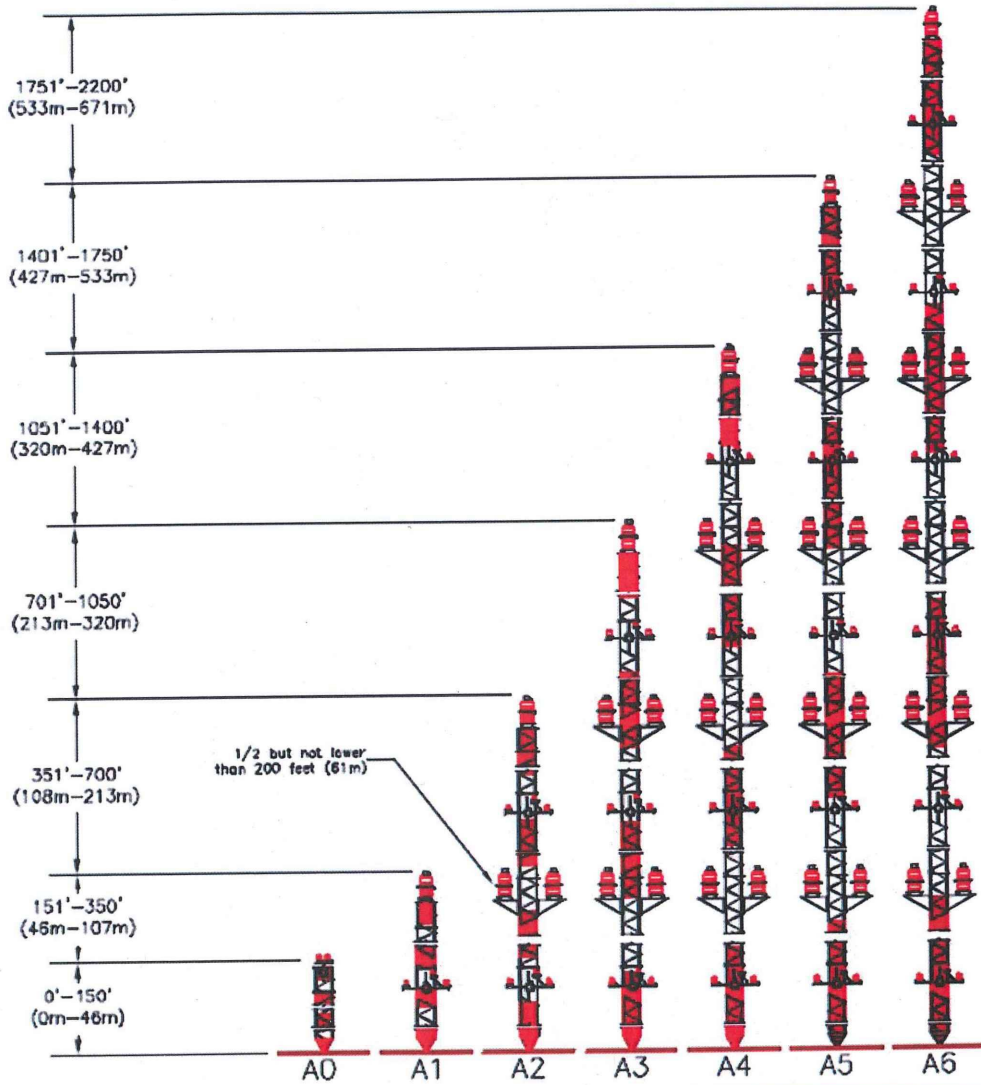




# RED OBSTRUCTION LIGHTING STANDARDS (FAA Style A)

Day Protection = Aviation Orange/White Paint  
Night Protection = 2,000cd Red Beacon and sidelights





-  - L-864 Flashing Beacon
-  - L-810 Obstruction Light

FIG 13

**APPENDIX 1: Specifications for Obstruction Lighting Equipment Classification****APPENDIX**

Type	Description
L-810	Steady-burning Red Obstruction Light
L-856	High Intensity Flashing White Obstruction Light (40 FPM)
L-857	High Intensity Flashing White Obstruction Light (60 FPM)
L-864	Flashing Red Obstruction Light (20-40 FPM)
L-865	Medium Intensity Flashing White Obstruction Light (40-FPM)
L-866	Medium Intensity Flashing White Obstruction Light (60-FPM)
L-864/L-865	Dual: Flashing Red Obstruction Light (20-40 FPM) and Medium Intensity Flashing White Obstruction Light (40 FPM)
L-885	Red Catenary 60 FPM
FPM = Flashes Per Minute	

TBL 4



Vigilant® LED Based Obstruction Lights

## Index

- 02 Vigilant® LED Based L-856/L-864 High Intensity (White/Red) Strobe
- 03 Vigilant® LED Based L-865/L-864 Medium Intensity (White/Red) Strobe
- 04 Vigilant® LED Based L-864 Medium Intensity (Red or Red + IR) Beacon
- 05 Vigilant® LED Based L-864 Medium Intensity (Red) GPS Beacon
- 06 Vigilant® LED Based L-810 Low Intensity (Red or Red + IR) RTO Side Light
- 07 Vigilant® LED Based L-810 Low Intensity (Red) Side Light

## About Dialight

As the leader in the LED lighting revolution, Dialight (LSE: DIA.L) continues to innovate light output, efficiency and reliability in their complete line of obstruction lighting fixtures specifically designed for industrial, hazardous, transportation and infrastructure applications. These results are directly due to the company's ongoing 40-year commitment to the advancement of LED lighting solutions that vastly reduce maintenance, improve safety, ease disposal and decrease CO<sub>2</sub> emissions.

## Features & Benefits

- 5 year full performance warranty
- Resistant to shock and vibration
- High impact polycarbonate lens with UV, scratch and chemical resistant coating
- Reduction in tower climbs for lower maintenance costs/unplanned site visits
- Smallest flash head in the Industry
- Community friendly lighting system utilizing patented optics

## Vigilant®

- LED lighting for obstruction applications

## SafeSite®

- LED lighting for hazardous locations

## Typical Applications

### Regulated Primary Markets

- Telecom
- Broadcast
- Chimneys
- Smoke Stacks
- Turbines
- Wire Crossings
- Tall Structures
- Obstruction Areas
- Marine
- Utilities

## Dialight Timeline

- 1999 → First ever FAA certified LED L810
- 2001 → First ever FAA certified LED L864
- 2007 → First ever FAA certified LED L865/L864
- 2011 → First ever FAA certified LED L856
- 2012 → First ever FAA certified LED L856/L864

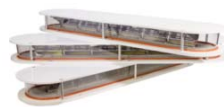
## Dialight's LED Technology Innovations Over the Years

First ever FAA certified LED obstruction light

Vigilant® LED Based High Intensity Strobe



2011 - (White)



2013 - (White/Red)

Vigilant® LED Based L-810 Red LED Obstruction Lights



1999



2007

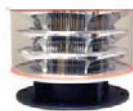
Vigilant® LED Based L-865/L-864 Flashing Dual (White/Red) Strobe



2007



2008



2009



2012



2013

Vigilant® LED Based L-864 Red Beacon



2001



2004



2006



2013

## View Dialight Case Studies at:

PPL Generation : [http://www.dialight.com/Assets/Brochures\\_And\\_Catalogs/Signaling/MDEXMMCMX001.pdf](http://www.dialight.com/Assets/Brochures_And_Catalogs/Signaling/MDEXMMCMX001.pdf)

PPL Power Generation: [http://www.dialight.com/Assets/Brochures\\_And\\_Catalogs/Signaling/PPL\\_Case\\_Study.pdf](http://www.dialight.com/Assets/Brochures_And_Catalogs/Signaling/PPL_Case_Study.pdf)

Century: [http://www.dialight.com/Assets/Brochures\\_And\\_Catalogs/Signaling/MDTFCTRAX001.pdf](http://www.dialight.com/Assets/Brochures_And_Catalogs/Signaling/MDTFCTRAX001.pdf)



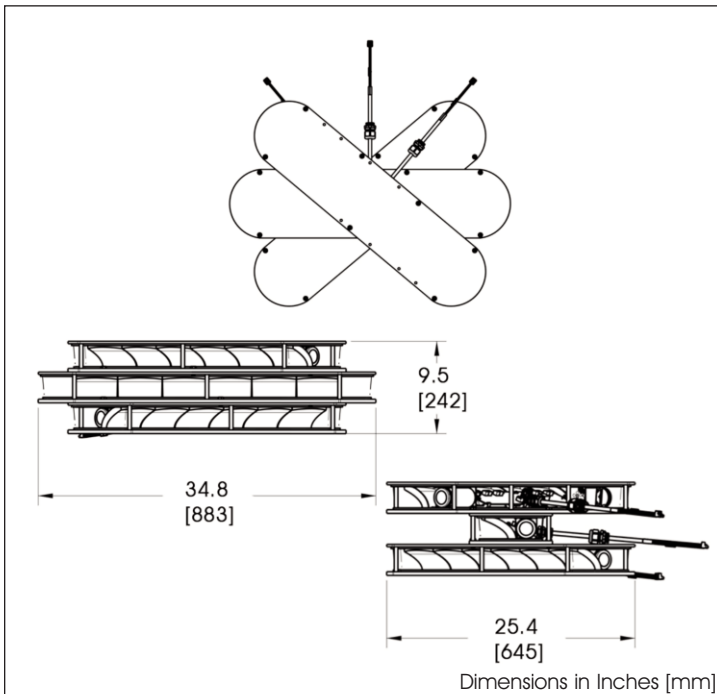
US Patent #7,281,821 (other patents pending)

## Vigilant® LED Based L-856 / L-864 High Intensity (White / Red) Strobe

### Application:

The Dialight Vigilant® High Intensity White / Red Strobe is the first all LED L-856 / L-864 units designed for the lighting of communication towers, chimney's, smoke stacks, broadcast towers and other tall obstructions to aerial navigation, as specified by the FAA. A high intensity system consists of 3 flash heads, 3 power supplies per level and 1 controller for the entire system. The flash heads will be placed on up to six levels of the structure for a maximum of 18 synchronized flash heads for a single tower. The 3 flash heads per level will provide 360 degrees of coverage.

Unlike conventional Xenon flashtube technology, Dialight's LED system provide years of maintenance free service, drastically reducing costs associated with tower climbs. Working voltages of less than 200V DC are significantly less than those of Xenon flashtube designs and use of LED technology also provides a more shock and vibration resistant design ensure consistent flash intensity every time.



Flash head Weight:	63 lbs (30 kg)
Operating Voltage:	208 - 277V AC 50/60Hz
Effective Intensity:	White Day 270,000 cd White Twilight 20,000 cd White Night 2,000 cd Red 2,000 cd
Wattage:	White Day 220W White Twilight 40W White Night 30W Red Night 30W
Power Factor:	>0.9
Ambient Temp:	-40°F to +131°F (-40°C to +55°C)
Synchronization:	Multiple units sync from single controller

### Certifications & Ratings

- FAA AC 150/5345-43G
- IP 66

### Qualified By

- Intertek ETL

### Compliant To

- Transport Canada CAR 621.19
- ICAO Annex 14
- DGAC Mexico

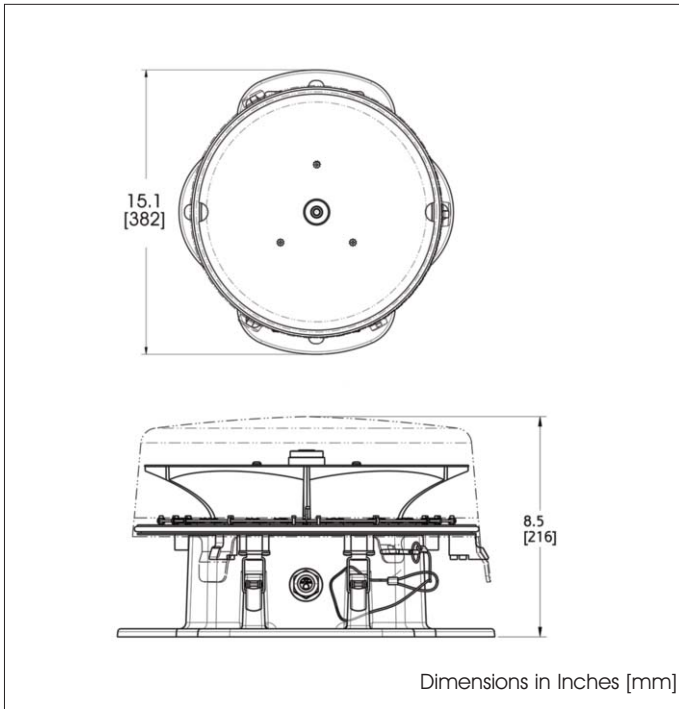


Part Number	Description	Voltage	Certification / Compliance
D266-A57-270	Flash Head and Power Supply	208-277V AC	FAA (TC) L-864 / L-856
D266-A57-CTR	Base Controller with Display (for use with DC side markers)	208-277V AC	FAA (TC) L-864 / L-856
D266-A57-CTRAC	Base Controller with Display (for use with AC side markers)	208-277V AC	FAA (TC) L-864 / L-856
D256-6000-PEC	Twilight / Night Photocell with Enclosure and 3/4 inch Conduit Entry		FAA (TC) L-864 / L-856
D156-6001JBX	Level Junction Box		FAA (TC) L-864 / L-856
D1RW-C13-009	Antenna Obstruction Light (AOL) Flash Head and Power Supply - 8 Conductors	120-277V AC	FAA (TC) L-864 / L-865
D1RW-C13-009CVT	Antenna Obstruction Light (AOL) Flash Head and Power Supply - 4 Conductors	120-277V AC	FAA (TC) L-864 / L-865



US Patents #7,208,881 #7,568,821 #7,604,380 #7,777,424

## Vigilant® LED Based L-865 / L-864 Medium Intensity (White / Red) Strobe



### Certifications & Ratings

- FAA AC 150/5345-43G
- IP 66

### Qualified By

- Intertek ETL
- CSA



### Compliant To

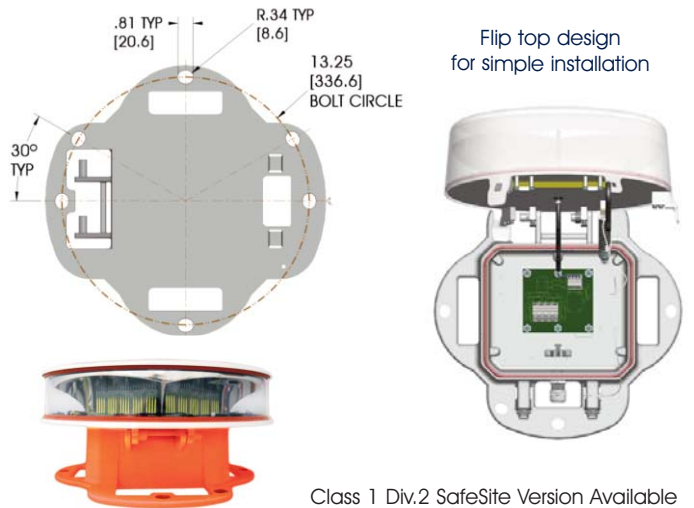
- Transport Canada CAR 621.19
- ICAO Annex 14
- DGAC Mexico

### Application:

The all LED Dialight Vigilant® medium intensity White / Red strobe is designed for the lighting of communication towers, chimneys, smoke stacks, wind generators and other obstructions to aerial navigation. The Dual L-865 / L-864 uses LED technology for light output from both the White / Red strobe.

Unlike conventional Xenon flashtube technology, provides years of maintenance free service. Working voltages of less than 200V DC are significantly less than those of Xenon flashtube designs, therefore, this system represents an advance in safety. The Dialight Dual L-865 / L-864 LED beacon operates from a 48V DC supply.

Flash Head Weight:	21 lbs (9.5 kg)
Operating Voltage:	120-277V AC 50/60Hz or 48 VDC power factor corrected supply (see below for options)
Supply Voltage Ranges:	Nominal +/- 10%
Effective Intensity:	White Day 20,000 cd White Night 2,000 cd Red Night 2,000 cd
Flash Head Power:	White Day 36W (System=75w) White Night 4W (System=10w) Red Night 12W (System=25w)
Power Factor:	>0.9
Operating Temp:	-40°F to +131°F (-40°C to +55°C)
Synchronization:	Multiple unit sync from single controller

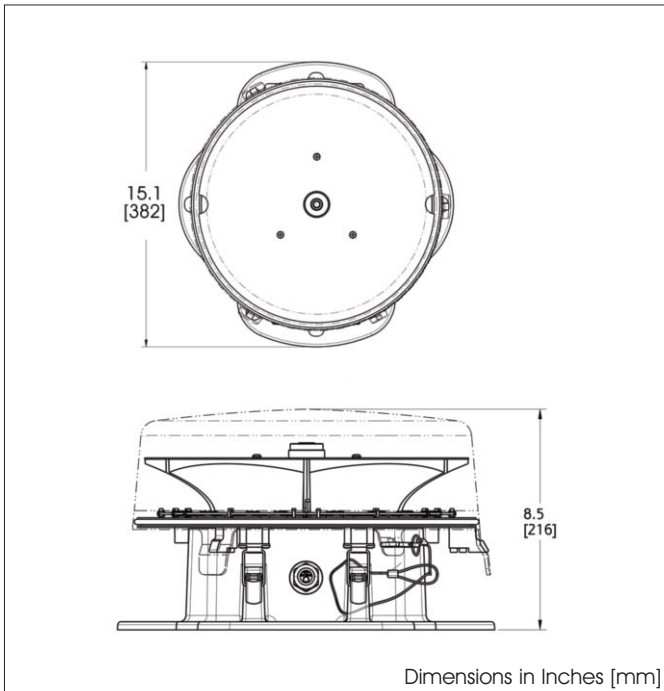


Part Number	Description	Voltage	Certification / Compliance
DIRW-C13-409SYS	Medium Intensity Dual (White/Red) AC system	120-277 VAC	FAA (TC) L-865/L-864
DIRW-C14-409SYS	Medium Intensity Dual (White/Red) DC system	48 VDC	FAA (TC) L-865/L-864



US Patents # 7,281,821 #7,568,821 (other patents pending)

## Vigilant® LED Based L-864 Medium Intensity (Red) Beacon Infrared (IR) version available



### Certifications & Ratings

- FAA AC 150/5345-43G
- IP 66

### Qualified By

- Intertek ETL
- CSA

### Compliant To

- Transport Canada CAR 621.19
- ICAO Annex 14
- DGAC Mexico

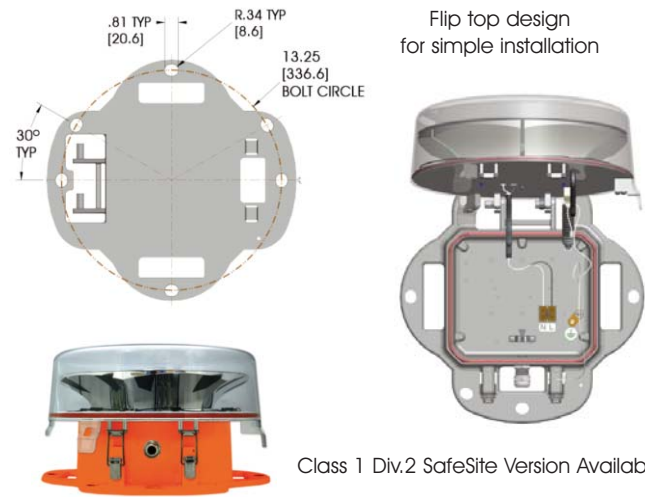
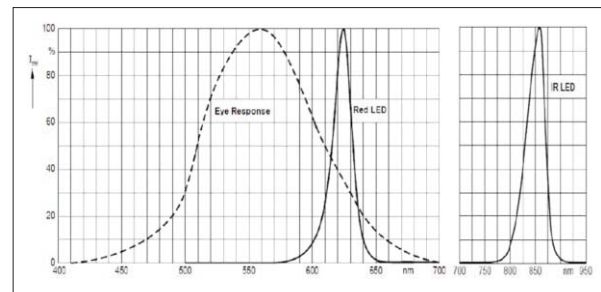


### Application:

The Dialight Vigilant® L-864 LED based medium intensity red beacon utilizes state-of-the-art optical design to achieve the most compact, efficient, FAA compliant L-864 medium intensity beacon in the market. While it readily interfaces into existing installations, its robust and low power design will provide years of maintenance free service.

The L-864 has extremely low RF interference and is ideal for the most difficult environments, including "hot" AM towers. Infrared (IR) versions are available for enhanced visibility when Night Vision Goggles (NVGs) are used.

Unit Weight:	18 lbs (8.18 kg)
Operating Voltage:	AC: 120-240V AC 50/60Hz power factor corrected supply DC: 24-48V DC +/-10%
Supply Voltage Ranges:	Nominal +/- 10%
Effective Intensity:	2,000 cd
Wattage:	3.3W (16.7% duty cycle)- standard 7.0 W (16.7% duty cycle)- IR version 20 flashes per min. with 0.5 sec. on time
Operating Temp:	-40°F to +131°F (-40°C to +55°C)
Power Factor:	>0.9



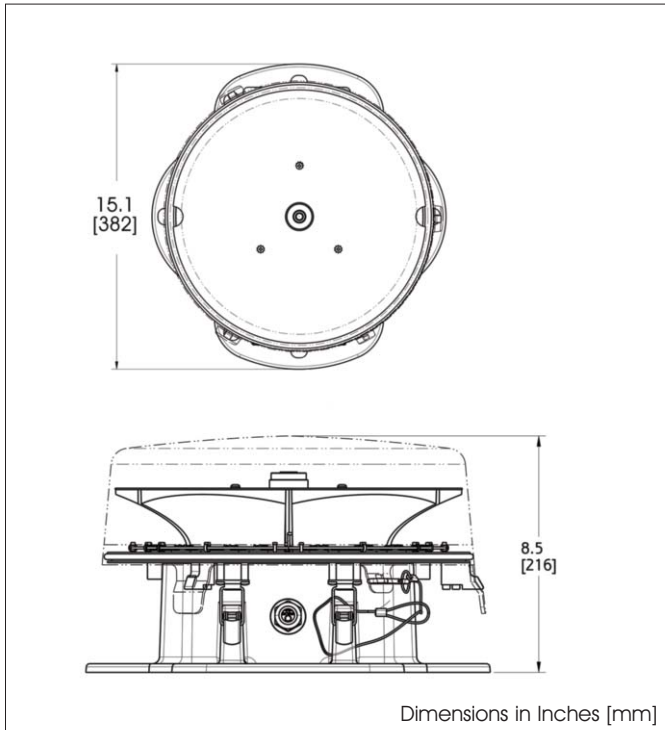
Part Number	Description	Voltage	Certification / Compliance
D564-A13-001	Flash Head	120-240V AC	FAA(TC) L-864
D564-C13-001-TC	Flash Head	120-240V AC	TC only L-864
D464-A54-001	Flash Head	24-48V DC	FAA (TC) L-864
D464-R13-001	Flash Head - Red + Infrared (IR)	120-240V AC	FAA (TC) L-864

Night Vision Goggles (NVG) and Aviator Night Vision Imaging Systems (ANVIS) sense infrared (IR) light at various wavelength ranges. Accordingly, Dialight makes no claim or representation that the IR light emitted by the Vigilant light is visible to any make or model of any NVG or ANVIS. In no event shall Dialight or any of its representatives be liable for any damages, including, without limitation, direct, consequential, indirect, punitive, incidental or special damages, in connection with the IR light emitted by the Vigilant light and/or whether any NVG or ANVIS can sense such IR light or whether the IR light emitted by the Vigilant light is visible to any NVG or ANVIS, regardless of the form of action.



US Patents # 7,281,821#7,568,821 (other patents pending)

## Vigilant® LED Based L-864 Medium Intensity (Red) GPS Beacon



### Certifications & Ratings

- FAA AC 150/5345-43G
- IP 66

### Qualified By

- Intertek ETL

### Compliant To:

- Transport Canada CAR 621.19
- ICAO Annex 14
- DGAC Mexico



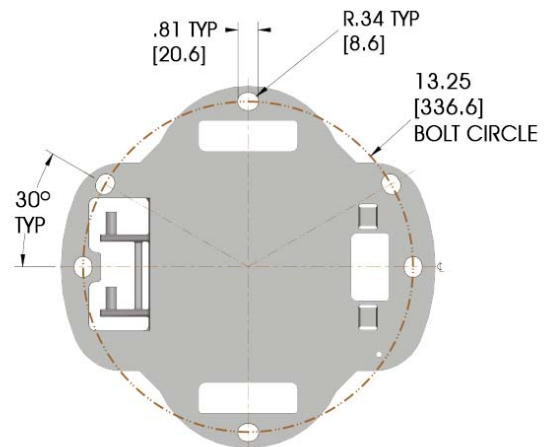
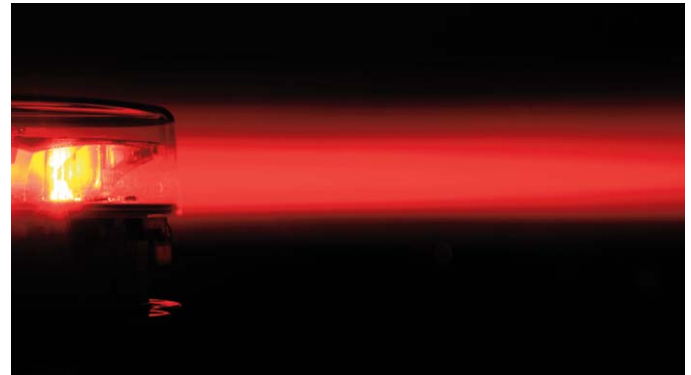
### Application:

The Vigilant® LED Based L-864 Medium Intensity Beacon with GPS technology, when utilized with multiple SFM's (Synchronized Flashing Modules), provides the synchronized flashing function (proper sequence of ON / OFF time) for multiple LED Beacons or LED obstruction lights. This product is ideal for wind farms, bridges, buildings, and other structures.

Unit Weight:	20 lbs (9 kg)
Operating Voltage:	120-240V AC, 50/60Hz; Switch Selectable
Flash Rate:	20, 30, or 40 (+/- 1%) flashes per minute (switch selectable); (½ ON and ½ OFF)
Effective Intensity:	2,000 cd
Wattage:	3.3W (16.7% duty cycle) 20 flashes per min. with 0.5 sec. on time
Power Factor:	>0.9
Operating Temp:	40°F to +131°F (-40°C to +55°C)

### Patented Optics

Minimum ground scatter for a "community-friendly" lighting system



Part Number	Description	Voltage	Certification / Compliance
D564-A13-001-GPS	Flash Head - Integrated GPS, Photocell, Monitoring	120-240V AC	FAA (TC) L-864

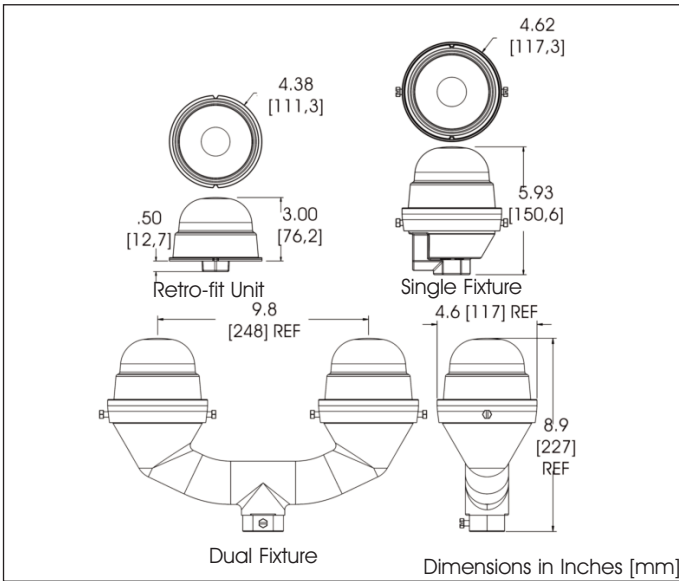




US Patent #7,604,384

## Vigilant® LED Based L-810

Low Intensity (Red) RTO Side Light  
Infrared (IR) versions available



### Application:

The Dialight Vigilant® RTO L-810 is the most universal, compact and efficient obstruction light in the world. ETL Certified to the FAA requirements, the RTO signal is also ICAO and Transport Canada compliant. A variety of mounting options are available, including a single signal for direct replacement of incandescent lamp/lens technology. Infrared (IR) versions are available for enhanced visibility when Night Vision Goggles (NVGs) are used.

Unit Weight:	1.25 lbs (0.56 kg) (Retro Unit) 2.00 lbs (0.91 kg) (Single Unit) 4.60 lbs (2.09 kg) (Dual Unit)
Supply Voltage Ranges:	Nominal +/- 10%
Input AC Frequency:	50/60Hz
Power Factor:	>0.9 (All AC units)
Operating Temp:	-40°F to +131°F (-40°C to +55°C)

### Certifications & Ratings

- FAA AC 150/5345-43G
- IP 66
- NEMA 4X

### Qualified By

- Intertek ETL
- Lighting Sciences Canada



### Compliant To

- Transport to Canada CAR 621.19
- ICAO Annex 14
- Nachrichten für Luffahrer Teil I Langen, 6. Januar 2005
- German Air Traffic Control Notices For Pilots Part I 6, January 2005
- DGAC Mexico

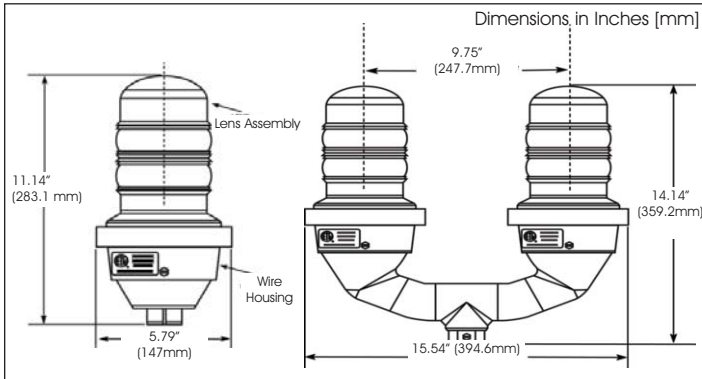
Part Number	Description	Voltage	Certification / Compliance	Wattage
RTO-1R06-001	Single Light	277V AC	FAA (TC) L-810	8.0
RTO-1R07-001	Single Light	120-240V AC	FAA (TC) L-810	6.5
RTO-1R08-001	Single Light	12-48V DC	FAA (TC) L-810	3.5
RTO-1R18-001	Single Light - Low Power	12-48V DC	FAA (TC) L-810	1.5
RTO-1R06-002	Dual Light	277V AC	FAA (TC) L-810	8.0
RTO-1R07-002	Dual Light	120-240V AC	FAA (TC) L-810	6.5
RTO-1R08-002	Dual Light	12-48V DC	FAA (TC) L-810	3.5
RTO-1R18-002	Dual Light - Low Power	12-48V DC	FAA (TC) L-810	1.5
RTO-1R06-004	Single Retro-fit Light	277V AC	FAA (TC) L-810	8.0
RTO-1R07-004	Single Retro-fit Light	120-240V AC	FAA (TC) L-810	6.5
RTO-1R08-004	Single Retro-fit Light	12-48V DC	FAA (TC) L-810	3.5
RTO-1R18-004	Single Retro-fit Light - Low Power	12-48V DC	FAA (TC) L-810	1.5
RTO-CR07-001	Single Light Red / Infrared (IR)	120-240V AC	FAA (TC) L-810	5.5
RTO-CR08-001	Single Light Red / Infrared (IR)	12-48V DC	FAA (TC) L-810	5.0
RTO-CR07-002	Dual Light Red / Infrared (IR)	120-240V AC	FAA (TC) L-810	5.5
RTO-CR08-002	Dual Light Red / Infrared (IR)	12-48V DC	FAA (TC) L-810	5.0
RTO-CR07-004	Single Retro-fit Light Red / Infrared (IR)	120-240 V AC	FAA (TC) L-810	5.5
RTO-CR08-004	Single Retro-fit Light Red / Infrared (IR)	12-48V DC	FAA (TC) L-810	5.0
RTO-1R07-001-EU	Single Light	120-240V AC	ICAO only, 32cd	6.5
RTO-1R07-002-EU	Dual Light	120-240V AC	ICAO only, 32cd	6.5
RTO-1R07-004-EU	Single Retro-fit Light	120-240V AC	ICAO only, 32cd	6.5
RTO-6CR7-001	Single Light Red / Infrared (IR)	120-240V AC	TC only L-810	9.0
RTO-6CR7-002	Dual Light Red / Infrared (IR)	120-240V AC	TC only L-810	9.0
RTO-6CR7-004	Single Retro-fit Light Red / Infrared (IR)	120-240V AC	TC only L-810	9.0

Night Vision Goggles (NVG) and Aviator Night Vision Imaging Systems (ANVIS) sense infrared (IR) light at various wavelength ranges. Accordingly, Dialight makes no claim or representation that the IR light emitted by the Vigilant light is visible to any make or model of any NVG or ANVIS. In no event shall Dialight or any of its representatives be liable for any damages, including, without limitation, direct, consequential, indirect, punitive, incidental or special damages, in connection with the IR light emitted by the Vigilant light and/or whether any NVG or ANVIS can sense such IR light or whether the IR light emitted by the Vigilant light is visible to any NVG or ANVIS, regardless of the form of action.



US Patent #6,425,678 (other patents pending)

## Vigilant® LED Based L-810 Low Intensity (Red) Light



### Certifications & Ratings

- FAA AC 150/5345-43G
- IP 66
- NEMA 4X

### Qualified By

- Intertek ETL
- Lighting Sciences Canada



### Compliant To

- Transport Canada CAR 621.19
- ICAO Annex 14
- Nachrichten für Luffahrer Teil I Langen, 6. Januar 2005
- German Air Traffic Control Notices For Pilots Part I 6, January 2005
- CASA
- DGAC Mexico

### Application:

The Dialight Vigilant® L-810 is a red LED side light. Designed for flashing or steady burn operation, this fixture is used to mark any obstacle that may present hazards to aircraft navigation.

<b>Unit Weight:</b>	7.14 lbs (3.23 kg) (Single Unit) 16.06 lbs (7.28 kg) (Dual Unit)
<b>Wattage:</b>	15W / 120mA (120V AC Units) (+/- 10%) 16W / 120mA (230V AC Units - 60 Hz) (+/- 15%) 16W / (230V AC Units - 50 Hz) 24W / 2.0A (12V DC Units - Standard) 20W / 920mA (24V DC Units) 13W / 275mA (48V DC Units)
<b>Voltage Amp:</b>	44 VA (120V AC Units) +-10% 67 VA (230V AC Units) +-15%
<b>Operating Temp:</b>	-67°F to +131°F (-55°C to +55°C)

Part Number	Description	Voltage	Certification / Compliance
860-1R01-001	Single Light	120V AC	FAA (TC) L-810
860-1R02-001	Single Light	230V AC	FAA (TC) L-810
860-1R03-001	Single Light	12V DC	FAA (TC) L-810
860-1R04-001	Single Light	48V DC	FAA (TC) L-810
860-1R05-001	Single Light	24V DC	FAA (TC) L-810
860-1R01-002	Dual Light	120V AC	FAA (TC) L-810
860-1R02-002	Dual Light	230V AC	FAA (TC) L-810
860-1R03-002	Dual Light	12V DC	FAA (TC) L-810
860-1R04-002	Dual Light	48V DC	FAA (TC) L-810
860-1R05-002	Dual Light	24V DC	FAA (TC) L-810
860-5R02-001	Single Light	230V AC	ICAO only, 10cd
860-5R02-002	Dual Light	230V AC	ICAO only, 10cd
860-4R02-001-EU	Single Light	230V AC	ICAO only, 50cd
860-4R02-002-EU	Dual Light	230V AC	ICAO only, 50cd
860-1R02-001-EU	Single Light	230V AC	ICAO only, 32cd
860-1R02-002-EU	Dual Light	230V AC	ICAO only, 32cd
860-6R01-001	Single Light	120V AC	TC only L-810
860-6R01-002	Dual Light	120V AC	TC only L-810
860-7R02-002	Dual Light	230V AC	CASA only, 100cd

All candela's are minimums  
See [www.dialight.com](http://www.dialight.com) for more information

## Dialight also offers these LED obstruction lights for use in Hazardous Locations (Class I, Div. 2)



SafeSite® L-810 Red LED  
Side Light



SafeSite® L-810 LED  
Steady Burn Visual Signals



SafeSite® FLS Flashing  
Visual Signals

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[http://www.dialight.com/Assets/Brochures\\_And\\_Catalogs/Illumination/Obstruction\\_Brochure.pdf](http://www.dialight.com/Assets/Brochures_And_Catalogs/Illumination/Obstruction_Brochure.pdf)

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