability the depth of the drain rock unit should be increased to 3 feet or greater to provide a reservoir for short term retention. Refer to engineering plans for the requirements specified by the project engineer.
4. Concrete shall be 3/8 inch maximum aggregate mix, use a minimum of seven sacks of cement per cubic yard of concrete and poured from a height of approximately 5 inches above the can. Concrete should only be poured from one side. Vibrate or rod concrete to completely fill the area below and on all sides of the base can. When concrete is visible on the side opposite to the side that concrete is being poured from, pouring can commence from alternate locations.
5. Abbreviations: Asphalt Concrete (AC), Aggregate Base (AB).



For new installations:

For a completely new helipad, before pouring the concrete, create the appropriate drainage system. See Figure 1 on page 7 and notes for suggestions.

1. Install the rubber grommets in each of the side holes.



2. Install the base can drain fittings provided (pictured below) into each base can drain hole. Run 1-1/2" size pipe, schedule 40 PVC, into the fittings of the base can. Pipe length should be cut so the pipe, when positioned over the drain, extends approximately 3" to 4" into the drain rock.



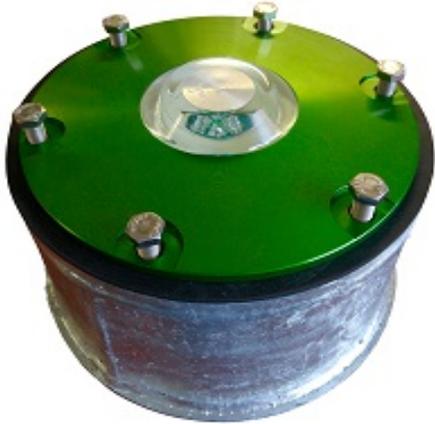


3. After the base cans are installed, test the drainage system by pouring water into the installed base can at each fixture location. Pour enough water to verify that the underlying ground is absorbing the water. If the base can is not draining properly, modifications to the drainage system will be necessary. In this case, consult with your project engineer before proceeding.
FAILING TO HAVE PROPER DRAINAGE WILL DAMAGE THE LIGHT. FLIGHT LIGHT INC WILL NOT COVER SUCH WATER DAMAGES UNDER WARRANTY.
4. Once satisfied with drainage system, move on to the installation of the fixture power cables.
5. Install the fixture cables. Run fixture power cables to each base can, one black wire, one white wire, and one green wire (grounding) to each can.
6. After all cabling has been completed, encase the base cans and drainage system in concrete. It is recommended that at least 6" of concrete be used below the base. Fill saw cuts with Traffic Loop Sealant, or equivalent.

3.4 Setting the Fixture



Flight Light Inc. base cans are galvanized steel and comply with FAA L868AA regulations



The 392 is a semi flush fixture with an inclined casting. This will stand above the level of the pad with about .81"

1. Using electrician's tape, make three wraps around the wires connection.
2. Prior to bolting down the fixtures, coat the mounting flange of each base can and bolt treads with marine grade anti-seize grease, like Corrosion Block or equivalent.
3. Bolt the fixtures to the base cans using the stainless steel bolts provided
4. Fill-in both, the area between the fixture and base can wall and the area in the bolt well, with a silicon sealant such as RTV silicon sealant, or equivalent.

3.5 Tools and Supplies Needed

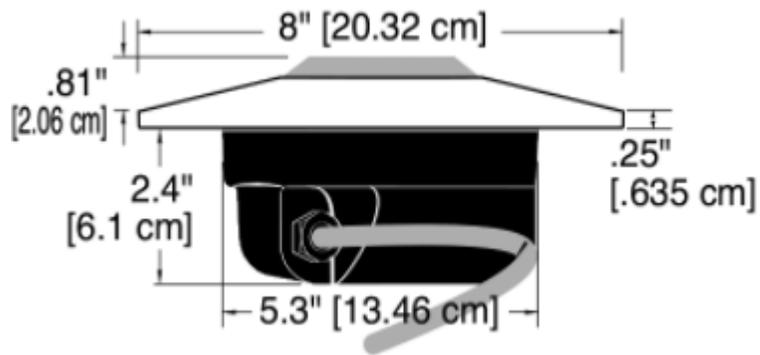
Besides the accessories Flight Light Inc. is providing, the following items may be needed to complete a successful installation:

1. Mounting Jig
2. Junction box
3. Electrical tape



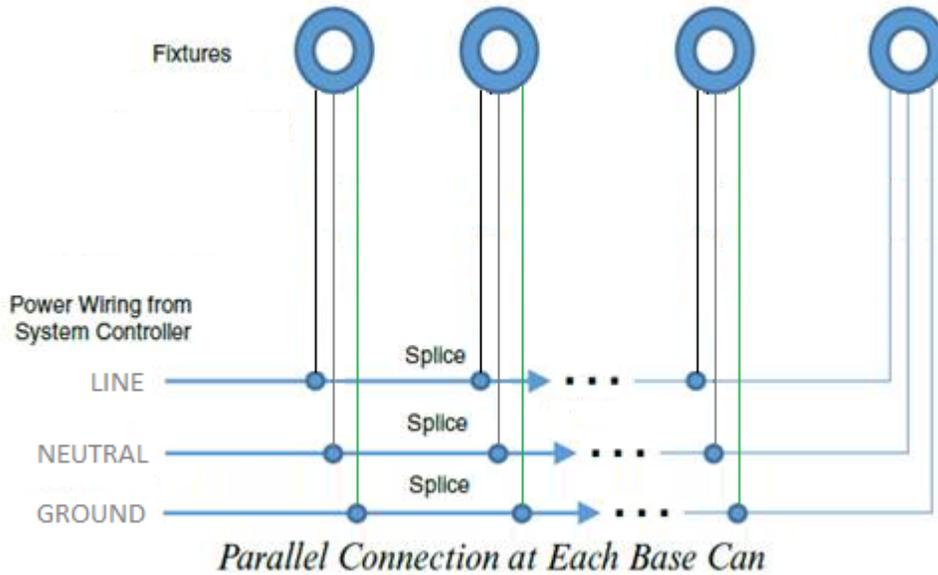
4. Helideck Installation Procedures

- For surface mounting, cut a 5.3" diameter hole in the helideck. Place the HL-392 fixture in the hole and secure with six 3/8" stainless steel flathead screws.
- For mounting under a deck, use an adapter ring or pieces of uni-strut.
- The incoming cable from the helideck should connect to a weatherproof junction box. All luminaire electronic parts are inside a weatherproof enclosure. A water immersion test is performed on all HL-392 light fixtures to ensure moisture sealing before shipping.



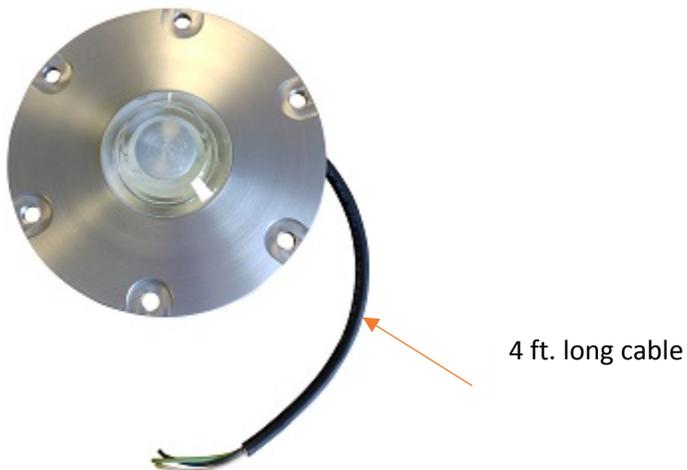


5. Wiring



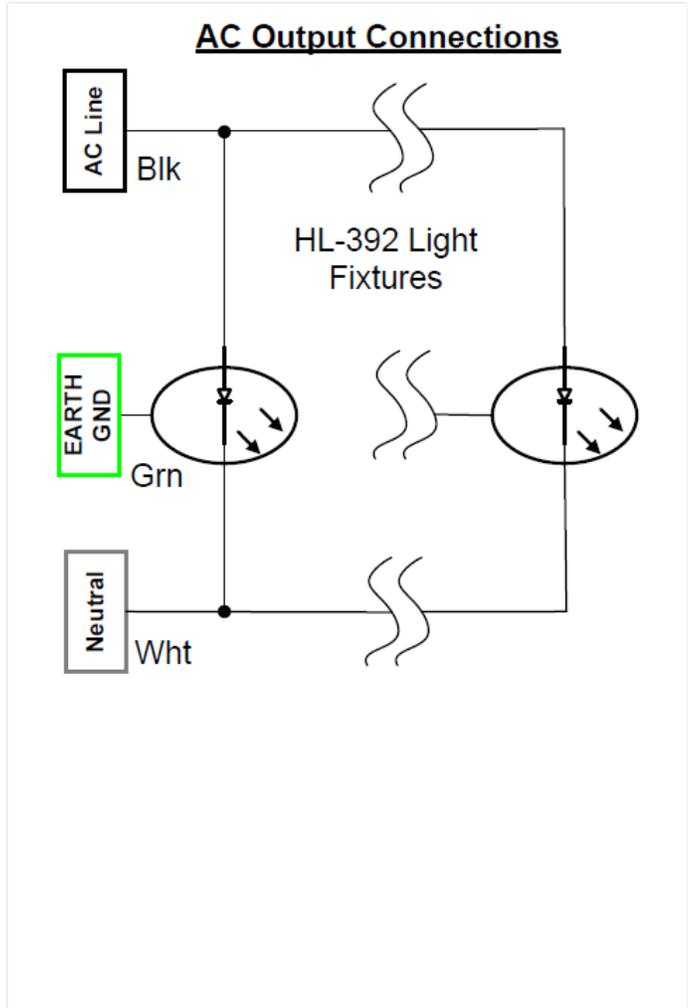
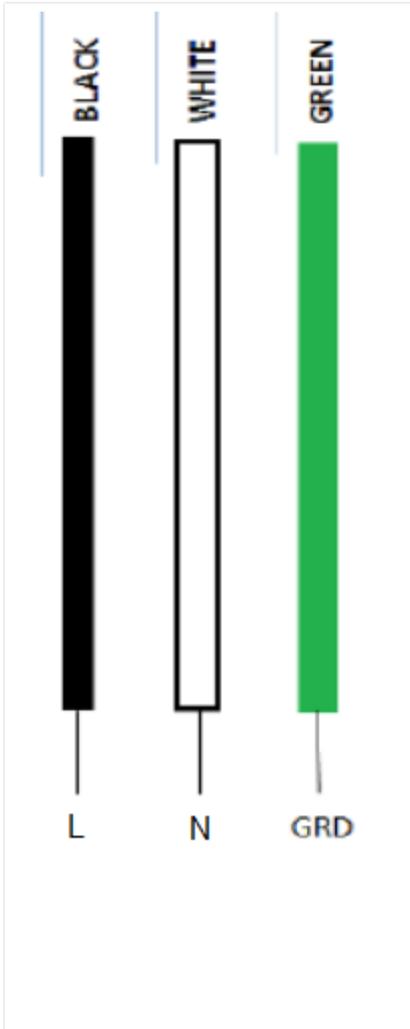
The installation of lights is recommended to be done in a parallel circuit in a secure, waterproof junction box. Junction boxes are not provided with the lights.

The gauge of the electrical wire is to be calculated by the electrical engineer and should be sufficient to handle the rated current and voltage demand.



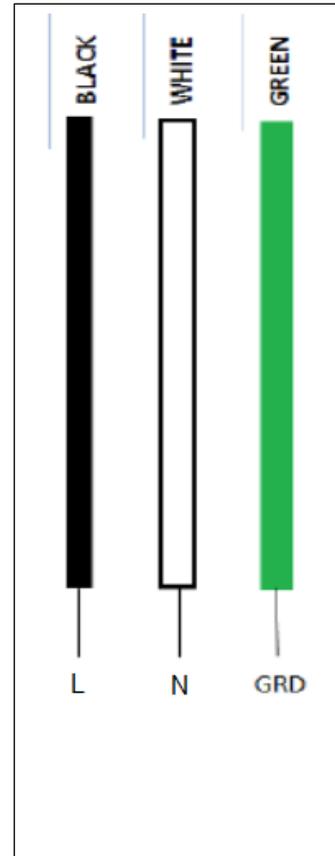
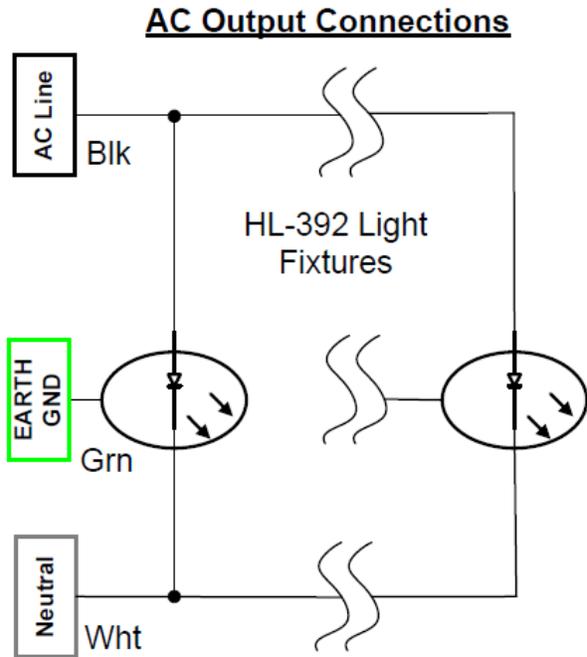


5.1 LED Light AC





5.2 LED AC lights with IR



WARNING! Do not look at Infrared Light Fixtures while they are ON! Infrared light output is hazardous to your eyes.



6. Maintenance



The following general maintenance procedures will help ensure maximum performance and long component life:

- Lenses should be cleaned periodically as an accumulation of dirt, can decrease light output.
- Line voltage should be checked at the fixture and compared with the power supply to be sure it is within the prescribed limits.
- Make certain polarity is correct for DC light fixtures
- Be sure the fixtures are properly grounded.

7. Replacement Parts

LED AC Lights:

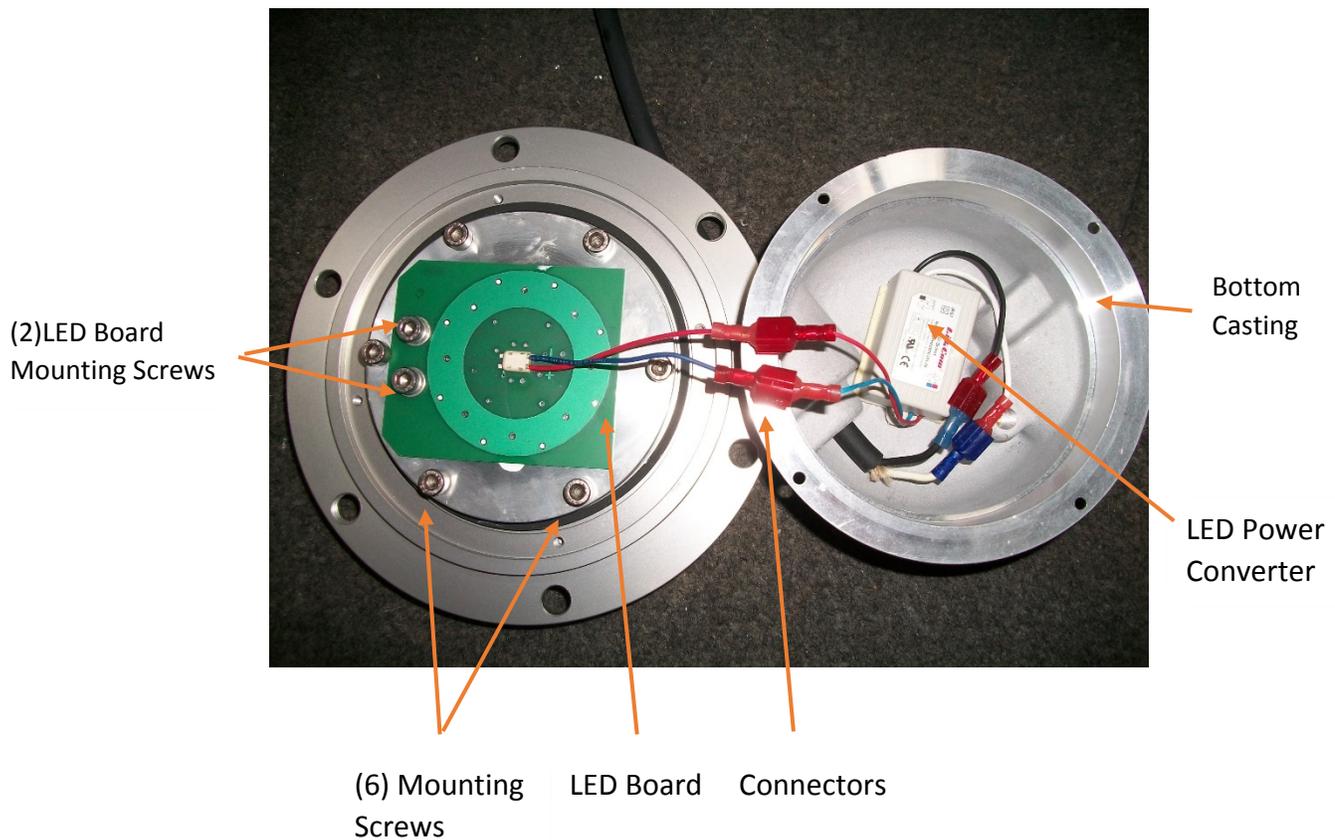
HL-XL8KITB-UL*	UL LED Replacement Kit
80-016080	White Prism
80-021307	Prism Clamp
80-021309	Prism Clamp Gasket
80-033090	Prism Gasket
80-040206	Deep Bottom Cover Casting

*For LED Replacement Kits, X = Color

LED Replacement KIT for Infrared Lights is not available. Infrared Lights need to be returned to factory for repair/retrofit.



8. LED Replacement



To properly replace the LED board and to insure correct seal, follow the below instructions:

- Turn the light upside down and remove the four bottom cover screws
- Unplug connectors coming from the power converter to the LED board
- Remove the two mounting screws holding the LED board
- Remove LED board
- Discard the LED board, the bottom casting with the existing cord and the power converter
- Remove the blue film from the new LED board and put it in place
- Reinstall mounting screws
- Connect the LED board to the power converter
- Make sure the bottom cover gasket is seated properly
- Install the four bottom cover screws back in place



9. Limited Warranty

Duration of the Warranty: Flight Light Inc. warrants all of the goods which it has manufactured to be free of material defects for the following durations.

Lamps: For a period of 90 days from the date of shipment to Buyer. Product liability is limited to lamp replacement and does not include incidental labor.

FAA products: For a period of one year from the date of installation or two years from the date of shipment to Buyer.

LED Light Fixtures: For a period of 2 years from the date of shipment to Buyer. Complete Systems: Systems including at least one Flight Light Inc. Controller and one Flight Light Inc. LED Light Fixture, for a period of 5 years from the date of shipment to Buyer.

Buyer's Remedies: If any such goods are found to be materially defective within the warranty period, Flight Light Inc. agrees to attempt to repair, and if unable to repair, to replace the defective goods without charge to Buyer.

Buyer's remedy with respect to such goods is limited to repair or replacement. For goods not manufactured by FLI, Buyer agrees to accept as its sole remedy the warranty, if any, offered by the manufacturer or manufacturers of such goods. FLI makes no warranties, express or implied, other than those stated in this paragraph.

Warranty Exclusions: Flight Light Inc. shall not be liable under this warranty if any of the following conditions apply:

- 1) Unauthorized personnel attempt any repairs to Flight Light Inc. products without Flight Light Inc. consent.
- 2) Products are damaged by natural phenomenon, misuse, abuse, accident, alteration, or incorrect electrical current or voltage.
- 3) Products are improperly installed, or damaged in shipping.

Warranty Limitations

FLI makes no warranties, express or implied, other than those stated herein. FLI does not warranty the workmanship of the installer, damage caused by acts of nature, vandalism, improper installation, or damage caused by improper maintenance. The warranty period of LED fixtures covered under the 5-year system warranty is reduced to two years when fixtures are subjected to abrasive materials or chemicals. FLI reserves the right to either repair or replace any defective component covered under the terms of any of its warranties. FLI is not an engineering firm and makes no expressed or implied warranty as to the applicability of its products or systems in any specific situation, application or location: such decisions are the responsibility of the owner, design engineer and/ or others. Therefore, as to all goods sold by FLI, FLI hereby disclaims any implied warranty of merchantability or implied warranty of fitness for a particular purpose and Buyer agrees that FLI shall not be liable for any special, indirect, incidental, consequential or liquidated damages of any kind, whether the Buyer's or any other claim is based upon contract, tort or any other legal theory.