

MASTER-LEE ENGINEERED PRODUCTS, INC.



HELIOS-75K AREALITE SYSTEM

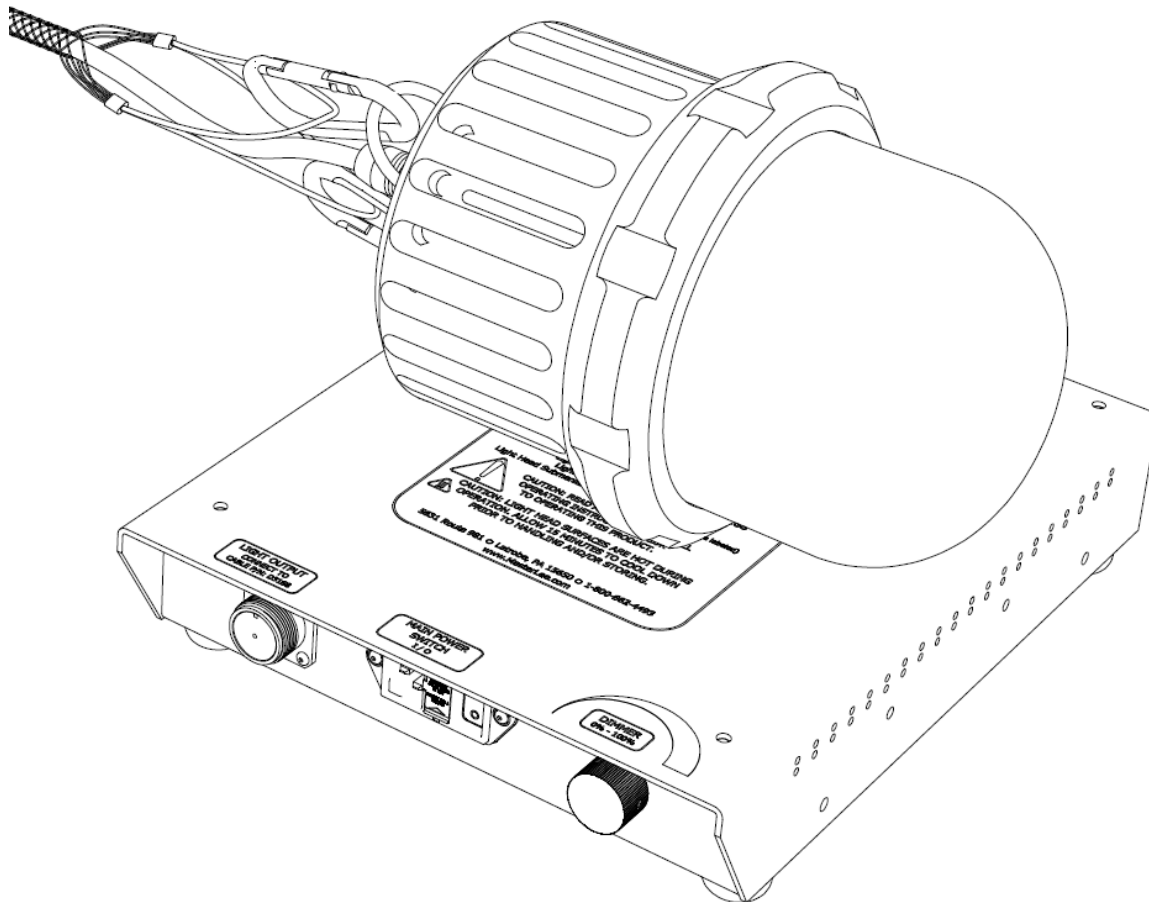
USER MANUAL

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IMPORTANT:

Read Before Using

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1. SAFETY



**”READ AND
UNDERSTAND
ALL**

INSTRUCTIONS” – Failure to follow the SAFETY RULES listed below and other safety precautions, may result in serious personal injury.

Work Area Safety

- **Do not operate light in explosive atmospheres, such as in the presence of flammable liquids, gases or dust.** Excessive heat from electrical sources may ignite dust or fumes.
- **Do not store or operate around rotating/moving equipment.** The electrical cord may become entangled in rotating equipment or severed by moving parts which may cause electrical shock to nearby personnel.
- **Do not handle the light while it’s operating in open-air.** Excessive heat generated in open-air operation may put personnel at risk of burns if handled.

Electrical Safety

- **Before plugging in the light, be certain the outlet voltage supplied is compatible with the voltage identified on the name plate.** Incompatible outlet voltage may result in serious hazards and/or damage to the equipment.

- **Do not expose the Power Console to wet environments.** Water entering the Power Console will increase the risk of electric shock.
- **Never use the cord of the Power Console to carry or support the light. Keep cord away from heat, oil, sharp edges or moving parts.** Damaged cords increase the risk of electric shock.

Personal Safety

- **Do not look directly at the source of light while it is energized.** Temporary or permanent vision impairment may occur as a result.
- **Be sure the dimmer knob is turned to the full “CCW” position before plugging into an electrical outlet or connecting the light cord.** Personal injury, such as vision impairment, may occur if the light is energized in full power in proximity to personnel.
- **Check that all cord connections are tight and secure.** Loose or partial electrical connections may increase the risk of electric shock and/or damage to the components.
- **Do not store anything on top of the Power Console or Light Head.** Placing items on top of the Power Console or Light Head obstructs the view of warning and operating information and may cause damage to the component.



”READ ALL INSTRUCTIONS” – Failure to follow the SAFETY RULES listed below and other safety precautions, may result in serious personal injury.

Operation and Care

- **Ensure the cover of the Light Head is tightly fastened.** If loose, water may enter the enclosure and cause damage to the lighting components. *These are factory torqued to 60 in-lb.*
- **Ensure all cord connectors are free of moisture and are clean before making connections.** Dirt or moisture may cause the light to malfunction and/or may decrease the life expectancy of the components.
- **Handle, package, and use all components with care.** The lens of the Light Head is made of an impact-resistant plastic but can fracture if struck with excessive force causing a hazard and/or Foreign Material risk.
- **Do not position the Light Head in close proximity to moving, mechanical equipment.** Temporary and/or permanent damage to the components may occur if struck, reducing performance of the light or rendering it inoperable.

unqualified personnel may result in incorrect reassembly which could cause serious hazard.

- **Do not remove the cover of the Power Console.** Removal of the cover increases the risk of damage to internal components and electrical shock to personnel.
- **Lens and O-Rings shall be replaced with the manufacturer specified parts as outlined in this document.** Failure to use the specified parts may lead to product failure.
- **Decontamination or cleaning of the lighting assembly shall be performed with care.** Hand-washing with wet rags or a mild cleaning solution may be performed on the lighting assembly and cord. Use of pressure applied water may damage the components.

Service



Disconnect plug from Power Console before

performing any assembly, adjustment or repair to avoid possible injury.

- **Service and/or repair must be performed only by Master-Lee personnel with the exception of lens replacement.** Service or maintenance performed by

SAVE THESE INSTRUCTIONS!

2. ELECTRICAL REQUIREMENTS

- Connect the Power Console plug (included) to a 120-Volt branch circuit with a minimum breaker rating of 15-Amps.
- The Helios-75K is provided with a cord having a 3-prong, grounded plug, w/ locking system. Only plug the cord into outlets also having a 3-prong outlet of the same size.
- Replace damaged cords immediately. Use of damaged cords can shock, burn or electrocute.
- If an extension cord is necessary, a cord with adequate size conductors should be used to prevent excessive voltage drop, loss of power or overheating. The table below shows the correct size to use depending on cord length.

Recommended Size of Extension Cord

Cord Length (ft)	Cord Size in A.W.G
25	18
50	16
100	12

3. INSPECTION

- **Inspect Light Head and lens for water infiltration and/or damage.** Failure to replace the lens, if visibly damaged or discolored, may result in breakage, poor performance, or water leaks. The lens should be completely transparent. Discoloration of the lens may indicate embrittlement due to excessive radiation exposure.
- **Inspect all hardware and fasteners for signs of degradation, damage, or wear.** Failure to replace damaged fasteners may result in electrical and/or mechanical failure.
- **IF used in the reactor core or within close proximity of irradiated fuel assemblies, THEN perform a visual inspection after approximately 7-10 days of exposure to the radiation.** Failure to inspect and replace the lens, as necessary, may increase the risk of breakage and reduce the emission of light.
- **Inspect cable strain relief and carabiners for signs of degradation, damage, or wear.** Failure to replace damaged support components may result in damage or personnel injury.
- **Inspect electrical cables for cuts, wear, fretting, kinks, or any visible signs of degradation.** Use of damaged electrical cables may increase the risk of electrical shock.
- **Inspect electrical fittings for wear, damaged threads, or bent pins.** Use of damaged electrical fittings may increase the risk of electrical shock.
- **Inspect components for cleanliness.** Dirt, oil, or chemicals may impair performance and longevity of the components.

4. OPERATION INSTRUCTIONS



Injury to personnel may occur from looking directly at the energized light source or from physically touching the light body, which may be hot.

IMPORTANT INFORMATION:

The Helios-75K light Head is equipped with an automatic thermal regulation control circuit which protects the components from overheating and damage. Water is the ideal coolant to permit the light Head to operate continuously at 100% power. When operated in open air, the Helios-75K will slowly reduce output power to maintain safe operating temperatures. After extended use in open-air the output level will be at approximately 35% power.

4.1. Instructions for connecting the Light Head Cable

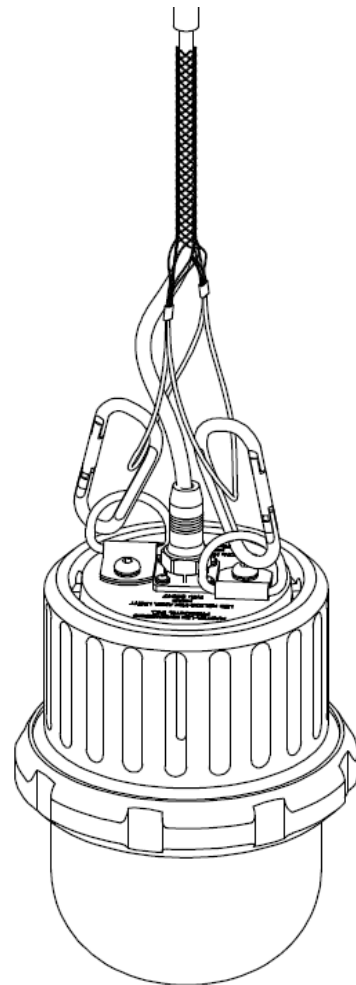
- 4.1.1. Verify cleanliness of the connectors.
- 4.1.2. Connect the Light Head Cable to the Power Console, ensuring the keyways are aligned correctly.
- 4.1.3. Lightly hand-tighten the fitting until it is firmly tight.
- 4.1.4. Connect the Carabiners to the clips on the Light Head.
- 4.1.5. Ensure slack exists in the cable when the Light Head is free-hanging, as shown. *This is done by sliding the cable strain relief upwards or downwards on the cable.*



Injury to personnel may occur IF the energized Head is touched while operating. Allow a minimum of 15 minutes for the Light Head to cool down prior to handling.

4.2. Instructions for turning ON the Light Head

- 4.2.1. Verify the Dimmer Control knob is fully turned to the “CCW” position.
- 4.2.2. Verify the Light Head is properly and safely positioned (i.e. away from personnel, combustible materials, etc.).
- 4.2.3. Plug the power cord into a properly rated electrical outlet.
- 4.2.4. Depress the Power “I/O” rocker switch to turn on the light.
- 4.2.5. Slowly turn the Dimmer Control knob “CW” to the desired light level.



4.3. Instructions for installing/removing the Light Head into/from the reactor vessel.

- 4.3.1. Ensure all electrical connections are tight, the carabiners are securely attached, slack exists in the cable between the Light Head and strain relief, and the light functions normally.
- 4.3.2. Perform a final visual FME inspection of all components entering the water.
- 4.3.3. Slowly lower the Light Head into the water using the Light Head Cable.
- 4.3.4. Position the Light Head over the reactor vessel core and continue lowering it to the desired position.
- 4.3.5. The Light Head is designed to disperse light in all directions below its elevation.
- 4.3.6. When activities are completed, slowly raise the Light Head from the reactor vessel using the Light Head Cable.

4.4. Instructions for turning OFF the Light Head

- 4.4.1. Depress the Power “I/O” rocker switch to turn off the light.
- 4.4.2. Verify the Head is not emitting light.
- 4.4.3. Unplug the power cord from the electrical outlet.
- 4.4.4. Allow a minimum of 15 minutes for the Light Head to cool down prior to handling.

5. LENS & O-RING REPLACEMENT



Power cord must be disconnected from an electrical source prior to performing service. Failure to remove electrical potential to the Light Head will increase the risk of electric shock.

- 5.1. Securely hold the upper end of the Light Head, ensuring soft material is placed around the Light Head to protect the surface from scratching.
- 5.2. Using a spanner wrench, strap wrench, or gripped with your hands, loosen the collar of the Light Head.
- 5.3. Remove the Collar and set aside.
- 5.4. Remove the lens and dispose.
- 5.5. Remove the two (2) O-rings and dispose.
- 5.6. Lightly apply Molykote 111 or a standard O-ring lubricant to the new O-ring.
- 5.7. Install the new O-rings onto the Light Head body ensuring they do not twist or kink.
- 5.8. Clean and inspect the new lens (verify free of cracks, scratches, discoloration, etc.).
- 5.9. Install the lens.
- 5.10. Install the Collar and firmly tighten by hand, THEN tighten ¼ turn using a strap wrench.

6. PARTS LIST



Failure to use replacement parts as identified herein or as recommended by the manufacturer may result in reduced performance and/or the potential risk of hazard or injury to personnel.

<i>Part No.</i>	<i>Description</i>	<i>Provided w/ System</i>	<i>Quantity</i>
D3346	Helios-75K AreaLite System, includes the following items:	n/a	1
D3347	Helios-75K AreaLite Head w/ 100' cable	Yes	1
D3189	Power Console with: - Detachable and locking 6' power cord	Yes	1
D2834	Helios-75K AreaLite Lens Replacement Kit, includes: - (1) Globe - (2) O-Ring - (1) Molykote 111 (pack)	Yes	2

7. TECHNICAL SPECIFICATIONS

<i>Lighting/Electrical</i>	
Operating Voltage	90~305 VAC, 50~60Hz
Current @ 100% Power	Up to 5.0 Amps AC
Size/Weight (Power Console)	13" x 11" x 3"; 12 lbs.
Light Output	Up to 78,000 Lumens
Light Color Temperature	5000K (white light)
LED Life	50,000 hours (>70% lumen output)
Radiation tolerance	Approved for extended use in Reactor Core & near fuel assemblies
Waterproof depth rating	100-ft
Dimming	100-10% manual; 100-30% auto (temperature based)
Light Panel positions	Vertical hanging
Operating temperature (8F)	165 (max. in-air); ~135 (in water)
Power Factor %	98
LED Efficacy (@ 85C)	152 lumens/watt
LED Flux (@85C)	70,900 lumens
FME Equipped	Yes
Protection	Thermal Overload; Short Circuit; Over Voltage; Fuse
Warranty	2-Year; Limited; Parts replacement

<i>Physical – Panel Light</i>	
Part Number	D3347
Length	9 in
Height	7 in
Width	3 in
Weight	15 lb
Cable	100' Length; Rubber jacket
Material	MIL-A-8625-Type III, Hard coat anodized aluminum; Stainless steel protective lens cover
Lens Material	Polycarbonate