
Technical Installation and Service Manual – V2.2
Precision Approach Path Indicator (AV-PAPI)
Constant Current Powered Systems
FAA - Style B, ICAO

December 2022



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Manual Updates

VERSION NO.	DESCRIPTION	DATE	REVIEWED	APPROVED	DESIGN
V1.5	Manual Launch	June 2020	J. Putaansuu	J. Barry	R. Crosby
V1.6	Added Mounting Heights to Specifications	August 2020	J. Putaansuu	D. Shemwell	R. Crosby
V1.7	Updated AV-PAPI Kit Contents	September 2020	A. Shmais	J. Barry	R. Crosby
V1.8	Updated Input Current Range; Added Photobiological Safety Standards to Specifications	December 2020	J. Barry	J. Barry	R. Crosby
V2.0	Reformat Manual	April 2022	J. Barry	J. Barry	R. Crosby
V2.1	Add Wiring Overview	May 2022	C. Johnson	J. Barry	R. Crosby
V2.2	Update to 200W Transformer	December 2022	P. Naidu	J. Barry	R. Crosby

Acronym List

ACRONYM	DEFINITION
AC	Alternating Current
Ah	Amp-hour
AH	Altitude/Height
CCR	Constant Current Regulator
DC	Direct Current
EMT	Electrical Metallic Tubing
FAA	Federal Aviation Administration
ft.	Feet
Hz	Hertz
in.	Inches
kg	Kilogram
lb	Pound(s)
LED	Light-Emitting Diode
LHA	Light Head Assembly
mm	Millimeter
PAPI	Precision Approach Path Indicator
PCB	Printed Circuit Board
P/N	Part Number
V	Volt
W	Watts

Safety Summary

The following are warnings and cautions personnel must understand and apply during installation, operation, and maintenance.



WARNING indicates that serious bodily harm or death may result if precautions are not followed.

CAUTION

CAUTION indicates that damage to equipment may result if instructions are not followed.

	WARNING
CAUTION	DO NOT look into lenses that are actively emitting light. The lights can be bright enough to be harmful to the eyes. CAUTION Always follow these instructions when handling PAPI components: • The LHAs contain glass components. Do not drop! • Never step on top of the LHA • Always follow the instructions outlined in this manual when cleaning the equipment. Improper cleaning methods and use of unauthorized cleaning agents can damage equipment.
CAUTION	CAUTION DO NOT install battery backwards in inclinometer. To ensure accurate readings, calibrate the digital inclinometer before using. Refer to instructions included with the inclinometer.
CAUTION	CAUTION Heated lens option <u>required</u> for all PAPIs used in sub-zero or arctic conditions.

1. Precision Approach Path Indicator (PAPI) – Style B

1.1 Introduction

The AV-PAPI Series 3 system (Style B) is an LED light that provides precision glideslope information to pilots on approach to the runway. The PAPI system provides corridors of red and white lights emanating from a location off to the side (usually the left) of the landing zone. Properly located and installed, PAPI lights maximize aircraft rollout and safety margins for protection of both the pilot and the aircraft.

The Style B AV-PAPI Series 3 is powered by traditional CCR circuits used in airport lighting via 200W isolation transformer (L-830, L-831). The LHAs communicate with each other via CAN bus connected to each LHA. The intensity of the LHAs is determined by the primary CCR current setting.

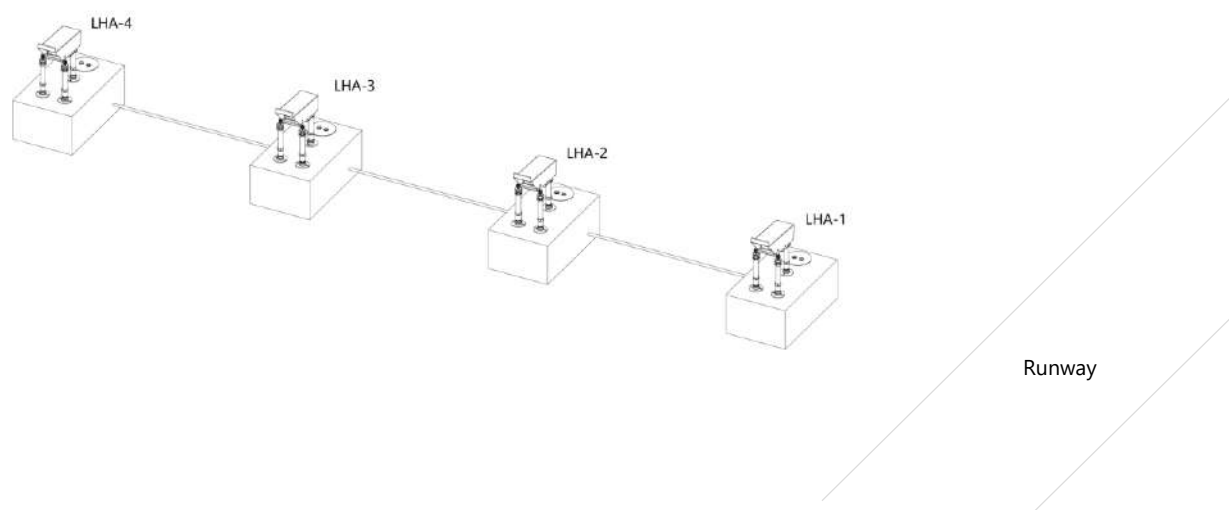


Figure 1. 4-Box Configuration for PAPI Component System

1.2 Components

The Style B PAPI Series 3 system consists of two or four LHAs with the following options:

- Heated lens
- Tilt switch
- Fault monitoring

Also included are:

- Inclinator
- Connection wire
- Flex conduit
- Frangible mounting system

Customer Supplied:

- Four 200W min isolation transformers

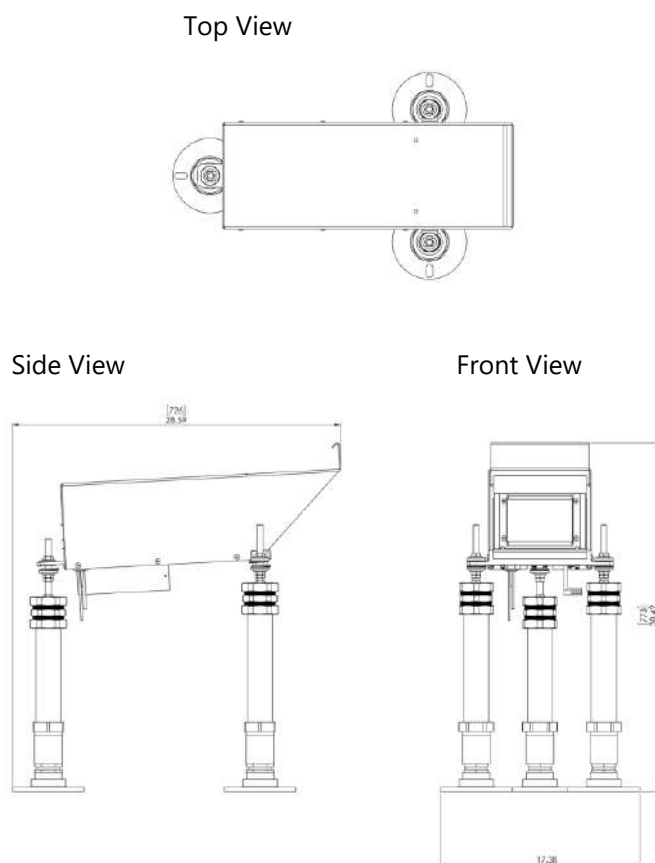


Figure 2. LHA Line Diagram, 3 Views



NOTE:

Heated lens option required for all PAPIs used in sub-zero or arctic conditions.

Heated lens and tilt switch required for FAA Certification.

1.2.1 Light Head Assembly (LHA)

The PAPI Light Head Assembly provides visible approach lighting. It consists of an Optical Head Enclosure and a control box assembly that houses the electronic components, including the LED driver board PCB assembly, and a CCR power converter PCB assembly. The LED array intensity is dependent on the CCR current setting according to the following table:

Table 1. CCR PAPI LED Array Intensity

CCR CURRENT SETTING	PAPI INTENSITY	DESCRIPTION
6.6A	100%	FAA Step 3, ICAO Step 5
5.5A	34%	FAA Step 2
5.2A	24%	ICAO Step 4
4.8A	15%	FAA Step 1
4.1A	6%	ICAO Step 3
3.4A	0.8%	ICAO Step 2
2.8A	0.16%	ICAO Step 1

The LHA includes:

- A white LED cassette with heat sink
- A red LED cassette with heat sink
- A mirror assembly
- A lens assembly at the front of the LHA (optionally heated)
- A LED driver board (PCB)
- A CCR power converter board (PCB)
- A tilt switch assembly (optional for non-FAA airfields)
- A power cable connectorized for the secondary of the isolation transformer (L-823, Style 1)
- A CAN bus cable for communicating with the other LHAs in the system



NOTE:

There is a CAN bus terminating resistor in the electronics enclosure of LHAs 1 (closest to the runway) and 4 (furthest from the runway). It is important for proper CAN bus communications that the terminating resistors be in the two LHAs on either end of the row.

- An optional fault monitoring cable connectorized for the secondary of a second isolation transformer (L-823, Style 1)

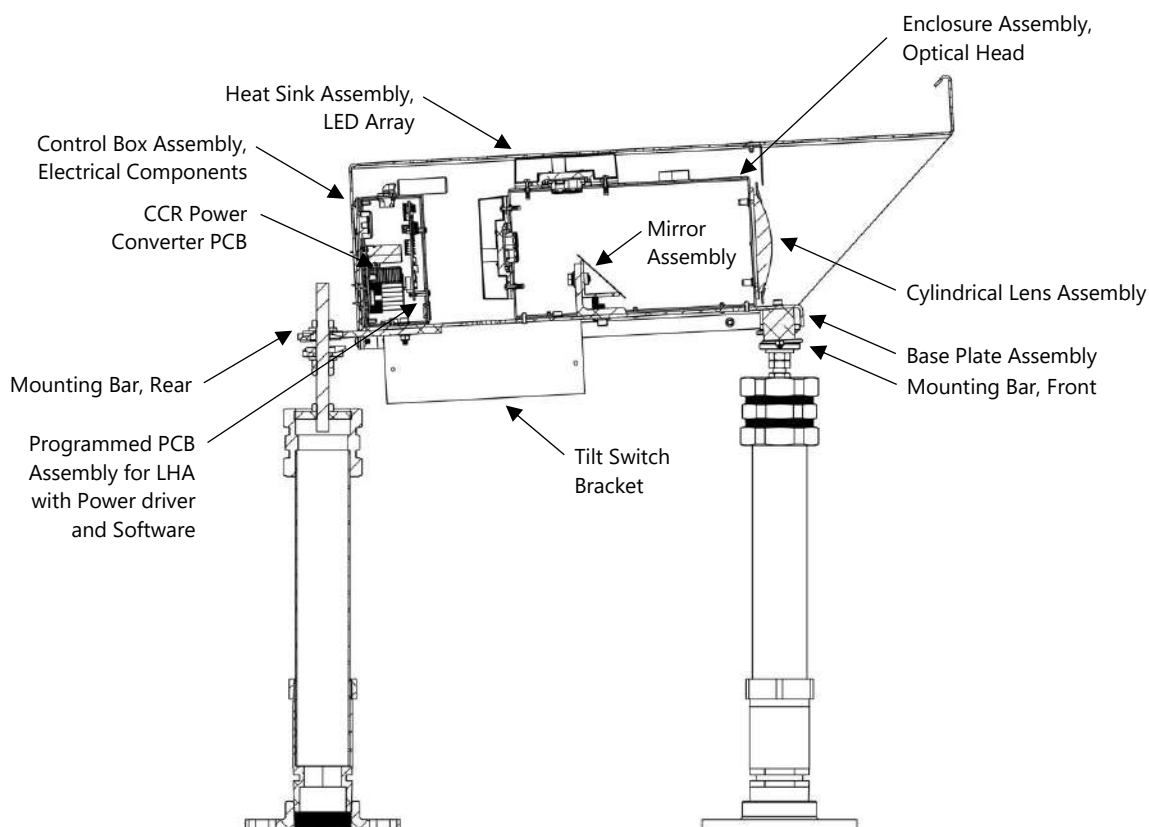


Figure 3. Sectional View of Light Head Assembly

1.2.2 Heated Lens

The heated lens circuit is microprocessor controlled to eliminate rapid on/off cycling thereby minimizing power consumption. It will be activated to ON when temperatures fall below the set point of 50°F [10°C]. The heater will turn OFF above the set point.

1.2.3 Tilt Switch

The efficacy of PAPI systems is contingent on all the beams of LHAs angled correctly with respect to one another and with respect to the desired glideslope.

If a PAPI's angle is incorrect, it could provide an incorrect glideslope indication to the aviator, so PAPIs are designed to operate in a "fail safe" manner. By using electromechanical tilt switches to detect a PAPI's angle, the system will only emit light if all LHAs are in the correct angular position as per the prescribed system configuration and set up. Each LHA is equipped with a tilt switch mechanism. If any LHA deviates from its angular set position, all LHAs in the system will be deactivated with a 10-30 second delay to prevent faults due to momentary vibration.

1.2.4 Inclinator (Digital Protractor)

A digital inclinometer, also known as a digital protractor, (Avlite P/N: AV-INCL-KT) is included to set the side-to-side level and tilt angles for the LHA. Refer to the Owner's Manual included with the digital inclinometer for user instructions. Be sure to calibrate the digital inclinometer prior to use.



NOTE:

ALT Zero and the Hold functions are not used for this application.

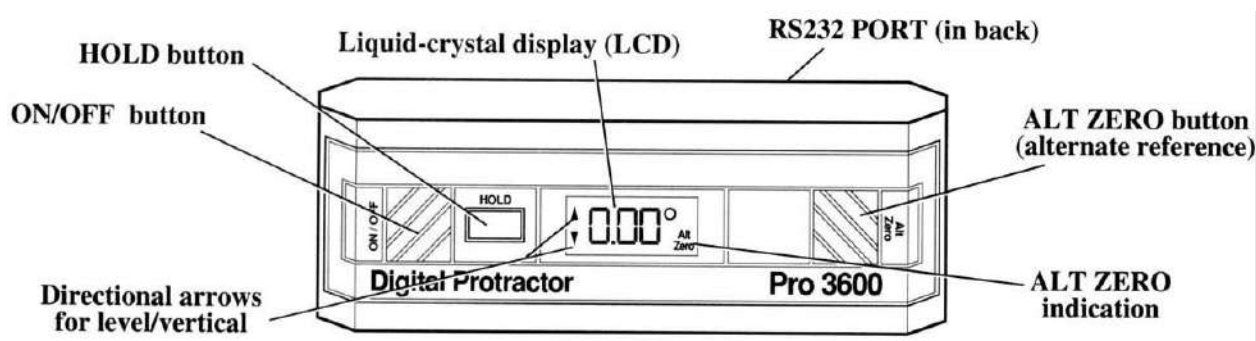


Figure 4. Inclinator

1.2.5 Fault Monitor Relay

The AV-PAPI Style B is available with an optional relay that opens when an LHA fault is detected or power to the LHA is lost. It is equipped with the same style connector as the main power connector to the LHA, and is intended to connect to a second isolation transformer for remote monitoring of the LHA operating condition.

1.2.6 External Baffles (Optional)

External baffles (also known as blanking devices) are available to modify the horizontal light beam coverage of the PAPI obstacle avoidance in the approach area and light signal obstruction clearance zone.

1.3 Wiring Overview

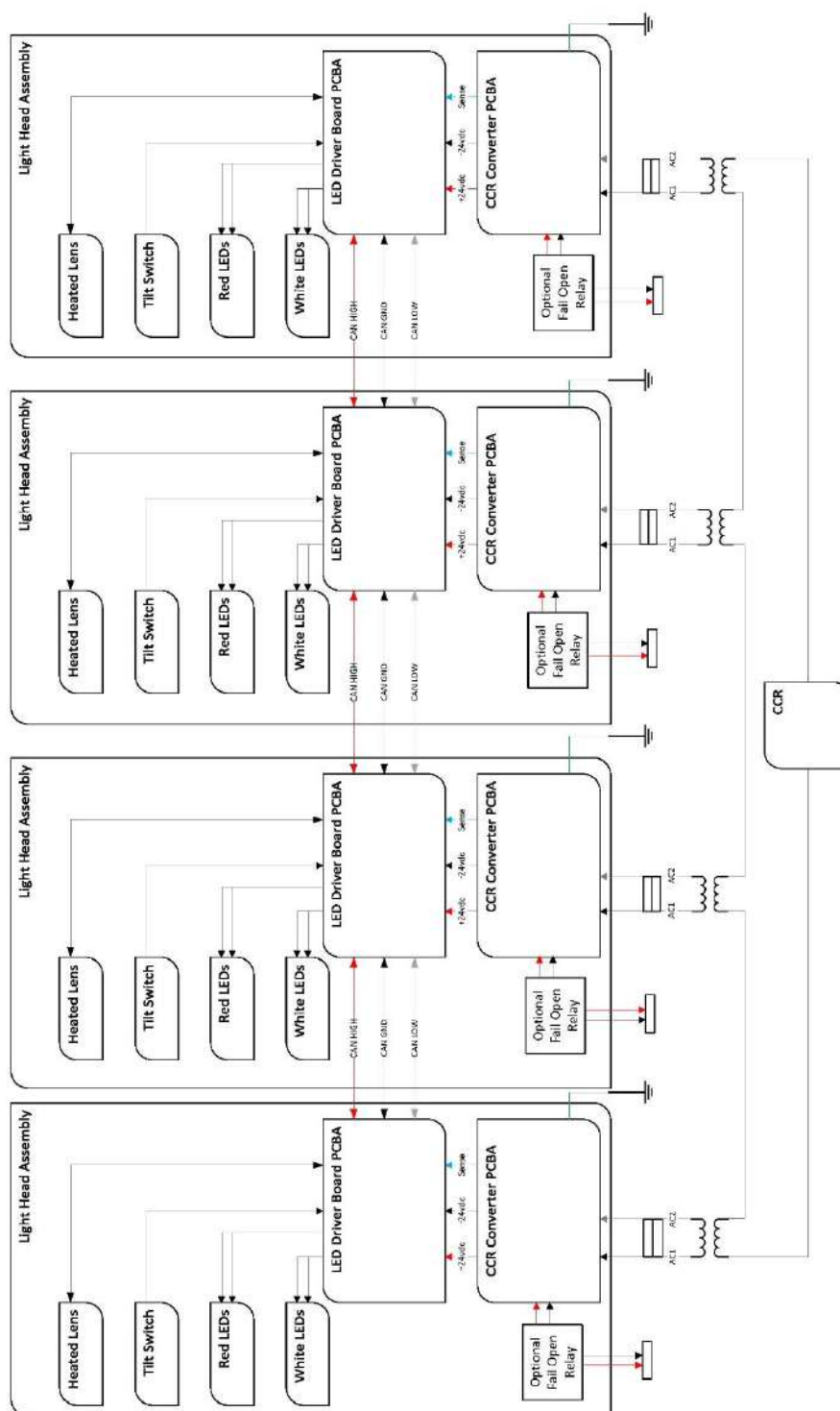


Figure 5. System Level Block Diagram

2. Installation and Operation

2.1 Pre-Installation Considerations

2.1.1 Site Requirements

The length and width of the concrete pad should extend 12" [305 mm] beyond the LHA weather cover in all directions. The depth of the foundation shall be a minimum of 36" [914 mm] or 12" [305 mm] below the frost line, whichever is greater.

The distance between the two front supports is 11.13 inches.

Aiming angle and location of the LHAs shall be as indicated on the runway plans or other contract documents.

2.2 Installing the Series 3 PAPI System

List of high-level steps required for installing the AV-PAPI Series 3:

1. Research federal, state, and local requirements for concrete pad, conduit and PAPI installation.
2. Install underground electrical conduit used to connect the LHAs.
3. Pour concrete pads for LHAs depending upon AV-PAPI configuration.
4. Install LHAs.
5. Install power.
6. Complete wiring.

2.2.1 Unpacking

Unpack all hardware and inspect for damage. If there is any damage, please contact your Avlite Office. Retain original packing material for possible future use in shipping.

2.2.2 Tools Required (Not Supplied)

Table 2. Tools Required for PAPI Installation

TOOLS REQUIRED	QUANTITY
#1 Phillips Screwdriver	1
#2 Phillips Screwdriver	1
Large Flat Bladed Screwdriver with 5/16" (8mm) tip	1
Small Flat Bladed Screwdriver with 1/8" (3mm) tip	1
9/16" (15mm) Combination Wrench, socket, or adjustable spanner	1
3/4" (19mm) Combination Wrench, or adjustable spanner	1
3/16" Cabinet Tip Flat-Bladed Screwdriver	1
3-3/8" (85mm) Capacity Adjustable Spanner or Pliers	1
10" Tongue and Groove Pliers	1
Wire Stripper(s) for use with 22 AWG (0.3mm ²) and 12 AWG wire (3.3mm ²)	1
Crimper for Insulated Terminals	1
Electrical Tape	1
Utility Knife	1

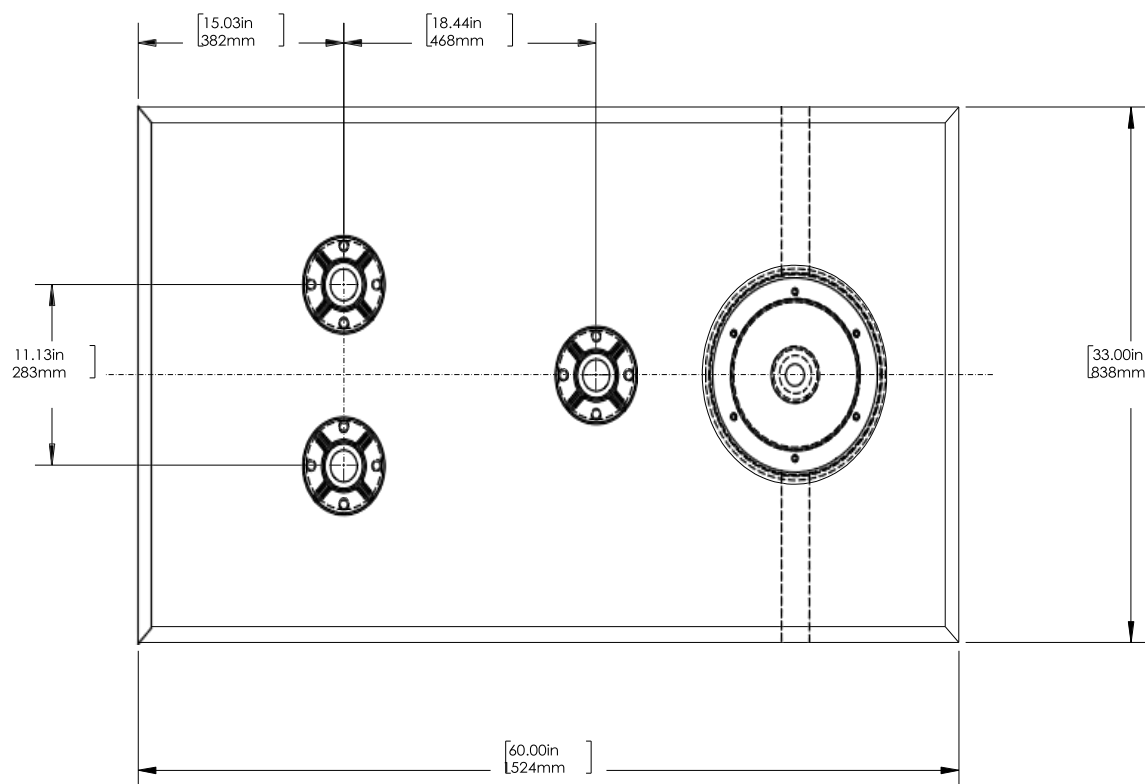
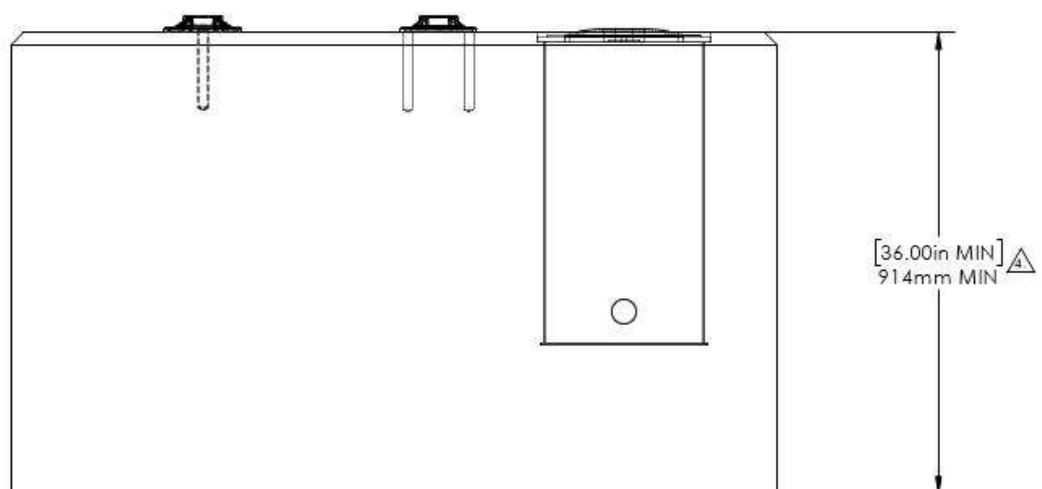
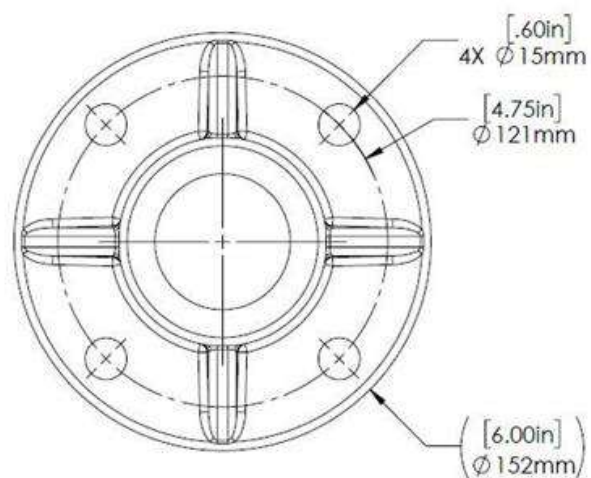


Figure 6. Plan View Indicating the Distances between the Front Three Legs of the LHA



Elevation View



Plan View of Flanges

Figure 7. Bolt Circle of Mounting Flange

2.2.3 Positioning the LHAs

Position the AV-PAPI near the runway in accordance with specifications from either FAA or ICAO. An example of typical placement involves positioning the AV-PAPI to the left of the runway as seen by the approaching aircraft across from the touchdown zone. Location is determined based on:

- Site requirements
- Runway grade
- Nominal glideslope angle
- LHA height above ground

Site requirements are more complex than shown in the following illustration. Aircraft type, grade of runway, and whether there is an Instrument Landing System (ILS) are just a few factors to consider. Additionally, there are different rules for general aviation runways used by non-jet aircraft.

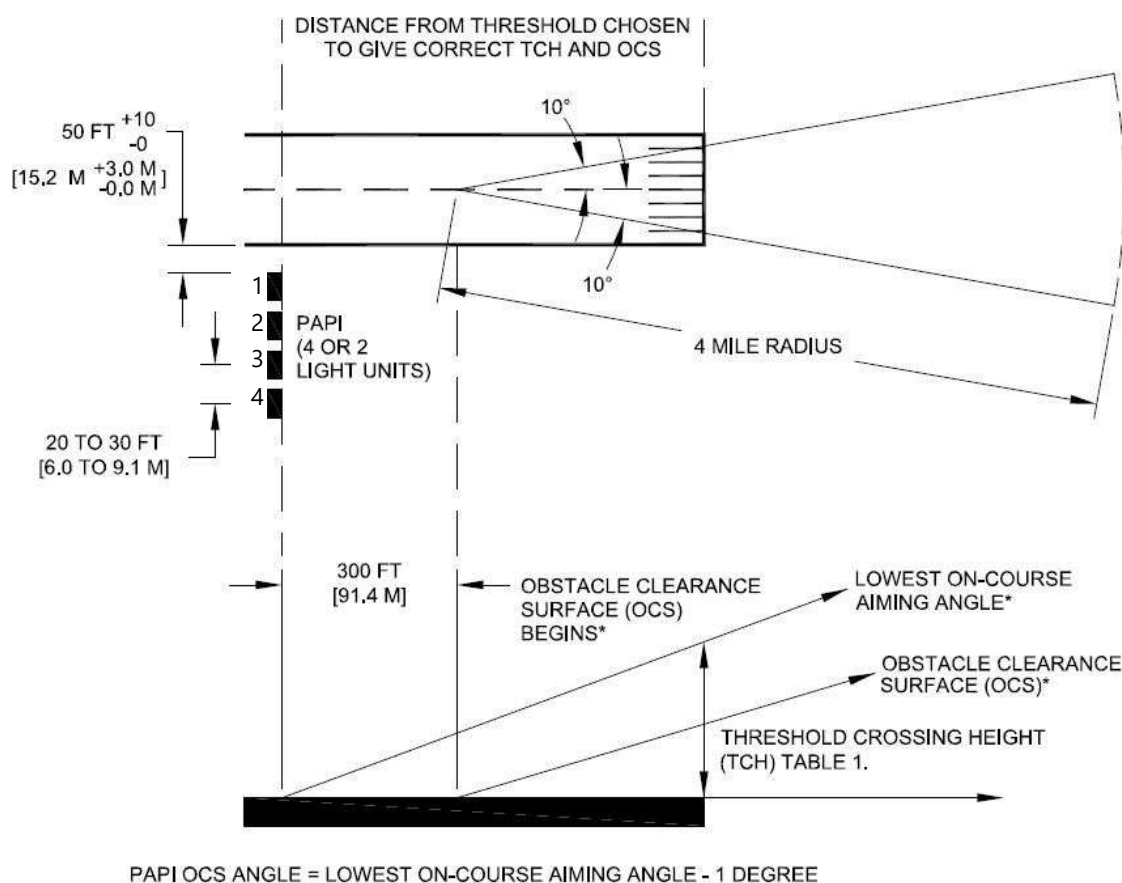


Figure 8. PAPI LHA Runway Layout (FAA AC 150/5340-30D)

Figure 8 above is an example only. The installer is responsible for positioning the LHA in accordance with specifications from all appropriate regulatory agencies.



NOTE:

1. The visual glide path angle is the center of the on-course zone, and is a nominal 3 degrees when measured from the horizontal surface of the runway.
 - a. For non-jet runways, the glide path may be raised to 4 degrees maximum to provide clearance.
 - b. If the PAPI glide path is changed to a higher angle from the nominal 3 degrees, it must be communicated in a notice to airman (NOTAM) and published in the airport facility directory.
2. PAPI obstacle clearance surface:
 - a. The OCS begins 300 ft. in front of the PAPI system.
 - b. The OCS is projected into the approach zone one degree less than aiming angle of the third light unit from the runway for an L-880 system, or the outside light unit for an L-881 system.

2.2.4 Light Head Assembly Setup

For permanent installation, mount each of the three LHA legs on concrete pads using frangible couplings, tubing, and threaded rod. Position the shorter leg on the rear flange and the longer legs on the front flanges. Use the following diagram to assemble the LHAs.

STEP	ACTION
1	Using a 3/4 in. wrench, remove the top hex jam nuts, oversize washers, and alignment washers on each of the legs.
2	Position the bottom hex jam nuts, oversize washers, and alignment washers on the threaded rod on all three legs of each LHA near the middle of their adjustment range.
3	Orient each LHA so that the front (the side with the glass lenses) faces the approach end of the runway.
4	Lower the LHA housing onto the three sets of bottom hex jam nuts, oversize washers, and alignment washers on the threaded rods of the legs.
5	Install three other sets of hex jam nuts, oversize washers, and alignment washers onto the threaded rods.
6	Position each LHA on a line perpendicular to the runway centerline within +6 in.

2.2.5 Wiring

Table 3. Wiring

WIRE NO.	SIGNAL	COLOR	SIZE	FUNCTION
1	CAN_H	Red	22 AWG [0.3 mm ²]	High of the CAN bus Signal Pair
2	CAN_L	White	22 AWG [0.3 mm ²]	Low of the CAN bus Signal Pair
3	CAN_GND	Black	22 AWG [0.3 mm ²]	Ground Reference for the CAN bus – Isolated from the Main DC Power Ground

2.2.6 Aiming the Light Head Assemblies

STEP	ACTION
1	Center the inclinometer in the front of the base plate. If the optical head is dirty, clean the base plate in the spot where the inclinometer is placed.
2	Rotate the inclinometer so that it aligns with the front edge of the base plate, perpendicular to the runway direction.
3	Adjust the incline angle by turning the lower jam nuts on the threaded rods of the legs.
4	Use a 3/4 in. wrench to adjust the position of the jam nuts. To do this: - Loosen the upper jam nuts. - Adjust the leg height by turning the lower jam nuts adjacent to the spherical washers. - Use the upper jam nuts to lock the position after the adjustment is completed.
5	Adjust one front leg shorter, and the other front leg longer until the inclinometer indicates level within + 0.05° (3 arcmin).
6	Clean the inclinometer bracket.
7	Place the inclinometer on the top of the inclinometer bracket and tighten the thumb screws.
8	Loosen the upper jam nut on the rear leg of the LHA.
9	Adjust the bottom jam nut on the rear leg of the LHA until the incline angle is proper according to the appropriate regulatory agency.
10	Set LHA-1 (nearest runway) to 3° 30 min.
11	Set LHA-2 (next adjacent) to 3° 10 min.
12	Set LHA-3 to 2° 50 min.
13	Set LHA-4 (outermost) to 2° 30 min.
14	Adjust until the inclinometer indicates the proper angle with +0.05° (3 arcmin).
15	Move the inclinometer back to the position for measurement of the side-to-side level.
16	Repeat the level adjustment by moving one leg down and the other up an equal amount.
17	Move the inclinometer back to the inclinometer bracket.
18	If the incline angle has changed, repeat adjustment until it is properly set.

19	Continue adjustments until the incline angle and the side-to-side level are within tolerance.
20	Remove the inclinometer from the optical head.

Table 4. 4-Box PAPI Typical Inclinometer Incline Angles and Tolerances for 3" Glideslope

POSITION	STANDARD AIRCRAFT	LARGE AIRCRAFT* ON RUNWAY WITH ILS	TOLERANCE
LHA-1	3° 30 min. (3.50°)	3° 35 min. (3.58°)	3 min. (+0.05°) -0 min. (-0.0°)
LHA-2	3° 10 min. (3.17°)	3° 15 min. (3.25°)	
LHA-3	2° 50 min. (2.83°)	2° 45 min. (2.75°)	
LHA-4	2° 30 min. (2.50°)	2° 25 min. (2.42°)	

Table 5. 2-Box Typical Inclinometer Incline Angles and Tolerances for 3" Glideslope

POSITION	INCLINE ANGLE	TOLERANCE
LHA-1	3° 15 min. (3.25°)	3 min. (+0.05°) -0 min. (-0.0°)
LHA-2	3° 45 min. (2.75°)	

2.2.7 Focusing

Each LHA is focused at the factory. Focusing by the user is not possible.

2.3 Adjustment of Excessive Tilt Mechanism

The following procedure can only be performed successfully once the correct incline angle for each LHA has been determined and set in accordance with the desired glideslope angle, and the lights have been tested for the desired intensity setting.

To set the tilt:

STEP	ACTION
1	Slightly loosen both screws (with a Hex Key screwdriver) that hold the tilt switch, but DO NOT remove them. The screw closest to the back of the LHA is for the pivot hole.

	The screw closest to the lens is for the adjustment slot and allows the up/down adjustment and locking of the tilt switch angle.
2	Verify that the lower surface of the tilt switch mechanism and the upper surface of the inclinometer is clean. If dust, dirt, or debris is present, gently remove it.
3	Place the top surface of the inclinometer flush against the bottom surface of the tilt switch mechanism and hold it firmly.
4	Slowly move the left side of the tilt switch mechanism up or down until the inclinometer reads at 0 degrees +/- .02.
5	Tighten the right pivot screw securely – but not too tight - and lightly tighten the left adjustment screw.
6	Tighten both screws to ensure the tilt switch position will not move.


NOTE:

It may be necessary to gently tap the left side of the tilt switch mechanism up or down a few times with a finger to adjust for final level after tightening the screws.

Inclinometer and Tilt Switch must be clean and free of debris to ensure accurate [tilt] angle is achieved.

The “closed” range of the tilt switch is within the angular range of +0.5 degrees and -0.25 degrees. A small deviation within this range will not affect functionality.

2.4 Connecting CCR Cables

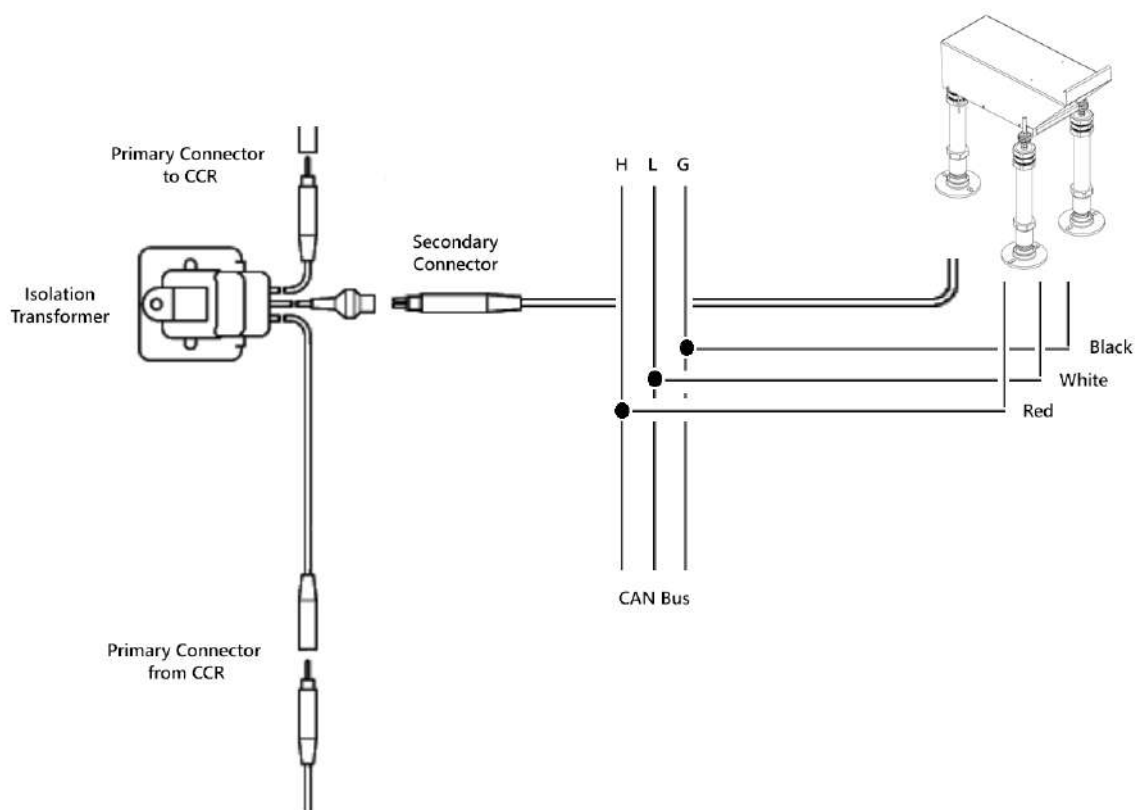


Figure 9. CCR Connection Diagram

STEP	ACTION
1	Use flexible conduit to protect wires exiting LHA from environmental interference; receptacle for conduit has been incorporated into the bottom of the LHA for ease of use and access.
2	Install isolation transformer in base can.
3	Connect primary cables.
4	Connect the secondary cable coming from the isolation transformer to the PAPI.

3. Maintenance

Disconnect all power to equipment before removing from service. All maintenance should be performed by qualified personnel familiar with Airfield Ground Lighting. Ideally, all maintenance tasks that require the Optical Housing or Electrical Enclosure to be opened should be performed in a clean, dry, dust free environment.

3.1 Cleaning the Light Head Assembly

When dust or dirt accumulates on the window at the front of the PAPI lenses, they should be cleaned to prevent interference with the intensity of the light output. Suggested cleaning includes:

CONDITION	CLEANING METHOD
Light Dust	Use a clean, soft cloth to gently brush the dust off the lens surface.
Excessive Dirt and Dust	Flush the lens surface with water prior to cleaning to avoid scratching the lens surface, then gently wipe dry with a clean, soft cloth.

3.2 Troubleshooting

PROBLEM	POSSIBLE CAUSES	SOLUTION
All LHAs turn on for 15-20 sec and turn off	Tilt switch fault – system is designed to shut off all LHAs when aiming angle has shifted beyond allowable limits	1. Remove the weather cover and the rear electronics enclosure cover. 2. Carefully power up the system. 3. The LED driver board will have a red LED that is either flashing or on steady. If flashing, the number of flashes indicates the LHA with a tilt fault. If on steady, indicates tilt fault on the current LHA. 4. Verify aiming angle per section 2.2.6, then reset the position of tilt switch.
	LED Fault – system is designed to shut off if one or more LED arrays is not functioning properly	1. Remove the weather cover and the rear electronics enclosure cover. 2. Check all cable connections. Most LED faults are caused by a faulty connection. 3. Carefully power up the system. 4. Verify that fault has been cleared. If not, replace LED driver board. 5. If still not cleared, replace LED cassette.

PROBLEM	POSSIBLE CAUSES	SOLUTION
LHA does not turn on	Bad converter board	1. Disconnect power from the system 2. Remove the weather cover and the rear electronics enclosure cover. 3. Replace the converter board.
One or more LHAs flashing	A mismatch between CCR and converter board	1. Call Avlite Customer Service.

3.3 Replacing Light Head Assembly Components

Refer to the following illustration for the procedures in this section. Note that some sectional views have been used to identify specific areas for details needed at that step.

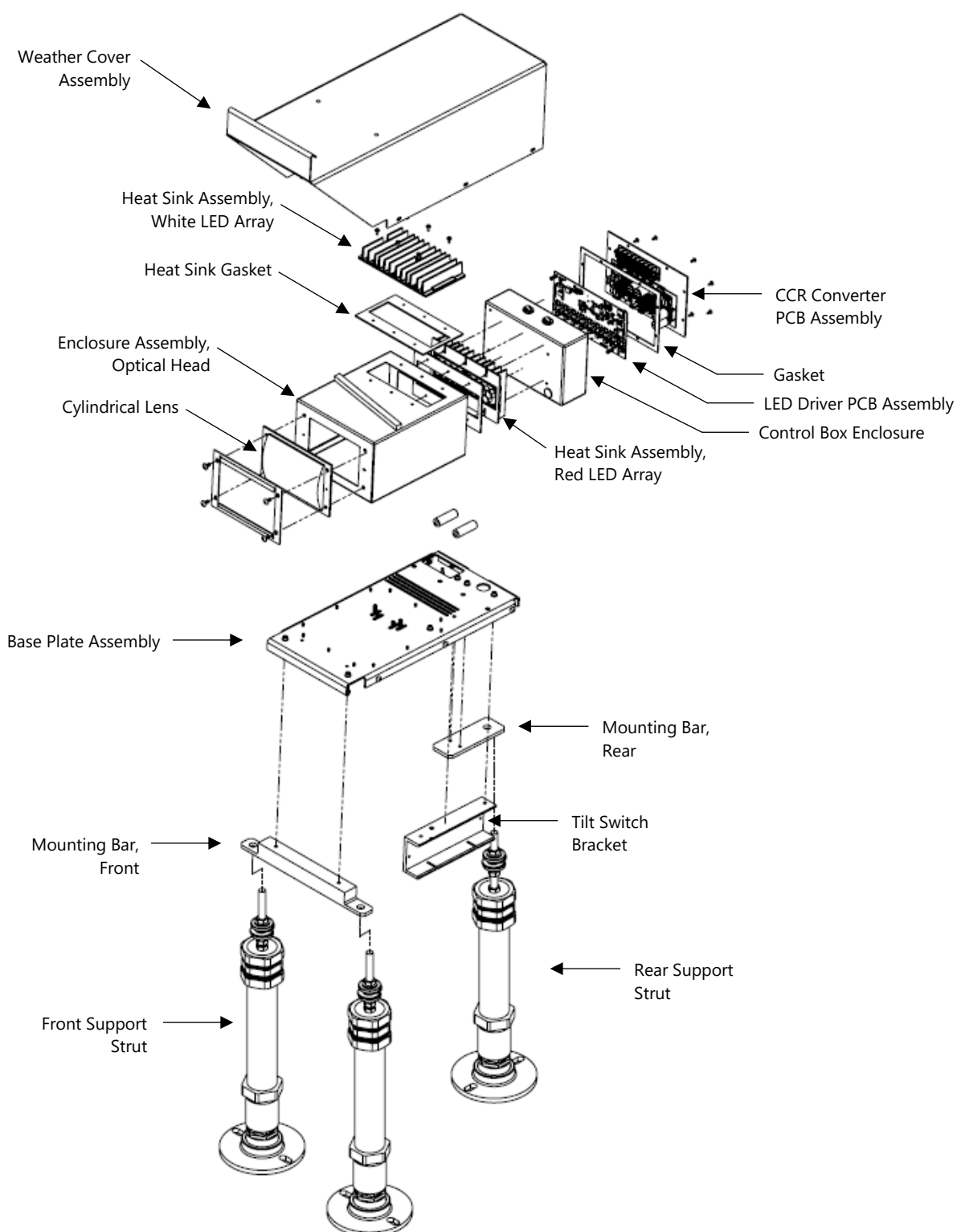


Figure 10. Exploded View of Light Head Assembly and Mounting Stand

3.4 Replacing the LHA Driver Board

The LED driver board is serviced as a complete assembly. When ordering a replacement, please provide the complete AV-PAPI system part number with options codes and serial number so that the correct firmware can be installed before dispatch.

STEP	ACTION
1	Ensure there is no power supply to the LHA.
2	Disconnect the LHA cable.
3	Remove the LHA weather cover.
4	Remove the rear cover of the electronics enclosure.
5	With a ¼-inch wrench, remove the four (4) nylon insert locknuts that hold the PCB to the stand-offs.
6	Store the four (4) locknuts in a clean, dry place.
7	Mark the Molex connectors to indicate the location and orientation relative to the PCB.
8	Carefully lift the circuit board and remove the Molex connectors from the PCB.
9	Obtain a replacement LHA power control board from Avlite.
10	Insert the Molex connectors in the same location and orientation on the PCB. NOTE: The red and white LED arrays use the same connectors. The red LED array on the rear of the optical housing should be plugged into the connector marked LED 1 (J6). The white LED array on the top of the optical housing should be plugged into the connector marked LED 2 (J5).
11	Verify that the Molex connectors are fully engaged to the PCB.
12	Carefully install the PCB onto the stand-offs and secure the PCB to the standoffs with the four (4) nylon insert locknuts.
13	Re-install the electronics enclosure cover.
14	Re-install the weather cover.

3.5 Replacing the Converter Board

The converter board is serviced as a complete assembly.

STEP	ACTION
1	Ensure there is no power supply to the LHA.
2	Disconnect the LHA cable.
3	Remove the LHA weather cover.
4	Remove the rear cover of the electronics enclosure.
5	With a ¼-inch wrench, remove the four (4) nylon insert locknuts that hold the PCB to the rear cover of the electronics enclosure.

6	Store the four (4) locknuts in a clean, dry place.
7	Mark the connectors to indicate the location and orientation relative to the PCB.
8	Carefully lift the circuit board and remove the connectors from the PCB. Be sure not to disturb the heat transfer material under the converter board.
9	Obtain a replacement converter board from Avlite.
10	Insert the Molex connectors in the same location and orientation on the PCB.
11	Verify that the Molex connectors are fully engaged to the PCB.
12	Carefully install the PCB onto the stand-offs and secure the PCB to the standoffs with the four (4) nylon insert locknuts.
13	Re-install the rear cover of the electronics enclosure.
14	Re-install the weather cover.

3.6 Replacing the Red or White LED Arrays

STEP	ACTION												
1	Ensure there is no power supply to the LHA.												
2	Disconnect the LHA cable.												
3	Remove the LHA weather cover												
4	Use the table below for the LED array/heatsink assembly that is being replaced. The red LED array is on the rear of the optical enclosure. The white LED array is on the top of the optical enclosure. <table data-bbox="451 1134 1263 1566"> <tr> <th>STEP</th><th>REPLACING THE RED OR WHITE LED ARRAY</th></tr> <tr> <td>A</td><td>Gently remove the two small wiring harnesses labeled P1 and P2 from the back of the heatsink</td></tr> <tr> <td>B</td><td>Remove the six (6) panhead screws holding the LED array/heatsink assembly onto the back of the optical head enclosure using a #1 Philips screwdriver</td></tr> <tr> <td>C</td><td>Gently remove the LED array/heatsink assembly from the gasket attached to the enclosure.</td></tr> <tr> <td>D</td><td>Seat the new LED array/heatsink assembly flush against the gasket and replace the six (6) screws.</td></tr> <tr> <td>E</td><td>Connect both P1 and P2 wiring harnesses on the new LED/heatsink assembly</td></tr> </table>	STEP	REPLACING THE RED OR WHITE LED ARRAY	A	Gently remove the two small wiring harnesses labeled P1 and P2 from the back of the heatsink	B	Remove the six (6) panhead screws holding the LED array/heatsink assembly onto the back of the optical head enclosure using a #1 Philips screwdriver	C	Gently remove the LED array/heatsink assembly from the gasket attached to the enclosure.	D	Seat the new LED array/heatsink assembly flush against the gasket and replace the six (6) screws.	E	Connect both P1 and P2 wiring harnesses on the new LED/heatsink assembly
STEP	REPLACING THE RED OR WHITE LED ARRAY												
A	Gently remove the two small wiring harnesses labeled P1 and P2 from the back of the heatsink												
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C	Gently remove the LED array/heatsink assembly from the gasket attached to the enclosure.												
D	Seat the new LED array/heatsink assembly flush against the gasket and replace the six (6) screws.												
E	Connect both P1 and P2 wiring harnesses on the new LED/heatsink assembly												
5	Re-install the LHA weather cover.												

4. PAPI Technical Information — Specifications

PRECISION APPROACH PATH INDICATOR -- TECHNICAL INFORMATION	
	AC DC
Light Characteristics	
Light Source	LED
Available Colors	White/Red
Intensity Adjustments	3 or 5-step intensity
LED Life Expectancy (hours)	> 100,000
Electrical Characteristics	
Circuit Protection	Integrated
Operating Input Current Range	3 & 5 step 2.8A to 6.6A (200W isolation transformer per LHA)
Input Frequency	50/60 Hz
Operating Power	80W MAX per LHA
Temperature Range	-40 to 131°F / -40 to 55°C
Physical Characteristics	
Body Material	Painted Aluminum
Lens Material	Optical Glass
Mounting	Permanent
Height (inches/mm)	Supplied 30.42 / 773
Length (inches/mm)	17.38 / 441
Width (inches/mm)	28.59 / 726
Mass (lb/kg)	17.8 / 8.07
Service Life	Up to 12 years
Environmental Standards	
Temperature - Operational	-31 to 131 °F / -35 to 55 °C
Temperature - Storage	-67 to 176 °F / -55 to 80 °C
Wind Speed	100 mph / 161 kph
Ingress	IP65
Compliance	
FAA	L-880 (4 LHA) and L-881 (2 LHA) AC 150/5345-28H Certified Style B Class I
ICAO	Annex 14 Part 1 PAPI (2 & 4 LHA) & APAPI (2 LHA) Compliant
UFC	3-535-01 (4 LHA) Compliant
DGAC	Pending
CE	EN61000-6-4:2012, EN61000-6-2:2019
Quality Assurance	ISO 9001:2015
Trademarks	AVLITE® and AV-HMALS® are a registered trademark of Avlite Systems
Patents	U.S. Patent No. US 9,863,601 B2
Other	
Available Options	Tilt Switch Heated Lens Fault Monitoring
Terms and Conditions	Warranty Terms and Conditions available at www.avlite.com .

5. Addendum 1 – Tilt Switch

As of October 2021, Avlite offers an optional MEMS tilt switch that is mercury-free.



Adjustment and operation of the MEMS tilt switch is similar to the previous tilt switch described in section 2.3 Adjustment of Excessive Tilt Mechanism.

6. Addendum 2 – Fault Monitoring Relay

The fault-monitoring relay option comprises the addition of a relay in the electronics control box that is normally closed when the PAPI LHA is powered up, but opens if there is a fault. It is equipped with a second cable connectorized for the secondary of another isolation transformer for remote monitoring of faults.

The relay opens in the event of a tilt switch fault or LED fault. Additionally, if the CCR converter board fails to provide power to the LHA for any reason, the relay will be open.

Notes



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