

DOCUMENT 1188

REVISION M

January 14, 2019



# Instruction Manual

*MIRL (Medium Intensity Runway Light)*  
*and*  
*MITL (Medium Intensity Taxiway Light),*  
*API Series*

Patent(s) Pending

Eaton Crouse-Hinds Series  
Airport Lighting Products  
1200 Kennedy Road  
Windsor, CT 06095

Copyright © 2019 Cooper Technologies Company

Instruction Manual  
MIRL and MITL,  
AP1 Series

Table of Contents

1	Revisions .....	iii
2	Product Warranty.....	v
3	Safety Notices.....	vi
3.1	Keep Away from Live Circuits .....	vi
3.2	RESUSCITATION .....	vi
4	Safety Symbols .....	vii
4.1	Danger.....	vii
4.2	Warning.....	vii
4.3	Caution.....	vii
4.4	Warning: Notice.....	vii
4.5	Warning : Important.....	vii
5	Recommended Test Equipment and Tools .....	viii
6	General Information .....	1
6.1	General Description – MIRL & MITL.....	1
6.2	Fixture Type/Color and Agency Compliance .....	2
6.3	Part Numbers: .....	6
7	Installation .....	11
8	Maintenance.....	14
8.1	General .....	14
8.2	Recommended Spares .....	14
8.3	Cleaning the Globe.....	14
8.4	Re-Leveling the Fixture .....	14
8.5	Replacing the Globe.....	16
8.6	Replacing the Frangible Coupling or Housing Column.....	16
8.7	Replacing the Arctic Kit (heater) .....	17
8.8	Replacing the Fixture Power Cord.....	18
8.9	Replacing the LED/Heat sink Assembly.....	19
8.10	Replacing the Power Supply .....	20
8.11	Resetting a MITL/MIRL Power Supply’s E-Prom .....	22

Instruction Manual  
MIRL and MITL,  
AP1 Series

**1 Revisions**

Rev. No.	Issue/Reissue Number Letter	Description	Checked	Approved
A	A215-042	Initial release	PG	2/27/15
B	A215-101	6.1, added L70 and except MITL international to 50,000 LED hours; Added 8.11; 8.10, added IMPORTANT WARNING; Table 7, added Green/Red, Green/Blank and Red/Blank TP312 MIRL Threshold and End wattages & Red/Blank J203 setting was Figure 6x; 6.2, 6.3 and Table 7, revised part numbering by removing or replacing any alpha characters X, I and O was other alpha characters, updating LED/Heat Sink replacement P/N/Figures for UFC and TP312E & deleted 312E-G/W & -G/Y; Added 10047-1677 to Table 5; Revised J200 on Figure 5A & B and added note to positions 13& 14; Deleted Figures 7K & 7L and 7K was 7M, 7L was 7N & 7M was 7P; Table 5, 10000-573 was 10A10-025D20	PG	3/30/15
C	A215-118	6.2 & Table 7, added “AP1” to Eaton part number in the correct sequential order	PG	4/15/15
D	A215-129	6.2 a., MIRL: L-861 (green/yellow globe) P/N 861B-AP1-GY-_-_-_-_- was 861-AP1-GR-_-_-_-_-; 6.1, added footnote (1) & 70% was “a given percentage	PG	4/23/15
E	A215-232	6.2. c, URL is for the 4 <sup>th</sup> Edition; table 5, 21616-1 was 50650; figure 2, added “-32 UNC” and “(NOT PRESENT ON INTERNAL CORD VERSIONS).” To external cord figure.	CS	08/12/15
F	A215-378	On table 5, the P/N for “LED TO POWER SUPPLY CABLE, SINGLE” was 50561-1; the part number for “LED TO POWER SUPPLY CABLE, DUAL” was 50561-2	CS	11/02/015
G	A216-030	Page vii, Deleted Fluke 87V; Page 34 & 35 Deleted “E” from end of TB312 on 50667-9,-10, -13,-14 description; Page 37, L-861E R/R was 50667-6/figure 7F, L-861E G/N was 50667-6/figure 7F, L-861SE G/R was 50667-6/figure 7F, L-861SE G/X was 50667-6/figure 7F, TP312 G/X was 50667-13/figure 7K, TP312 R/X was 50667-14/ figure 7L & TP 312 MIRL Header was TP312E MIRL.	MA	04/08/16
H	A216-152	Added crowfoot wrench, 1 inch socket and vise info to	PG	6/27/16

Instruction Manual  
MIRL and MITL,  
AP1 Series

		Section 5; Section 6.1, 30 minutes operation of Artic Kit was 15 minutes; Section 6, revised sequencing letters; 7.2 a., Section 6.2 was 8.2; 8.5, 8.7, 8.8, 8.9, 8.10, added instruction to discard desiccant capsule and recommendation to remove globe clamp in maintenance facility; 8.8, revised torque to 50 in-lbs from 40-45; Figure 6C, deleted un-jumpered pins 15 & 16		
J	A216-306	Page 18, Section 8.8, Revised extensively; Page 22, Section 8.11, J200 positions 1 & 2 was 13 & 14, Deleted “ as if power supply is non-heater version for reprogramming of e-prom.”; Page 23, Figure 3A, Deleted Jumper lead assembly & Hex nut; Page 24, Figure 3B, Deleted hex nut; Page 25, Table 5, Deleted POWER SUPPLY JUMPER LEAD ASSEMBLY, POWER SUPPLY FOR ARCTIC KIT was POWER SUPPLY & Description ‘1 per fixture with Arctic Kit’ was ‘1 per fixture’ , Added POWER SUPPLY WITHOUT ARCTIC KIT; Page 28, Figure 5A, Jumper positions 1 & 2 was 13 & 14, Deleted Jumper lead assembly; Page 29, Figure 5B, Jumper positions 1 & 2 was 13 & 14; 8.5, 8.7, 8.9 & 8.10, 1/32 to 1/16 was 1/8 & added 100 +/-2 in-lbs	IM	9/26/2017
K	A217-165	Page 1, Section 6.1, Added ‘ The fixture is supplied with an external found lug that accepts #4-14 AWG’ ; Page 6,7 & 8, Section 6.3, Table 1, 2 & 3, Removed ‘Ground’ from Arctic Kit Options 2 & 3; Page 9, 13, 23 & 24, Figure 1, 2, 3A & 3B, Updated for Grounding Lug; Page 25, Table 5, Removed 10000-567 & 10037-909, Added 10047-3141.	IM	8/3/2017
L	A217-253	Revised section 8.4 to add silicon grease information to CAUTION & WARNING statements, Updated 8.5, 8.7, 8.8, 8.9, Figure 3A & 3B, Table 5 & Figure 7N with regards to seal replacement data.	IM	11/21/17
M	A219-015	Updated Figure 1,2, 3A & 3B for O-Ring X-profile & Vent Screw; Table 5- O-RING, X-PROFILE P/N was 10033-120, added VENT P/N 10037-1024	IM	1/14/19

Instruction Manual  
MIRL and MITL,  
AP1 Series

**2 Product Warranty**

**Warranty**

Refer to Eaton's Crouse-Hinds Airport Lighting Products Terms and Conditions for product specific warranty information.

Instruction Manual  
MIRL and MITL,  
AP1 Series

### 3 Safety Notices

This equipment is normally used or connected to circuits that may employ voltages which are dangerous and may be fatal if accidentally contacted by operating or maintenance personnel. Extreme caution should be exercised when working with this equipment. While practical safety precautions have been incorporated in this equipment, the following rules must be strictly observed:

#### 3.1 Keep Away from Live Circuits

Operating and maintenance personnel must at all times observe all safety regulations. Do not perform maintenance on internal components or service with power ON.



**DANGER**

***DANGER:***

**DO NOT PERFORM MAINTENANCE ON INTERNAL  
COMPONENTS OR SERVICE WITH POWER ON.**

#### 3.2 RESUSCITATION

Maintenance personnel should familiarize themselves with the technique for resuscitation found in widely published manuals of first aid instruction.

Instruction Manual  
MIRL and MITL,  
AP1 Series

## 4 Safety Symbols

### 4.1 Danger



**DANGER**

***DANGER:***

**The hazard or unsafe practice will result in severe injury or death.**

### 4.2 Warning



**WARNING**

***WARNING:***

**The hazard or unsafe practice could result in severe injury or death.**

### 4.3 Caution



**CAUTION**

***CAUTION:***

**The hazard or unsafe practice could result in minor injury.**

### 4.4 Warning: Notice



**NOTICE**

***WARNING:***

**Possibly dangerous situation, goods might be damaged.**

### 4.5 Warning : Important



**IMPORTANT**

***WARNING:***

**Helpful information.**

Instruction Manual  
MIRL and MITL,  
AP1 Series

**5 Recommended Test Equipment and Tools**

There is a wide variety of tools and equipment needed to safely and correctly perform airfield lighting equipment installation and maintenance. In addition to the obvious tools (screwdrivers, wrenches, etc.), there is a specialized equipment needed to do the job.

**Multimeter**

One of the most important pieces of test equipment is the Multimeter. It is used to measure voltages, currents, and resistances. Almost every single maintenance task requires the use of a multimeter at one point or another. A quality meter in good repair and calibration is a must because airfield lighting power distribution equipment produces non-sinusoidal waveforms, traditional average reading meters are inaccurate and have very limited use. Checking or adjusting equipment based upon incorrect current reading may dramatically reduce lamp life and adversely affect power equipment performance. A meter with TRUE RMS measuring capability with a current clamp-on accessory is needed to accurately measure distorted or chopped waveforms. All meter manufacturers offer TRUE RMS measuring meters. The following is a short list of TRUE RMS Multimeters from Fluke:

Manufacturer	Model Number
Fluke	287

Our recommended multimeter is the Fluke 287 with the Fluke I800 current clamp accessory. Refer to the equipment manufacturer’s manuals for the proper use, maintenance and calibration (if necessary) of all meters.

A 3/8 inch square drive socket and ratchet, and an open end wrench, size 7/16 or 11 mm for the ¼-20 UNC fixture hex bolts.

A calibrated torque wrench (micrometer adjustable solid audible/tactile “click” impulse when torque value attained with an accuracy of +/- 4%) to fit a 7/16 or 11 mm socket for drive size of the socket to tighten the fixture hex bolts to 80 +/-5 in-lbs [9.04 +/- .565 Nm]. Torque wrenches: Sturtevant Richmond P/N 810751, range 30 to 150 in-lbs or equal, or Sturtevant Richmond P/N 810775, range 4 to 20 Nm or equal. Certificate of calibration included with suggested torque wrenches. Note, never loosen bolts with a torque wrench.

A 2 inch open end wrench, Proto 2 inch combination wrench P/N J1264 or equal, or channel locks capable of fitting a 2 inch [50.8 mm] hex, Irwin P/N 4935323 or equal.

A quality glass circular level with an outer diameter of .88 [22.3 mm] for leveling the fixture, if required. Crouse-hinds Airport Lighting P/N 10037-956 or equal. Our level has a sensitivity of 45 MIN/0.1” [2.54 mm]. The clear fluid has a temperature range of -40 degrees F [-40 degrees C] to +150 degrees F [65 degrees C].

Anti-seize (marine grade preferred, Henkel/Loctite P/N 34395 or 34026 or equal [ <http://www.henkelna.com/adhesives/product-search-1554.htm?nodeid=8797882515457>



Instruction Manual  
MIRL and MITL,  
AP1 Series

) with a K factor of 0.18 for **fully** coating the frangible coupling threads or base plate/stake hub threads. This will help facilitate removal of sheared frangible couplings or fixtures for replacement/maintenance. Only use an anti-seize, as other materials may wash away.



**IMPORTANT**

**WARNING:**

**Failure to apply anti-seize at installation will result in impossible/ to near impossible removal of a frangible coupling from a threaded hub over time.**

A strap wrench to accommodate a minimum diameter of 4.0 [101.6 mm] to help loosen or tighten the globe clamp. BOA Tool Corporation P/N 45535 (fits a .75 [19.05 mm] to 6.75 [171.45 mm] diameter) or equal. This may require the use of a bench mounted 4-1/2 inch opening vise (pad the jaws to prevent damage to housing exterior finish) to hold the housing while loosening the globe clamp.

A 2 inch striking wrench to help loosen stubborn sheared frangible couplings from a hub, Proto P/N J2632SW (12 point, offset) or equal. You will also need a weighted hammer for striking.

A 3/8 inch square drive socket and ratchet, and an open end wrench, size 9/16 or 14 mm for the fixture base plate 3/8-16 UNC hex bolts installed into a FAA L-867 base (24 inch [609.6 mm] depth).

A calibrated torque wrench (micrometer adjustable solid audible/tactile “click” impulse when torque value attained with an accuracy of +/- 4%) to fit a 9/16 or 14 mm socket for drive size of the socket to tighten the fixture base plate 3/8-16 UNC hex bolts to 225 in-lbs -0, +0% [25.42 -0, +10%] with an anti-seize that has a K factor of 0.18 applied to **fully** cover the bolt threads. Torque wrenches: Sturtevant Richmond P/N 810748, range 100 to 600 in-lbs or equal, or Sturtevant Richmond P/N 810782, range 10 to 50 Nm or equal. Certificate of calibration included with suggested torque wrenches. Note, never loosen bolts with a torque wrench.

A calibrated adjustable torque screwdriver to torque the external ground screw to 6 in-lbs [1.81Nm] minimum if the fixture is ordered with the option external power cord. Sturtevant Richmond P/N 810568 (comes with bits [hex, slotted, Torx, Phillips, sq. recess, bit holder, socket adapter], case and certificate of calibration), range 2 to 36 in-lbs/0.2 to 4 Nm or equal. Note, never loosen screws with a torque screwdriver.

Needle nose pliers for installing the extremely small header jumper onto a spare Power Supply J203 header when required, or removing the flag type fast-on terminals from the power supply. Xcelite P/N NN54-2 miniature pliers, fine needle nose, ESD-Safe or equal.

Instruction Manual  
MIRL and MITL,  
AP1 Series

A grounded ESD Wrist Strap when working on or handling fixture power supplies or LED/Heat sink assemblies. ESD Wrist Straps, also known as anti-static Wrist Straps, are used to prevent electrostatic discharge (ESD) by safely grounding a person working with electronic equipment or at an electronic assembly facility. It consists of a band of fabric with fine conductive fibers woven into it. The fibers are usually made of carbon-filled rubber, and the strap is bound with a stainless steel clasp or plate. They are usually used in conjunction with an ESD table mat on the workbench, or a special static-dissipating plastic laminate on the workbench. ESD Products brand ( [http://www.esdproduct.com/esd\\_wrist\\_straps.php](http://www.esdproduct.com/esd_wrist_straps.php) ) or equal.

A #2 x 4 inch (101.6 mm) long Phillips head screw driver for installing the Isolation Transformer's FAA L-823 Style 8 secondary receptacle retainer plate screws into one of the recommended base plates for a L-867 base.

A 1 inch 12 point Combination Wrench (open end will be used) for installing a fixture internal replacement power cord grip. Klein P/N 68422 or equal or a 12 point 1 inch flare nut crowfoot wrench, 3/8 drive (required to set power cord fitting torque), Martin Tool & Force P/N BC32 or equal.

A 1-1/16 inch 12 point Combination Wrench (open end will be used) for installing a fixture external replacement power cord grip. Klein P/N 68423 or equal or a 12 point 1-1/16 inch flare nut crowfoot wrench, 3/8 drive (required to set power cord fitting torque), Martin Tool & Force P/N BC34 or equal.

A 1 inch 12 point socket, 3/8 drive for checking torque on a hole plug used on external cord fixtures where internal cord grip usually installs. Proto P/N J5232H or equal.

Most tools indicated above can be purchased from MSC Industrial Supply Co. ( <http://www.mscdirect.com/> ), or McMaster-Carr ( <http://www.mcmaster.com/> ).

Instruction Manual  
MIRL and MITL,  
AP1 Series

## 6 General Information

### 6.1 General Description – MIRL & MITL

Crouse-Hinds Airport Lighting Products, **MIRL** (Medium Intensity Runway Light) is an elevated cast aluminum housing/globe retainer and frangible coupling fixture that has the correct glass color dome and LED(s) installed for its intended use for runway edge and distance remaining indication (by dome/LED color) marking, or runway threshold, or displaced runway threshold marking and distance remaining indication. The **MITL** (Medium Intensity Taxiway Light) is an elevated cast aluminum housing/globe retainer and frangible coupling blue glass color dome internally illuminated fixture to provide pavement edge marking on airfield taxiways. The glass color dome indicates the correct color for day time non-illuminated identification to the specification. When illuminated, the colored glass dome with the correct LED(s) and power supply setting will produce the photometrics and chromaticity to meet specifications. The LED and electronics are housed in a IP67 compliant assembly per IEC 60529 (latest). The fixture and all components are EU RoHs compliant except the 1.75 inches (44.45 mm) tubing outer diameter column. The LED “API” power supply can be used with either a 3 (4.8, 5.5, 6.6A output) or 5 step (2.8, 3.4, 4.1, 5.2, 6.6A output) Constant Current Regulator (CCR), 50 or 60 Hz. The power supply has a power factor of 0.99 in all steps, and efficiency greater than 80% at 6.6A. The power supply is compatible with all known CCR types, has a 3.5 Crest factor to ensure compatibility with Series CCRs, has a 0.88 second switch-on time, a typical initial turn on voltage of 1.5V, high frequency 400 Hz PWM to help eliminate flicker perception, and a 10k/5kA surge protection. The LED(s) have a projected life of greater than L70 (L70 = elapsed operating time in hours over which the LED light source maintains 70% of its initial output) @ 50,000 hours at 6.6A(1). If an Arctic Kit is ordered with the fixture, it will comply with the requirements of FAA EB67 (latest), which will raise the outside surface temperature 15 degree C (59 degrees F) after 30 minutes of operation at the CCR high step of 6.6A. The arctic kit heating filament is applied directly to the glass dome interior and does not obstruct the photometric output. The leveling adjustment bolts are type 18-8 hex heads which fit a standard socket/wrench size. The frangible coupling installation/removal hex fits a standard wrench size. The frangible coupling has an integral fluid barrier to prevent ambient precipitation from entering the base. The fixture can be leveled with a commercially available circular level (see Section 5). All fixture exterior parts are yellow (FED-STD-595 color 13538). All fixtures are factory illuminated a minimum of 4 hours and meet the FAA requirements for EMI (electromagnetic interference) suppression. The standard fixture height is less than 350 mm (13.78 inches) from grade when installed on the base plates or stake mounts shown in this manual. The standard height fixture weighs approximately 3.8 pounds (1.68 Kg). The fixture is available in other various heights and with multiple frangible coupling thread sizes. The fixture is equipped with an external grounding lug that accepts #4-14 AWG. It is also available with an optional external power cord and ground for non-FAA versions. The fixture requires a minimum 6.6A/6.6A, 10/15 Watt Series Isolation Transformer without the arctic (heater) kit (minimum 20/25 watt or 30/45 watt with the arctic kit [version dependent]).

(1) 861T-AP1-BC, 861B-AP1-GY (yellow only), 312E-AP1-GN, 312E-AP1-GR (green only) L70 status undetermined due to insufficient data.

Instruction Manual  
MIRL and MITL,  
AP1 Series

**6.2 Fixture Type/Color and Agency Compliance**

**a. U.S. DOT FAA** (<http://www.faa.gov/> )

See part number breakdown in Table 1 for MITL and Table 2 for MIRL

The following fixtures are approved to U.S. Department of Transportation Federal Aviation Administration (FAA) Advisory Circular (AC) AC 150/5345-46 (latest) and also meet FAA Engineering Brief (EB) EB67 (latest):

**Taxiway:**

**MITL:** L-861T (blue globe) , P/N 861T-AP1-BA- \_ \_ \_ \_ \_ \_ \_ \_

**Runway:**

**MIRL:** L-861 (white globe), P/N 861M-AP1-WM- \_ \_ \_ \_ \_ \_ \_ \_

**MIRL:** L-861 (yellow globe), P/N 861M-AP1-YM- \_ \_ \_ \_ \_ \_ \_ \_

**MIRL:** L-861 (white/yellow globe), P/N 861B-AP1-WY- \_ \_ \_ \_ \_ \_ \_ \_

**MIRL:** L-861 (white/red globe), P/N 861B-AP1-WR- \_ \_ \_ \_ \_ \_ \_ \_

**MIRL:** L-861 (yellow/red globe), P/N 861B-AP1-YR- \_ \_ \_ \_ \_ \_ \_ \_

**MIRL:** L-861 (green/yellow globe), P/N 861B-AP1-GY- \_ \_ \_ \_ \_ \_ \_ \_

**Threshold:**

**MIRL:** L-861E (red/green globe), P/N 861E-AP1-RG- \_ \_ \_ \_ \_ \_ \_ \_

**MIRL:** L-861E (red/red globe), P/N 861E-AP1-RR- \_ \_ \_ \_ \_ \_ \_ \_

**MIRL:** L-861E (green/blank globe), P/N 861E-AP1-GN- \_ \_ \_ \_ \_ \_ \_ \_

**MIRL:** L-861SE (red/green globe), P/N 861S-AP1-RG- \_ \_ \_ \_ \_ \_ \_ \_

**MIRL:** L-861SE (green/blank globe), P/N 861S-AP1-GN- \_ \_ \_ \_ \_ \_ \_ \_

Note; for runways with either a Precision Approach Path Indicator (PAPI), runway end identifier lights (REIL), medium intensity approach light system (MALS), or lead-in lighting system (LDIN), L-861E light fixture may be installed in lieu of the L-861SE. An L-861SE light fixture should be used for MIRL if there is no PAPI, REIL, MALS or LDIN present.

FAA MIRLs are used on visual runways or non-precision runways.

Refer to FAA AC 150/5340-30 (latest) for design and installation details for airport visual aids and spacing.

**b. U.S. DOD UFC** ([http://everyspec.com/DoD/DoD-UFC/ufc\\_3\\_535\\_01\\_6469/](http://everyspec.com/DoD/DoD-UFC/ufc_3_535_01_6469/) )

See part number breakdown in Table 1 for MITL and Table 2 for MIRL

The following fixtures meet U.S. Department of Defense Unified Facilities Criteria (UFC) 3-535-01 (latest) for photometry, the mechanical requirements of FAA AC 150/5345-46 (latest),

Instruction Manual  
MIRL and MITL,  
AP1 Series

and requirements for light sources other than incandescent or xenon per FAA EB67 (latest), except MITL meets the chromaticity requirements of NATO STANAG 3316 (latest):

**Taxiway:**

**MITL:** UFC (blue globe) , P/N 861T-AP1-BC- \_ - \_ \_ - \_ - \_

**Runway:**

**MIRL:** UFC (white globe), P/N 861M-AP1-UW- \_ - \_ \_ - \_ - \_

**MIRL:** UFC (yellow globe), P/N 861M-AP1-UY- \_ - \_ \_ - \_ - \_

**MIRL:** UFC (white/yellow globe), P/N 861B-AP1-UF- \_ - \_ \_ - \_ - \_

Use MIRL UFC (yellow globe) ), P/N 861M-AP1-UY- \_ - \_ \_ - \_ - \_ fixtures for UFC Taxiway End fixtures.

Use MIRL L-861SE (red/green globes), P/N 861S-AP1-RG- \_ - \_ \_ - \_ - \_ for UFC Runway Threshold fixtures.

UFC MIRLs are used on VFR (visual flight rules) runways, or runways having a non-precision Instrument Flight Rule procedure, for either circling or straight-in approaches. MIRLs are not installed on runways intended for precision approaches.

Refer to UFC 3-535-01 (latest) for runway and taxiway lighting standards installation and spacing.

c. **Canada TP312** (<http://www.tc.gc.ca/eng/civilaviation/publications/tp312-menu-4765.htm>)

See part number breakdown in Table 1 for MITL and Table 3 for MIRL

The following fixtures meet the requirements of Canada Aerodromes Standards and Recommended Practices TP312 (latest):

**Taxiway:**

**MITL:** TP312 (blue globe) , P/N 861T-AP1-BC- \_ - \_ \_ - \_ - \_

**Runway:**

**MIRL:** TP312 (white globe), P/N 312M-AP1-WM- \_ - \_ \_ - \_ - \_

**MIRL:** TP312 (yellow globe), P/N 312M-AP1-YM- \_ - \_ \_ - \_ - \_

**MIRL:** TP312 (white/yellow globe), P/N 312B-AP1-WY- \_ - \_ \_ - \_ - \_

**MIRL:** TP312 (red/white), P/N 312B-AP1-RW- \_ - \_ \_ - \_ - \_

**MIRL:** TP312 (red/yellow globe), P/N 312B-AP1-RY- \_ - \_ \_ - \_ - \_

**Threshold:**

**MIRL:** TP312 (green/red globe), P/N 312E-AP1-GR- \_ - \_ \_ - \_ - \_

**Threshold/Wingbar:**

**MIRL:** TP312 (green/blank globe), P/N 312E-AP1-GN- \_ - \_ \_ - \_ - \_

**Runway End:**

**MIRL:** TP312 (red/blank globe), P/N 312E-AP1-RN- \_ - \_ \_ - \_ - \_

Instruction Manual  
MIRL and MITL,  
AP1 Series

Use MIRL TP312 (yellow globe), P/N 312M-AP1-YM- \_ - \_ \_ - \_ - \_ fixtures for TP312 Taxiway Apron Exit fixtures.

TP312E MIRLs are used on runways at night where it is a non- instrument runway or non-precision runway.

Refer to TP312E (latest) for runway and taxiway lighting standards installation and spacing.

- d. **ICAO Annex 14** (<http://store1.icao.int/index.php/publications/safety/aerodromes/annex-14-aerodromes-volume-i-aerodrome-design-and-operations-english-printed-10885.html> )  
(<http://store1.icao.int/index.php/publications/safety/aerodromes/aerodrome-design-manual-part-4-visual-aids-doc-9157p4-english-printed.html> )  
(<http://store1.icao.int/index.php/publications/safety/aerodromes/aerodrome-design-manual-part-6-frangibility-doc-9157p6-english-printed.html> )  
([http://webstore.iec.ch/webstore/webstore.nsf/Artnum\\_PK/32200](http://webstore.iec.ch/webstore/webstore.nsf/Artnum_PK/32200) )

See part number breakdown in Table 1 for MITL

The following fixture meets International Civil Aviation Organization (ICAO) Annex 14 Aerodromes Volume I Aerodromes Design and Operations (latest) for photometry and chromaticity, the frangible requirements of ICAO Document 9157 (AN/901) (latest) Aerodrome Design Part 6 for frangibility and the height restrictions (<350 mm) of the International Electrotechnical Commission (IEC) Technical Specification TS 61827 :

**Taxiway:**

**MITL:** ICAO (blue globe), P/N 861T-AP1-BC- \_ - \_ \_ - \_ - \_

Refer to ICAO Document 9157 (AN/901) (latest) Aerodrome Design Manual Part 4 Visual Aids for taxiway edge fixture spacing.

Note, ICAO does not have MIRLs.

- e. **NATO STANAG 3316** (<http://infostore.saiglobal.com/store/Details.aspx?productID=453168> )

See part number breakdown in Table 1 for MITL

The following fixture meets North Atlantic Treaty Organization (NATO) STANAG (latest) for photometry and NATO STANAG 3711 for chromaticity, the frangible requirements of ICAO Document 9157 (AN/901) (latest) Aerodrome Design Part 6 for frangibility and the height restrictions (<350 mm) of the International Electrotechnical Commission (IEC) Technical Specification TS 61827 :

**Taxiway:**

Instruction Manual  
MIRL and MITL,  
AP1 Series

**MITL:** NATO (blue globe), P/N 861T-AP1-BC- \_ - \_ \_ - \_ - \_

Refer to NATO STANAG 3316 (latest) for taxiway edge fixture spacing.

Note, NATO does not have MIRLs.

- f. **U.S. Navy NAVAIR** ([http://www.proconstructinc.com/jobs/TEAM-Paving/Air%20Field%20Taxiway%20Striping%20AFS13/TECH\\_MANUAL\\_100406.pdf](http://www.proconstructinc.com/jobs/TEAM-Paving/Air%20Field%20Taxiway%20Striping%20AFS13/TECH_MANUAL_100406.pdf) )  
See part number breakdown in Table 1 for MITL

The following fixtures meet U.S. Navy NAVAIR 51-50AAA-2 (latest) for photometry, the mechanical requirements of FAA AC 150/5345-46 (latest), and requirements for light sources other than incandescent or xenon per FAA EB67 (latest), except the MITL meets the chromaticity requirements of International Civil Aviation Organization (ICAO) Annex 14 Aerodromes Volume I Aerodromes Design and Operations (latest):

**Taxiway:**

**MITL:** NAVAIR (blue globe), P/N 861T-AP1-BC- \_ - \_ \_ - \_ - \_

Use MIRL TP312 (yellow globe), P/N 312M-AP1-YM- \_ - \_ \_ - \_ - \_ fixtures for NAVAIR Taxiway Termination fixtures.

Refer to NAVAIR 51-50AAA-2 (latest) for taxiway lighting standards spacing.

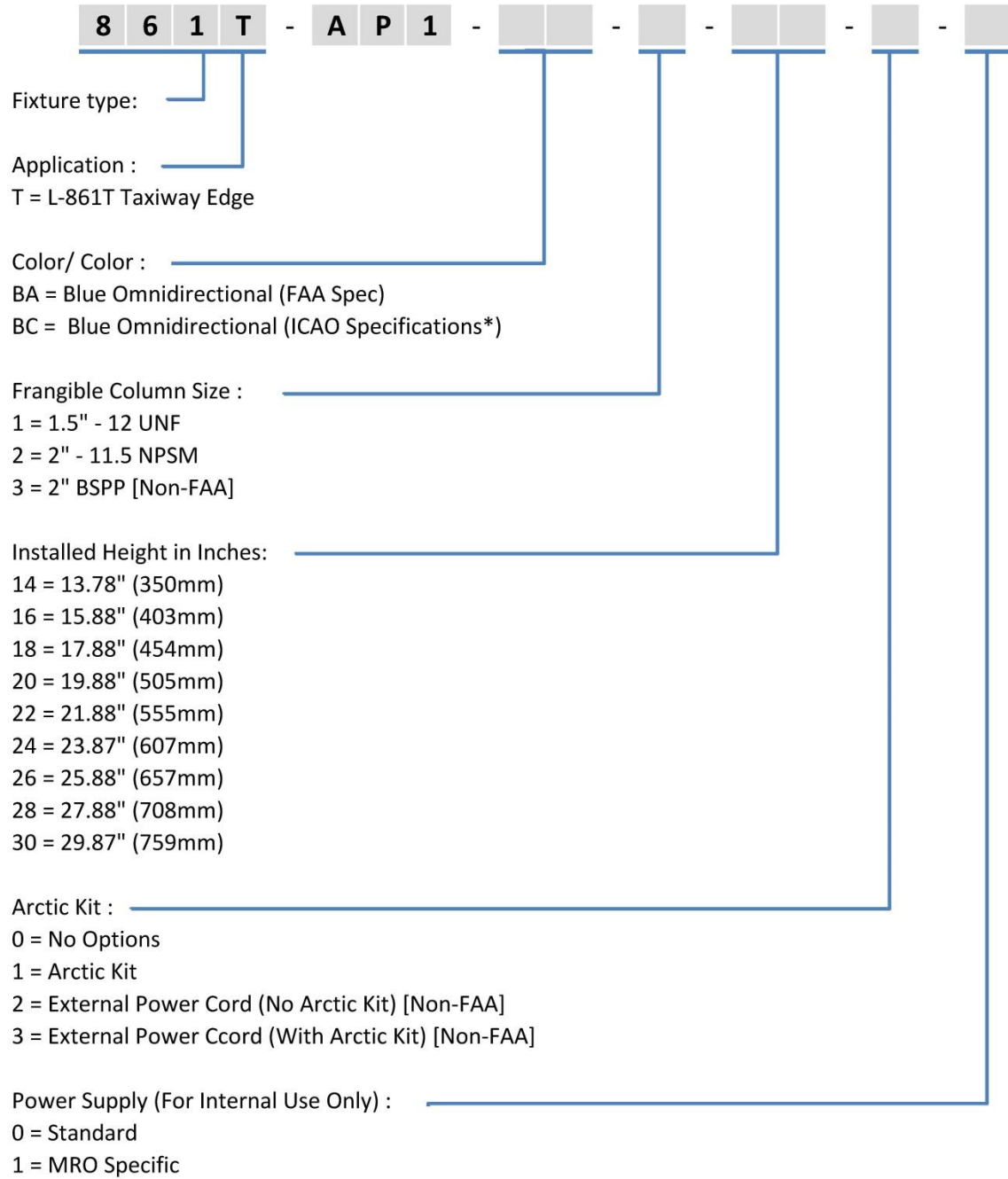
Refer to UFC 3-535-01 (latest) for taxiway lighting standards installation.

Note, NAVAIR does not have MIRLs.

Instruction Manual  
MIRL and MITL,  
AP1 Series

**6.3 Part Numbers:**

**Table 1, MITL**



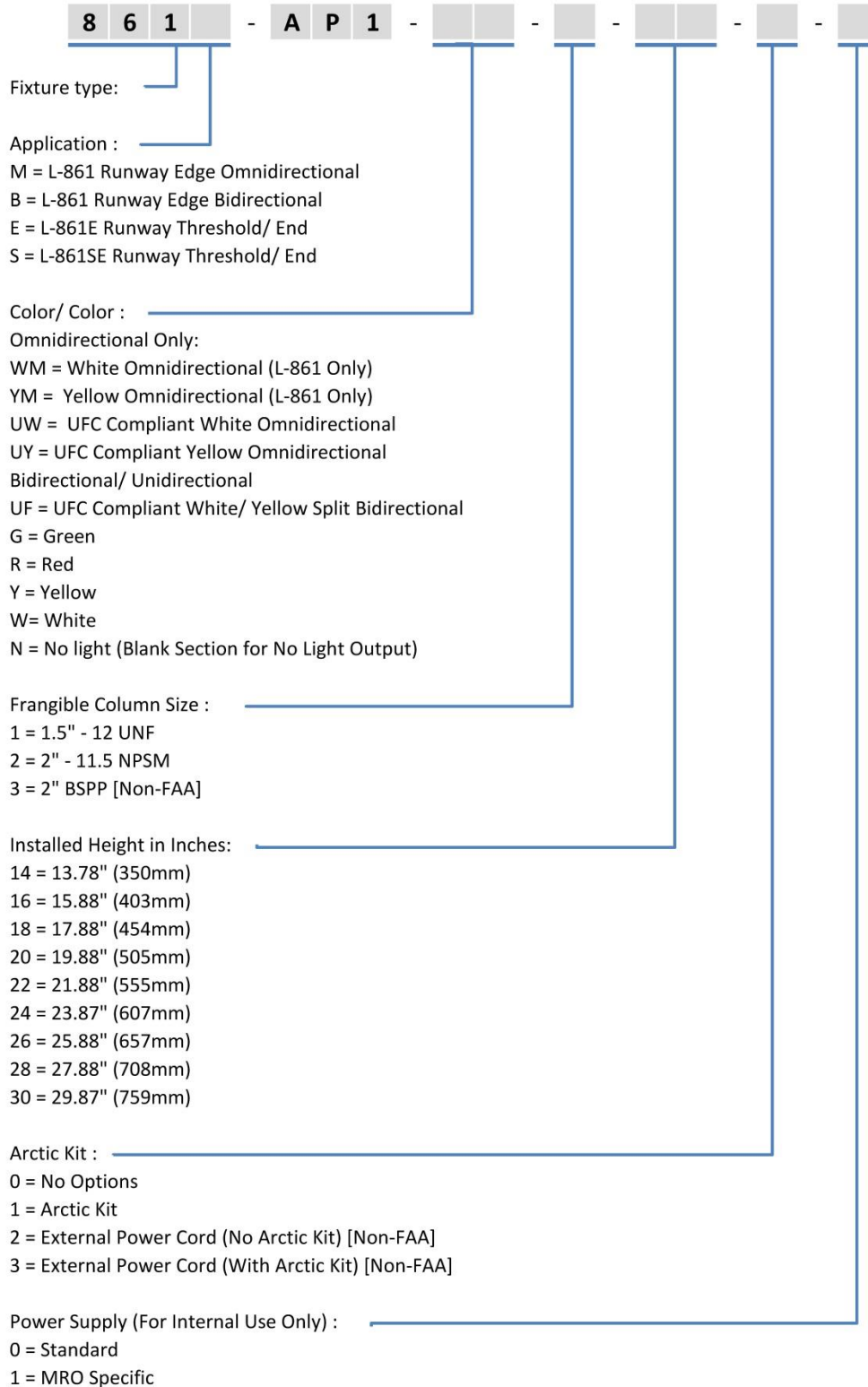
\*International compliances include:

ICAO Annex 14, Volume 1, NATO STANAG 3316, Canada TP312E, U.S. Military UFC-3-535-01, U.S. Navy NAVAIR 51-50AAA-2



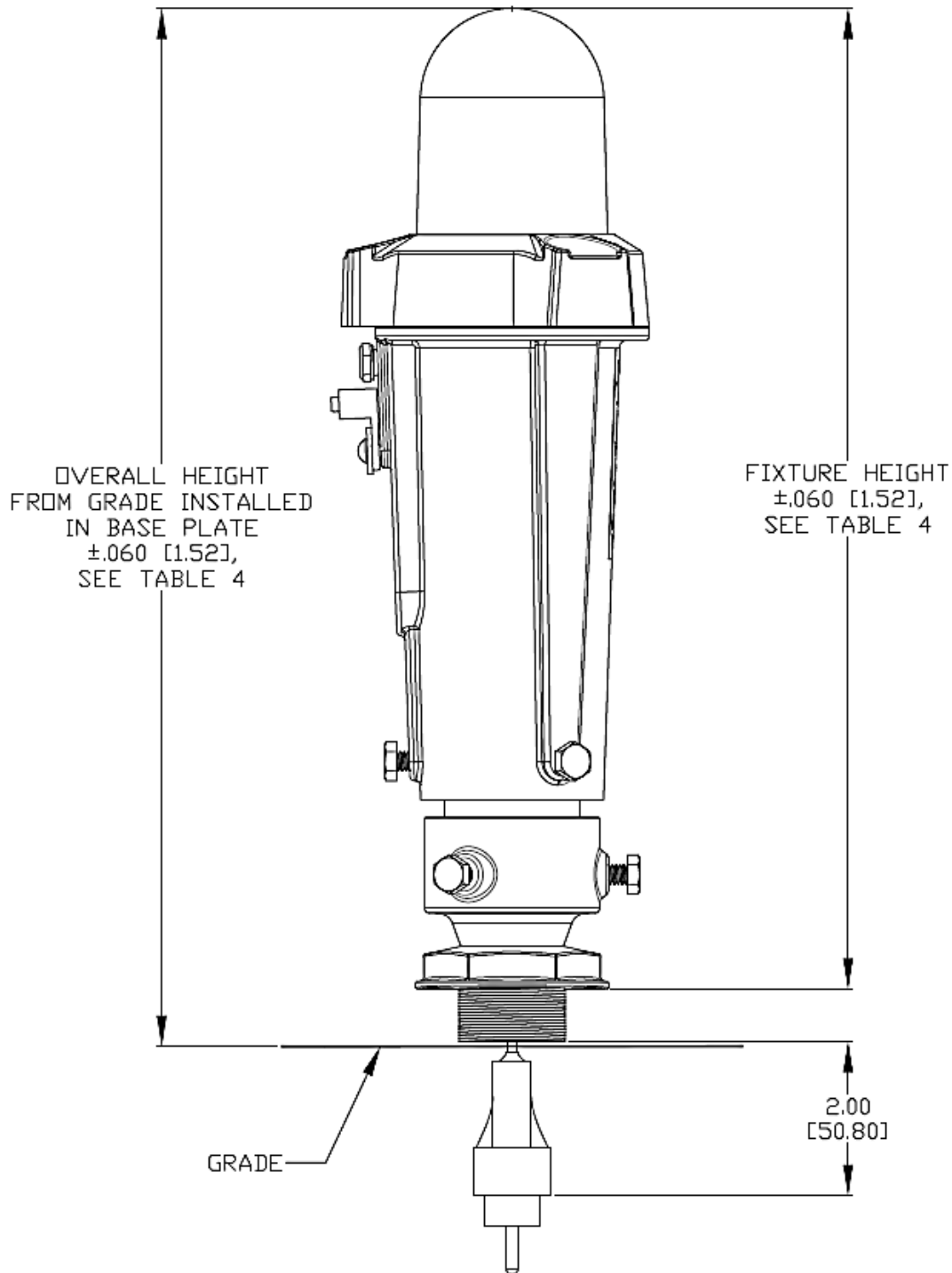
Instruction Manual  
MIRL and MITL,  
AP1 Series

**Table 2, FAA & UFC MIRL**





Instruction Manual  
MIRL and MITL,  
AP1 Series



**FIGURE 1**  
Height Dimensions (Standard Height fixture shown)

Instruction Manual  
MIRL and MITL,  
AP1 Series

Nominal Fixture Height, inches (mm)	Fixture Installed Height in Base Plates AP1935, AP1932 or AP1932BSP at Grade, inches (mm)	Fixture Height From Frangible Coupling Shoulder, inches (mm)
14.0 (355.6)	13.78 (350)	12.75 (323.9)
16.0 (406.4)	15.88 (403)	15.04 (382.0)
18.0 (457.2)	17.88 (454)	17.04 (432.8)
20.0 (508.0)	19.88 (505)	19.04 (483.6)
22.0 (558.8)	21.88 (555)	21.04 (534.4)
24.0 (609.6)	23.88 (606)	23.04 (585.2)
26.0 (660.4)	25.88 (657)	25.04 (636.0)
28.0 (711.2)	27.88 (708)	27.04 (686.8)
30.0 (762.0)	29.88 (759)	29.04 (737.6)

**TABLE 4**  
**Fixture Heights**

Instruction Manual  
MIRL and MITL,  
AP1 Series

7 Installation



**NOTICE**

***WARNING:***

MITL or MIRL foundations/pad and their design are the responsibility of the installer and/or airport and recommendations/suggestions herein are for guidance only. Transformer housing and base plates, series isolation transformers, primary connector kits, heat shrink kits, series loop primary wire, counterpoise cable/wire, grounding rods, ground wire and connectors, base plate bolts are not included as part of the MITL or MIRL. Additionally, the electrical power originating from the CCR and any electrical equipment required to bring utility power or generator power to the CCR is the responsibility of the installer and/or airport. Underlined items may be ordered from Crouse-Hinds Airport Lighting.

- a. Refer to your agency's installation and fixture spacing recommendations (see each agency listing in Section 6.2, "Fixture Type/Color and Agency Compliance") and/or your airport construction plans.



**DANGER**

***DANGER:***

Lock out electrical power to the series loop that will power the MITL or MIRL fixture at its source before attempting any electrical connections/splices per your safety procedures.



**IMPORTANT**

***WARNING:***

Check the MITL or MIRL fixture for shipping damage upon arrival and in all cases, check for damage prior to installation.

Instruction Manual  
MIRL and MITL,  
AP1 Series

- b. A list of tools which can help during installation are referenced in Section 5, “Recommended Test Equipment and Tools”. Figure 2 indicates the name of the fixture parts referenced in the instructions below.
- c. Check the fixture part number before installation to be sure it will be installed at the correct location.
- d. Be sure the correct series isolation transformer size is installed for the fixture; minimum 10/15 watt, 6.6/6.6A secondary without an arctic (heater) kit, or a minimum 20/25 watt or 30/45 watt 6.6/6.6A secondary for fixtures (version dependent) with the arctic kit installed.
- e. Be sure isolation transformer secondary receptacle is properly secured to the base plate or stake mount hub.
- f. Be sure the base plate or stake mount hub size is correct for the frangible coupling for the fixture to be installed. Be sure base plates bolts are torqued and are secured to the L-867 per manufacturer’s recommendations, or stake mounts are installed to the proper depth. Reference FAA AC 150/5340-30 (latest) “Design and Installation Details for Airport Visual Aids”, or your agency’s and/or airport’s construction specifications for guidance.
- g. Apply anti-seize to either the frangible coupling threads or hub threads, fully covering the threads.



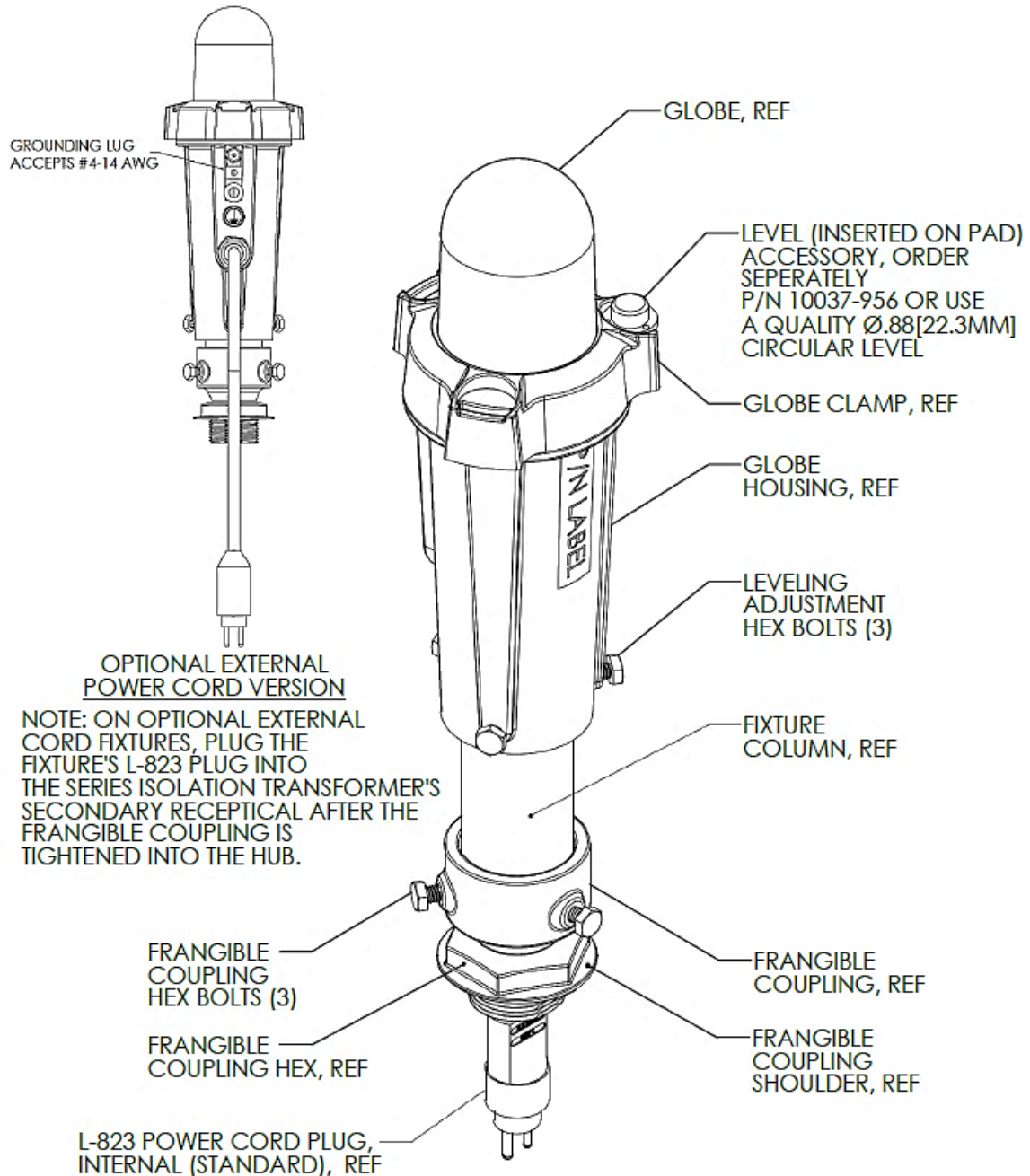
**IMPORTANT**

***WARNING:***

**Failure to apply anti-seize at installation will result in impossible/ to near impossible removal of a frangible coupling from a threaded hub over time.**

- h. Plug the fixture’s L-823 plug into the series isolation transformer secondary receptacle located at the base plate or stake hub. Do not tape or apply shrink tubing to this connection. Note; the internal power cord is sized to an intentional length to help facilitate an electrical disconnect from the isolation transformer secondary if the fixture is sheared-off at its frangible coupling.
- i. Loosen the leveling hex bolts (use a 7/16 or 11mm socket/wrench) on the fixture housing (to prevent the power cord from twisting inside the column), then screw the frangible coupling (with column attached) until its shoulder bottoms-out against the hub. Note; the frangible has a hex feature that will accommodate a 2 inch (50.8 mm) open end wrench.
- j. If the fixture uses a split color globe, rotate the **housing** until the correct color half is on the side of the runway for its intended use (split should be perpendicular to runway centerline).
- k. Tighten the previously loosened fixture housing bolts to 80 in-lbs, +/-5 in-lbs (9.04 +/- .565 Nm).
- l. If the fixture requires leveling, before tightening the previously loosened fixture hex bolts, do the following: Place a level (P/N 10037-956, order separately or a quality .88 inch (22.3 mm) diameter circular level) on one of the globe clamp pads. Grasp the housing and slowly tighten each leveling hex bolt until the bubble is in the center circle of the level. Torque the fixture hex leveling bolts to the proper torque and remove the level.
- m. Return power to the circuit per your safety procedures.

Instruction Manual  
MIRL and MITL,  
AP1 Series



**MIRL/MITL FIXTURE**

**FIGURE 2**

**Fixture Parts Referenced in Installation Instructions**

Instruction Manual  
MIRL and MITL,  
AP1 Series

## 8 Maintenance

### 8.1 General

The preferred method of maintaining a light unit is to periodically replace the unit and return it to the maintenance shop for renovation. As an alternative, the optical assembly can be serviced in the field. Work on electrical circuits should only be performed by qualified electricians with a working knowledge of airfield lighting circuits. However, it is recommended that field servicing be limited to cleaning the globe as described in section 8.3, re-leveling the fixture as described in section 8.4 and semi-annually checking the fixture frangible coupling and the fixture leveling bolt torque. Users should also reference FAA AC 150/5340-26 (latest), Maintenance of Airport Visual Aid Facilities” for their recommended practices for runway and taxiway edge lighting systems. A list of tools which can help during maintenance are referenced in Section 5, “Recommended Test Equipment and Tools”. Figures **3, 4, 5 and 6** will aid in part identification, and Tables **5, 6 and 7** in replacement part number.

### 8.2 Recommended Spares

The number of recommended spare fixtures is 2% of every type installed at the airfield. If the quantity for each type is less than 50, than at least one fixture of every type. The number of individual spare parts should be at least 3% of the total fixtures installed at the airfield, with 3% of each different globe color type in use at the airfield. This number may vary greatly if aggressive snow removal operations occur.



IMPORTANT

### **WARNING:**

**Do not open any light fixture unless the warranty period has expired. Opening a light fixture will void the warranty. Please note that a silica gel desiccant capsule has been added to the housing interior at assembly to absorb any moisture/humidity that may have been present during assembly. DO NOT CONSUME THE SILICA GEL!**

### 8.3 Cleaning the Globe

The globe exterior may be cleaned with water or a good glass cleaner to remove any dirt or bird droppings residue.

### 8.4 Re-Leveling the Fixture

If the fixture requires re-leveling (levelness should be checked when servicing fixtures, or on a semi-annual basis when checking fixture hex bolts torque [torque is the same for **all** exterior hex bolts]), level with a Crouse-Hinds 10037-956 circular level on one of the leveling pads (be sure pad surface is clean of sand, snow or ice). Note, if the column appears out of level in the frangible coupling,



Instruction Manual  
MIRL and MITL,  
AP1 Series

loosen its hex bolts first, re-position the column and torque the frangible bolts to the proper torque value before proceeding with fixture leveling. Loosen the leveling hex bolts (see Figure 2) (use a 7/16 or 11 mm socket/wrench) on the fixture housing. Grasp the housing and slowly tighten each leveling hex bolt until the bubble is in the center circle of the level. Torque the fixture leveling bolts to the proper torque (80 +/- 5 in-lbs [9.04 +/- .565 Nm]) and remove the level.



**DANGER**

***DANGER:***

**Lock out electrical power to the series loop that will power the MITL or MIRL fixture at its source before attempting servicing to the fixture.**



**DANGER**

***DANGER:***

**Do not remove the fixture from the base plate or stake mount while the fixture is powered. Dangerous voltage may be present on the primary and secondary sides of the isolation transformer.**



**CAUTION**

***CAUTION:***

The globe clamp has factory applied anti-seize (gray color substance) applied to its threads (Henkel/Loctite P/N 80209 ( <http://hybris.cms.henkel.com/henkel/msdspdf?country=US&language=EN&matnr=235092> )). The underside of the globe clamp has factory applied silicon grease (White color substance) (Dow Corning MOLYKOTE 1292 (<http://www1.msdirect.com/MSDS/MSDS00004/31735186-20110702.PDF>)). See the manufacturer's Safety Data Sheet for any special precautions/ first aid. Note, this anti-seize will permanently stain clothing. LED/Heat sink assembly used with red/red, red/blank, and any globe with a green color have thermal grease (white color substance) ( Fuchs Lubricants Co. Chemplex 1381 DE ( [http://www.fuchs.com/fuchs\\_precontact.php](http://www.fuchs.com/fuchs_precontact.php) ) between the circuit card and the Aluminum heat sink. See the manufacturer's Safety Data Sheet for any special precautions/first aid. For both of these products

Instruction Manual  
MIRL and MITL,  
AP1 Series

**at a minimum; avoid contact with eyes, ingestion, and contact with skin. Proper PPE should be worn.**



**IMPORTANT**

**WARNING:**

**Every time a fixture is opened, it's O-ring and Top & Bottom globe gasket should be replaced. O-rings and globe gaskets will develop a permanent deformation over time. Failure to replace them when the fixture is opened may result in a fixture leak. Do not apply silicon grease to the fixture O-ring or bottom globe gasket. You may apply silicon grease to the top globe gasket top surface or the globe clamp interior surface that will contact the top globe gasket to prevent friction when tightening. Use only the Gaskets and O-ring listed in table 5 with each other due to thickness & durometer.**

## 8.5 Replacing the Globe

It may be necessary to replace the globe due to breakage or etching of globe from wind-blown sand. Lockout power to the fixture. Un-screw the globe clamp (this operation may need to be done in your maintenance facility), remove the globe, globe gasket and O-ring (un-plug the LED/Heat sink from the power supply). Use caution on broken globes due to sharp edges. All pieces of the broken globe should be removed from the housing interior. Pieces of broken globe should also be removed from around the area of the pavement to minimize foreign object damage (FOD) on the airfield. Discard the old O-ring, Top & bottom globe gasket, globe and desiccant capsule. Place the new O-ring in the fixture under the LED/Heat sink, be sure LED/Heat sink module leads are re-attached to the power supply correctly as LED polarity matters (Figure 5A), with the power supply *power* terminals located near the base of housing. Align the correct globe color half (if split color globe) to the correct LED color (color dot on heat sink will match globe color, except MIRL yellow, white/yellow, white/red, and yellow/red will use the "white" [white LED] dot LED heat sink) and the globe split parallel with the heat sink horizontal top surface (Figure 7N). Place the new bottom globe gasket on top of the LED/Heat sink assembly. Place a new top globe gasket on the top of the globe flange & See 'IMPORTANT' notice about silicon grease above 8.5. Holding globe firmly at top (to prevent the globe and heat sink from spinning during assembly), screw the globe clamp all the way down until it stops. With a strap type wrench, turn the globe clamp approximately 1/16 to 1/4 additional revolution. If the globe is split color, realignment of the color split is required to be perpendicular to the runway centerline, see Section 7.i., j., k., & l. Return power to the fixture per your safety procedures. If globe has an arctic (heater) kit attached, see Section 8.7 for additional information.

## 8.6 Replacing the Frangible Coupling or Housing Column

It may be necessary to replace the frangible coupling and possibly the housing column due to damage from snow removal operations, vehicle damage or aircraft damage. Lockout power to the

Instruction Manual  
MIRL and MITL,  
AP1 Series

fixture. Unplug the fixtures L-823 power plug from the isolation transformer's L-823 secondary receptacle. Check the fixture L-823 plug and leads for damage. If damaged, replace; see Section 9.8. Remove the broken frangible coupling half from the column and discard. Check the fixture column for damage or deformation. Replace it and the housing hex bolts holding it with the correct length column for the fixture part number. Do not tighten at this time. Remove the broken frangible half from the base plate or stake hub. Attach the new frangible coupling to the column with new hex head bolts. Tighten these hex bolts with a 7/16 or 11 mm socket/wrench, centering the column in the frangible as it is tightened, to 80 in-lbs, +/- 5 in-lbs (9.04 +/- .565 Nm). Install the fixture per instructions in Section 7.f. through m.

## 8.7 Replacing the Arctic Kit (heater)

It may be necessary to replace the globe due to breakage or etching of globe from wind-blown sand. This will also require replacing the heater element of the arctic kit. Lockout power to the fixture. Un-screw the globe clamp (this operation may need to be done in your maintenance facility), remove the globe, globe gasket and O-ring (unplug the LED/Heat sink and current arctic kit heater thermistor cable and power leads (insulated flag terminals) from the power supply). Use caution on broken globes due to sharp edges. All pieces of the broken globe should be removed from the housing interior. Pieces of broken globe should also be removed from around the area of the pavement to minimize foreign object damage (FOD) on the airfield. Discard the old O-ring, Top & bottom globe gasket, globe and desiccant capsule. The new heater must be applied to the globe interior. The globe interior **must be washed** with **warm water only** (absolutely no glass cleaners or alcohol) and dried, or allowed to **dry prior** to application of the heater. Read these next instructions prior to removing the backing covering the heater adhesive, and practice its application. Remove the backing over the sticky adhesive on the heater. The straight surface side of the heater will be applied approximately 1/8 (3.18 mm) above the globe bottom flange to the interior wall in a straight horizontal line. Gently stick the heater at its center at this imaginary line, and applying pressure, roll the remainder of the heater out towards its end. Be sure to apply pressure to squeeze out air bubbles. **Do not** re-lift the heater after it is applied to the glass dome interior, as it will lose its adhesion. If the heater is used on a split color globe, attention must be paid to its "tail" (leads with insulated flag terminals, temperature sensor (round silver diameter) and the two pin heater sensor cable attachment located on it) prior to adhering it to the globe interior. This "tail" position is to be centered on one of the split globe half colors so this "tail" can be routed through one of the LED/Heat sink assembly voids towards the housing interior on the same side as the power supply terminals. Place the new O-ring in the fixture under the LED/Heat sink. Being careful of the globe and heater, attach the heater flag terminals (its power, terminals factory machined crimped) to the power supply in the correct position (Figure 5B). Attach the heater sensor (thermistor) cable to the heater (two pins) and power supply (polarity does not matter on this cable), and be sure LED/Heat sink module leads are reattached to the power supply correctly as LED polarity matters (Figure 5B), with the power supply *power* terminals located near the base of the housing. Align the correct globe color half (if split color globe) to the correct LED color (color dot on heat sink will match globe color, except MIRL yellow, white/yellow, white/red, and yellow/red will use the "white" [white LED] dot LED heat sink) and the globe split parallel with the heat sink horizontal top surface (Figure 7N). Place the new bottom globe gasket on top of the LED/Heat sink assembly. Place a new top globe gasket on the top of the globe flange & see 'IMPORTANT' notice about silicon grease above 8.5. Holding globe firmly at top (to prevent the globe and heat sink from spinning during assembly), screw the globe clamp all the way down until it stops. With a strap type wrench, turn the globe clamp approximately 1/16 to 1/4 additional revolution. If the globe is split color, realignment

Instruction Manual  
MIRL and MITL,  
AP1 Series

of the color split is required to be perpendicular to the runway centerline, see Section 7.i., j., k., & l. Return power to the fixture per your safety procedures. Note, always replace the globe gasket and O-ring. See Section 8.5.

Note: The Arctic Kit turns *on* when the fixture interior temperature reaches 12.4 degrees C (54 degrees F), and *off* when the fixture interior temperature reaches 25 degrees C (77 degrees F). This will ensure that it does not turn on/off prematurely due to interior temperatures, and also meet the FAA on/off requirements of FAA EB 67 (latest). The heater uses 16 watts (VA).



**Photo of Arctic Kit Heater Adhered to Globe Interior**



**IMPORTANT**

**WARNING:**

**The heater will remain on indefinitely with the temperature sensor disconnected (thermistor cable not connected).**

## 8.8 Replacing the Fixture Power Cord

It may be necessary to replace the fixture power cord due to damage when a frangible coupling is broken. The power cord comes from the factory in its cord grip housing with its external length set to the correct dimension for the fixture height ordered. The cord has the insulated flag terminals machined crimped at the factory. Lockout power to the fixture. Remove all parts from the fixture (refer to other sections of this maintenance guide as required), except the external hex head bolts. Be careful of the heater while removing a globe from an arctic kit fixture. Remove the old power cord and its cord grip. For both internal and external power cords, save the ferrite that is snapped around the leads near where it exits the housing interior by sliding it up and unsnapping it from around the power cord leads. If present save the hex nut located inside the housing for reuse. Do not apply Teflon Tape if using this internal hex nut. Discard the old O-ring, Top & bottom globe gasket, power cord and its cord grip and desiccant capsule. Install the threaded cord grip into the interior threaded hole after first applying 2 to 3 layers of Teflon tape to cord grip threads at least 1 thread below the stationary hex feature on the cord grip using a 1 inch wrench on the hex feature of the cord grip, torque to 50 in-lbs (5.65 Nm). This hex feature should bottom-out against the housing when tightened. For external power cord fixture, apply 2 to 3 layers of Teflon tape to the cord grip threads at least 1 thread below the stationary hex feature and then install into the threaded hole on the side

Instruction Manual  
MIRL and MITL,  
AP1 Series

of the housing after these housing threads have been clean of any residue. Tighten this cord grip using a 1-1/16 inch wrench on the center hex feature of the cord grip. Torque to 50 in-lbs (5.65 Nm). This hex feature should bottom-out against the housing when tightened. All cord grips contain an integral seal under this hex feature. Install the power cord flag terminals onto the power supply mating tabs referencing Figure 5A or 5B for correct position. Note, the power supply installs in the housing with the flag terminal connections toward the bottom of the housing interior. The ferrite should be snapped around the power cord leads and then pushed as close as possible to the housing interior bottom with the power supply in place. Any excess power cord length should be inserted behind the power supply. Reference Sections 8.5, 8.6, 8.7, 8.9 and 8.10 for proper re-installation of these removed parts. Note, always replace the globe gaskets and O-ring.

## 8.9 Replacing the LED/Heat sink Assembly

There are two unique styles of LED/Heat sink assemblies, refer to Figure 7 versions. The omnidirectional (“Omni”) style has its LED connector to the power supply soldered onto the LED circuit board. Care should be exercised not to tug on the LED connector lead assembly, as this may break the solder connections on the circuit card. The LED/Heat sink assembly has the color of the LED marked on its side. Note; the white “Omni” LED is used on full globe colors white, yellow; and split globe colors white/yellow, white/red, and yellow/red. “Bi-directional” LED/Heat sink assemblies will have the color of the LED for each particular side. These “bi-directional” LED/Heat sink assemblies will have various configurations of LED and lens placements dependent on its version use. The “bi-directional” LED/Heat sink assembly has a removable connector that mates/snaps to a housing on the circuit card(s). This connector only fits in one way into this housing. If it is a dual LED connector for a circuit card on each side of the heat sink, it does not matter which connector snaps into a mating circuit card housing. The “bi-directional” heat sink pins fit behind the vertical cast housing bosses that position the power supply. Additionally, all LED/Heat sink assemblies have their part number marked on its side. Lockout power to the fixture. Be careful removing a globe from the fixture with an arctic kit. Un-screw the globe clamp (this operation may need to be done in your maintenance facility), remove the globe, globe gasket and O-ring (un-plug the LED/Heat sink from the power supply). Discard the old O-ring, Top & bottom globe gasket, LED/Heat sink assembly and desiccant capsule. Place the new O-ring in the fixture under the new LED/Heat sink, be sure LED/Heat sink module leads are re-attached to the power supply correctly as LED polarity matters (Figure 5A), with the power supply *power* terminals located near the base of the housing. Align the correct globe color half (if split color globe) to the correct LED color (color dot on heat sink will match globe color, except MIRL yellow, white/yellow, white/red, and yellow/red will use the “white” [white LED] dot LED heat sink) and the globe split parallel with the heat sink horizontal top surface (Figure 7N). Place the new bottom globe gasket on top of the LED/Heat sink assembly. Place a new top globe gasket on the top of the globe flange & see ‘IMPORTANT’ notice about silicon grease above 8.5. Holding globe firmly at top (to prevent the globe and heat sink from spinning during assembly), screw the globe clamp all the way down until it stops. With a strap type wrench, turn the globe clamp approximately 1/16 to 1/4 additional revolution. If the globe is split color, realignment of the color split is required to be perpendicular to the runway centerline, see Section 7.i., j., k., & l. Return power to the fixture per your safety procedures. If globe has an arctic (heater) kit attached, see Section 8.7 for additional information.

Instruction Manual  
MIRL and MITL,  
AP1 Series



**WARNING**

***WARNING:***

**A buzzing or humming noise coming from the isolation transformer may indicate a failed power supply or LED module. It is also an indicator of dangerous voltage on the primary and secondary sides of the isolation transformer.**



**NOTICE**

***WARNING:***

**A grounded ESD Wrist Strap should be worn by personal working on or handling fixture power supplies or LED/Heat sink assemblies. ESD Wrist Straps, also known as anti-static wrist straps, are used to prevent electrostatic discharge (ESD) by safely grounding a person working with electronic equipment.**

### **8.10 Replacing the Power Supply**

Lockout power to the fixture. Be careful removing a globe from the fixture with an arctic kit. Unscrew the globe clamp (this operation may need to be done in your maintenance facility), remove the globe, globe gasket and O-ring (un-plug the LED/Heat sink and power cord leads from the power supply). If this is a non-arctic kit fixture, remove the heater jumper lead assembly from the power supply for reuse. Save the jumpers if present from the power supply J203 connector for reuse in other power supplies. Removed parts should be checked for obvious signs of damage and replaced if their integrity is in question. Discard the old O-ring, Top & bottom globe gasket, power supply and desiccant capsule.



**IMPORTANT**

***WARNING:***

**Reuse of existing MITL/MIRL power supplies is acceptable if no damage to the power supply is present. The power supply's e-prom must first be reset to achieve correct detection of LEDs out. This procedure must also be done for new power supplies to be sure its e-prom is set for the fixture's LED(s) it will be used in. See Section 8.11.**

Instruction Manual  
MIRL and MITL,  
AP1 Series



**CAUTION**

**CAUTION:**

**Power supply is hot (temperature) when the fixture is energized and remains hot for a short time after the fixture is turned off.**

Install the power supply into the housing after the e-prom has been reset per Section 8.11. Install the heater jumper lead assembly insulated flag terminals onto the appropriate terminals of the power supply if this is a non-arctic kit fixture and also the power lead insulated flag terminals, see Figure 5A. Place the new O-ring in the fixture under the LED/Heat sink, be sure LED/Heat sink module leads are re-attached to the power supply correctly as LED polarity matters (Figure 5A), with the power supply *power* terminals located near the base of the housing. Align the correct globe color half (if split color globe) to the correct LED color (color dot on heat sink will match globe color, except MIRL yellow, white/yellow, white/red, and yellow/red will use the “white” [white LED] dot LED heat sink) and the globe split parallel with the heat sink horizontal top surface (Figure 7N). Place the new bottom globe gasket on top of the LED/Heat sink assembly. Place a new top globe gasket on the top of the globe flange & see ‘IMPORTANT’ notice about silicon grease above 8.5. Holding globe firmly at top (to prevent the globe and heat sink from spinning during assembly), screw the globe clamp all the way down until it stops. With a strap type wrench, turn the globe clamp approximately 1/16 to 1/4 additional revolution. If the globe is split color, re-alignment of the color is required to be perpendicular to the runway centerline, see Section 7.i., j., k., & l. Return power to the fixture per your safety procedures. If globe has an arctic (heater) kit attached, see Section 8.7 for additional information.



**IMPORTANT**

**WARNING:**

**The jumpers (on power supply J203) must be in the correct position(s) for proper operation of the appropriate fixture.**



**NOTICE**

**WARNING:**

**Applying input current to the power supply without the arctic kit heater or the heater jumper lead assembly installed on the power supply will cause damage to the power supply.**



**IMPORTANT**

**WARNING:**

**Applying a constant voltage greater than 50V (AC or DC) to the input will cause damage to the power supply.**

Instruction Manual  
MIRL and MITL,  
AP1 Series

### 8.11 Resetting a MITL/MIRL Power Supply's E-Prom

If a new or existing MITL/MIRL power supply is to be installed in an existing MITL/MIRL fixture as a replacement part, the following must be done (except if the basic MIRL/MIRL part number and color combination(s) are the same as the fixture it will be reused for). This process is required to reset to power supply's e-prom for detecting the number of LEDs that could be out, based on the LED's forward voltage it will be used with. This is best accomplished in your maintenance facility following safe electrical practices during the reprogramming of the power supplies, as *dangerous currents* will be present on exposed connections when the power supply is energized.



**DANGER**

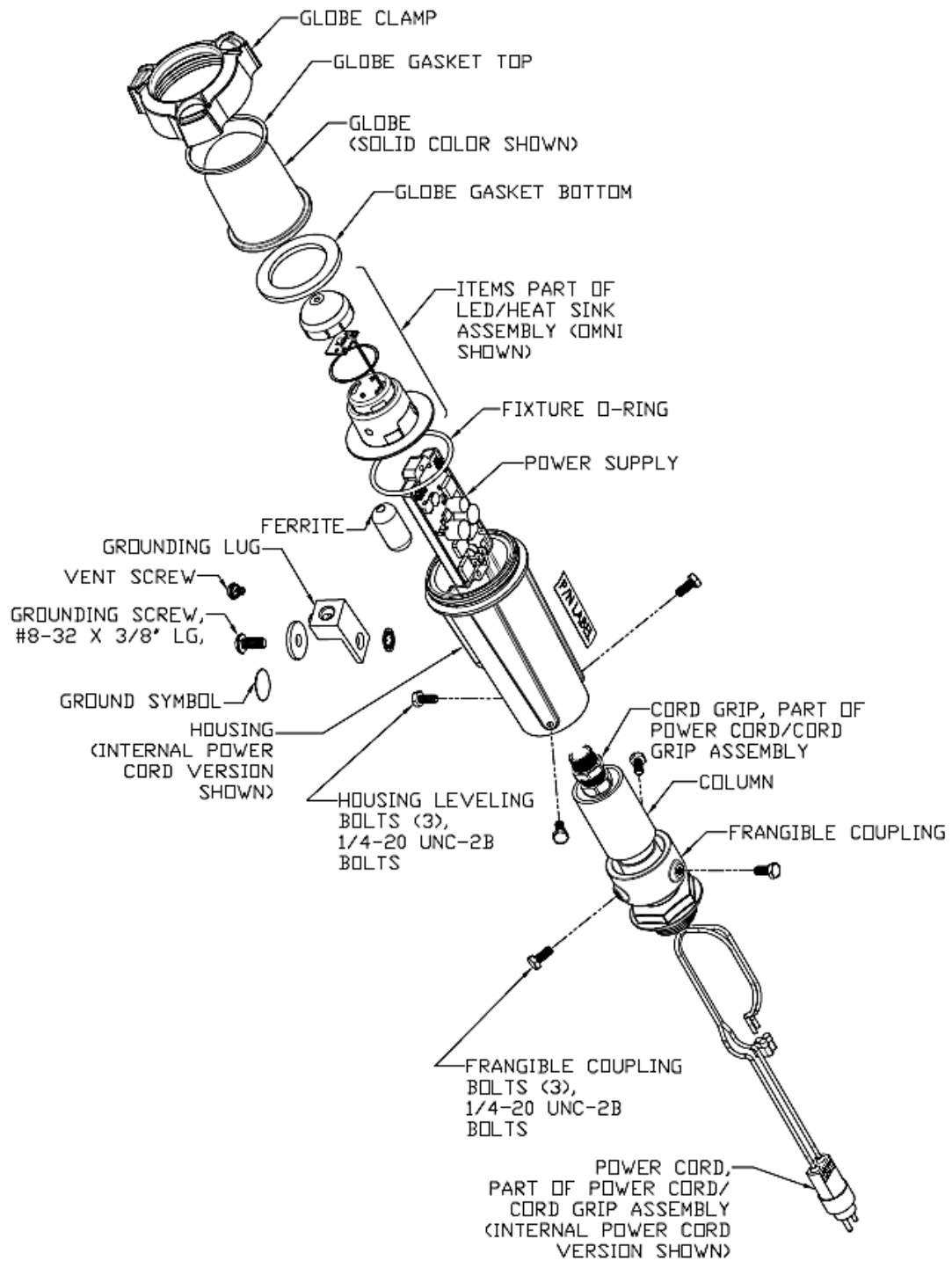
***DANGER:***

**Lock out electrical power to the MITL/MIRL power supply prior to reprogramming jumper set-up, and after reprogramming during removal of programming jumper.**

With power off, add a jumper, 10047-1677 to power supply J200 between positions 1 and 2. Attach the LED type to be used with the power supply, installing the correct jumpers to J203 if required per Table 7 and Figure 6. Also refer to Figures 5B (install a jumper lead assembly between P102 and P103 if not present). Install the LED/heat sink lead assembly to the power supply per Figure 5A. With all personal safely isolated from your maintenance facility reprogramming set-up, energize the circuit. The circuit must run for a minimum of 10 seconds, and with the power supply at the high step of 6.6A during this 10 second minimum for the e-prom to reset and accept its new settings. The power supply will blink the LED after 10 seconds, indicating it has been reset. Remove the jumper from power supply J200, positions 1 to 2 after the power supply is safely de-energized after the 10 second minimum reset period.



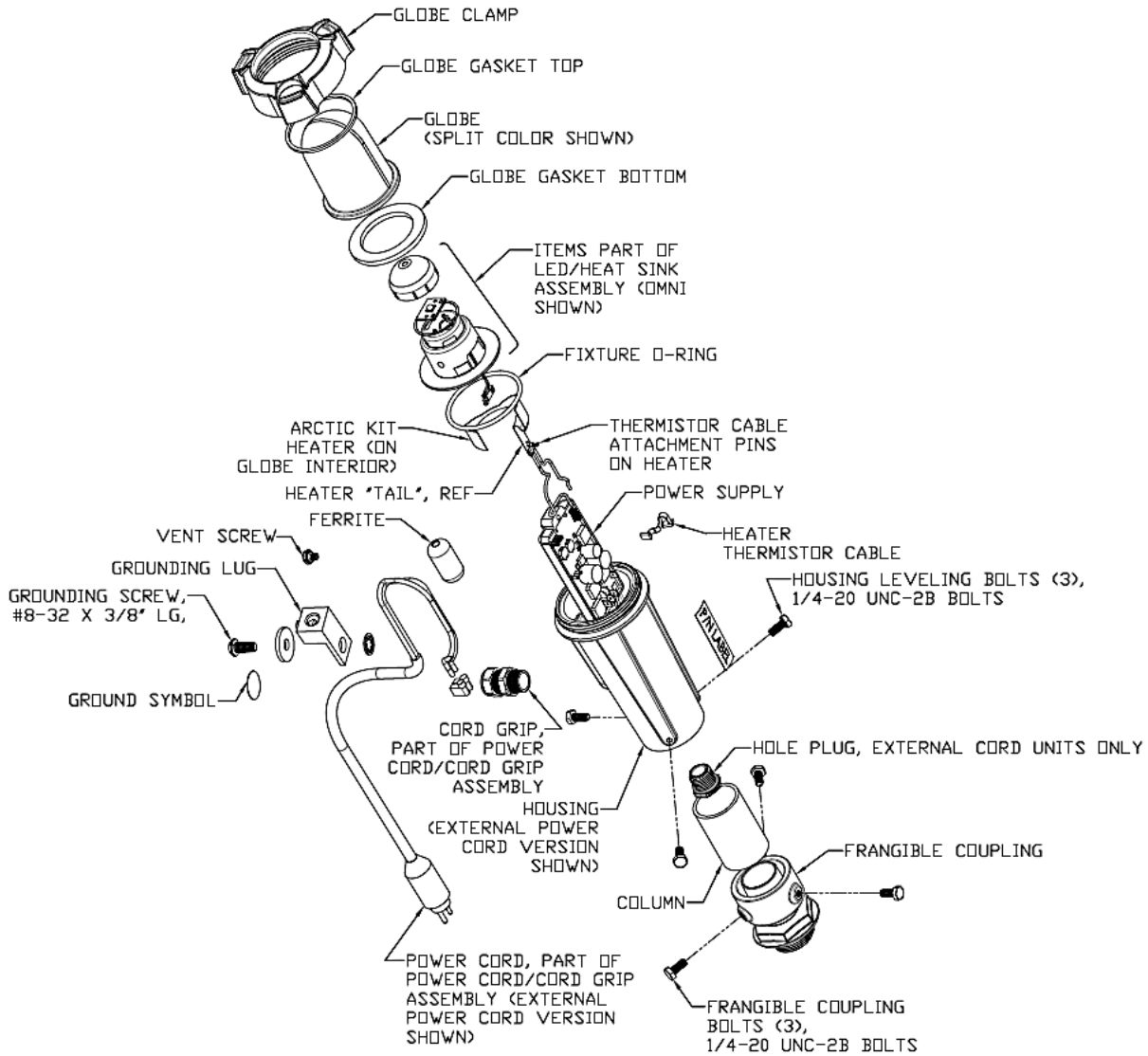
Instruction Manual  
MIRL and MITL,  
API Series



**FIGURE 3A**

**MIRL/MITL Fixture Parts Identification, Internal Power Cord Versions**

Instruction Manual  
MIRL and MITL,  
AP1 Series



**FIGURE 3B**  
**MIRL/MITL Fixture Parts Identification, External Power Cord Versions**

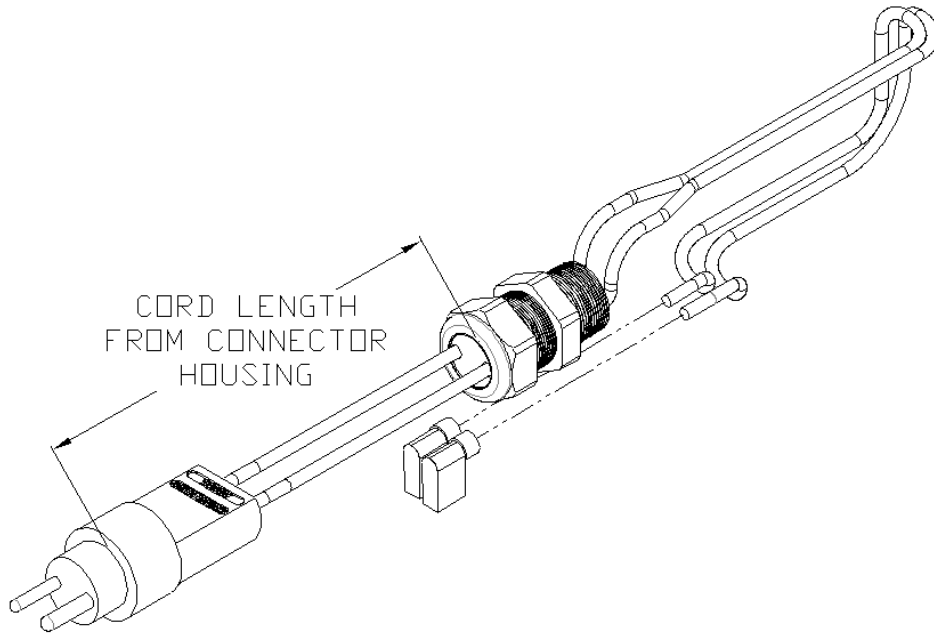
Instruction Manual  
MIRL and MITL,  
AP1 Series

PART	PART NUMBER	DESCRIPTION/USE or QUANTITY
GLOBE	See Table 7	1 per fixture
LED/HEAT SINK ASSEMBLY	See Table 7	1 per fixture
GLOBE GASKET	*50741	1 per fixture
GLOBE CLAMP	50618	1 per fixture
FIXTURE O-RING, X-PROFILE	*10035-0072	1 per fixture
FERRITE	10047-3130	1 per fixture
POWER SUPPLY	21696-2	1 per fixture
POWER SUPPLY J203 JUMPER	10047-3090	2 (not shown) per power supply, except with FAA MITL (blue)
POWER SUPPLY JUMPER LEAD ASSEMBLY	50650	1 per fixture without Arctic Kit
ARCTIC KIT (HEATER)	50670	1 per fixture with Arctic Kit
HEATER THERMISTOR CABLE	10047-3132	1 per fixture with Arctic Kit
LED TO POWER SUPPLY CABLE, SINGLE	50561-1	1 (not shown) per fixture if Figure 7D, G, M or N LED/ Heat Sink Assembly
LED TO POWER SUPPLY CABLE, DUAL	50561-2	1 (not shown) per fixture if Figure 7C, E, F, H, J, K or L LED/ Heat Sink Assembly
HOUSING, INTERNAL CORD	50615-1	1 per fixture if based on if Internal or External Power Cord
HOUSING, EXTERNAL CORD	50615-2	
HEX NUT, CORD GRIP OR HOLE PLUG	10037-958	1 per fixture
HOLE PLUG	10037-961	1 per fixture if External Power Cord
POWER CORD/CORD GRIP ASSEMBLY	See Table 6	1 per fixture, be sure if Internal or External Cord that the Housing corresponds
COLUMN	See Table 6	1 per fixture
FRANGIBLE COUPLING, 1-1 1/2" UNF-12	50617-1	
FRANGIBLE COUPLING, 2"-11 1/2 NPSM	50617-2	1 per fixture, see Tables 1,2 or 3
FRANGIBLE COUPLING, 2-11 BSPP	50617-3	
1/4-20 UNC-2A BOLT, 5/8 LONG, 18-8	10000-573	6 per fixture
POWER SUPPLY PROGRAMMING JUMPER	10047-1677	1 per facility to reset Power Supply E-Prom, see Section 8.11
GROUNDING TERMINAL, SOLDERLESS, #4-14, ALUMINUM	10047-3141	1 per fixture, Reference Figure 2 (Use hardware 11A22-019D, 11A02-016D & 10000-0608 to attach it to housing)
TOP GLOBE GASKET	*50742	1 per fixture
VENT, M6x0.75	10037-1024	1 per fixture

\* USE ONLY THESE GASKETS & O-RING IN COMBINATION WITH EACH OTHER DUE TO THICKNESS & DUROMETER.

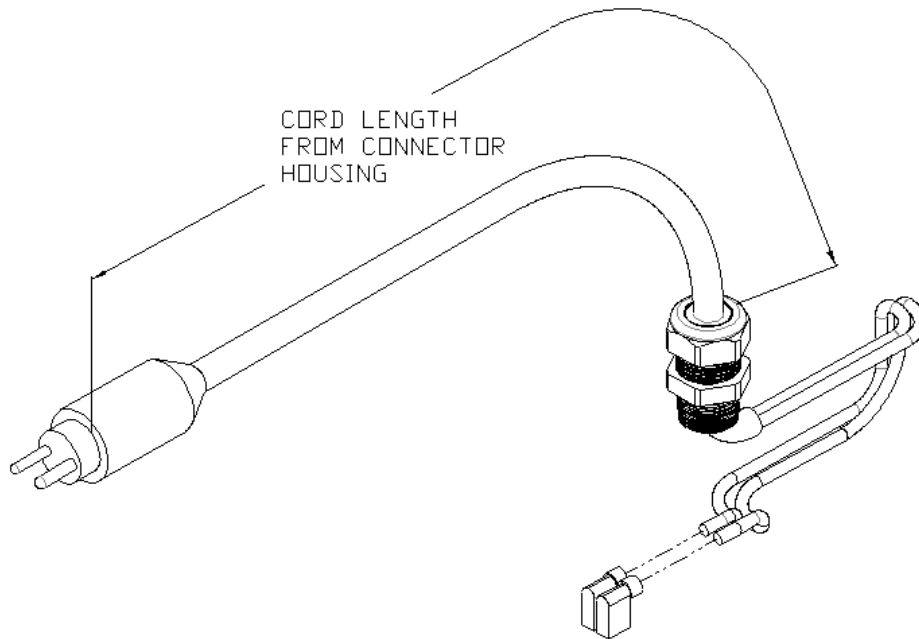
**TABLE 5**  
**MIRL/MITL Parts Identification, Figures 3A and 3B**

Instruction Manual  
MIRL and MITL,  
AP1 Series



**FIGURE 4A**

**Power Cord Length from Connector Housing, Internal Power Cord Fixtures**



**FIGURE 4B**

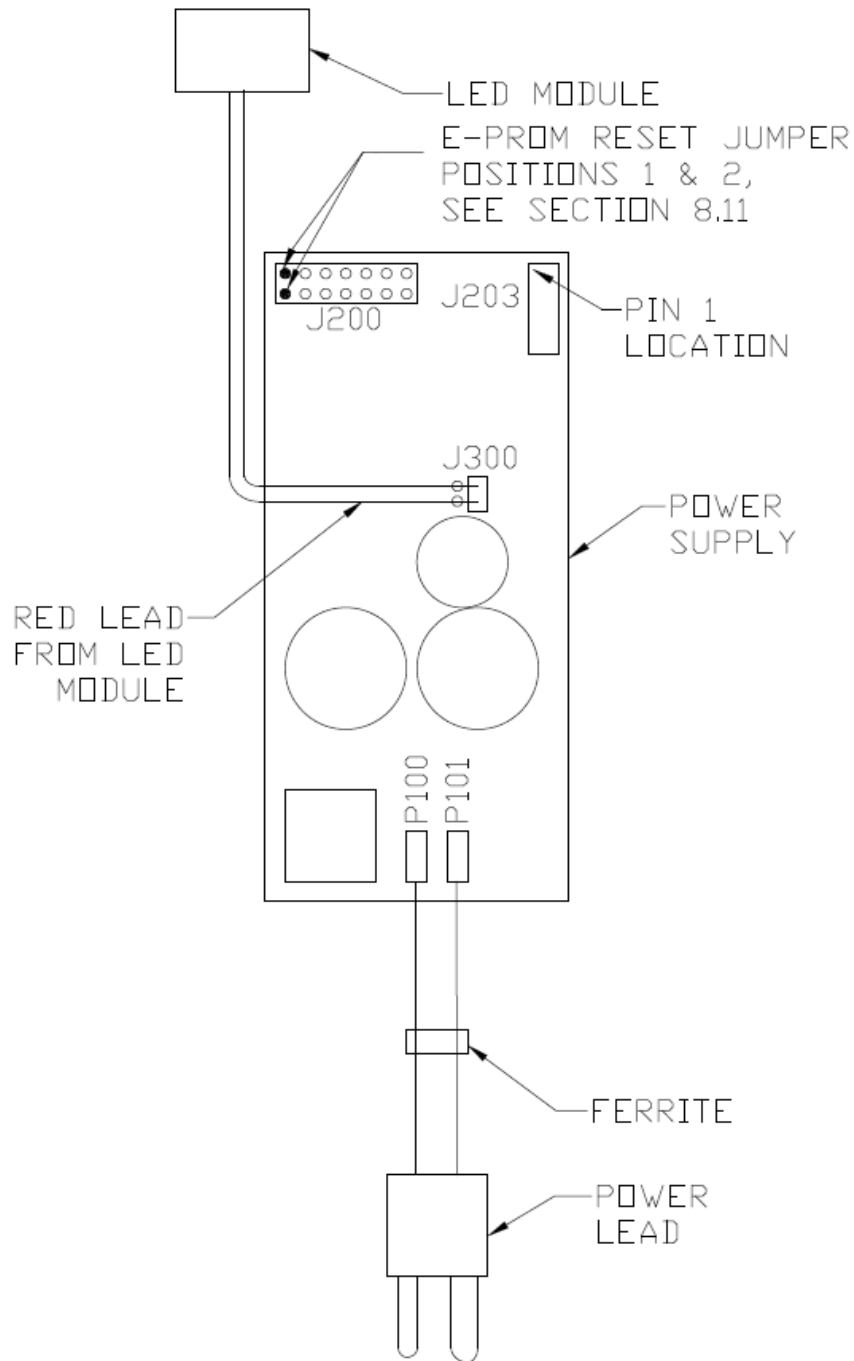
**Power Cord Length from Connector Housing, External Power Cord Fixtures**

Instruction Manual  
MIRL and MITL,  
API Series

Nominal Fixture Height, inches (mm) [See Table 4]	Column Part Number	Length, inches (mm)	Internal Cord/Cord Grip Assembly P/N (Ref Figure 4A)	Cord Length from Grip Exterior of the Housing ( <b>Internal Cord</b> ), inches (mm)	External Cord/Cord Grip Assembly P/N (Ref Figure 4B)	Cord Length from Grip Exterior of the Housing ( <b>External Cord</b> ), inches (mm)
14.0 (355.6)	50621-1	2.56 (65.08)	50671-1	5.13 (130.3)	50672-1	18.5 (469.9)
16.0 (406.4)	50621-2	4.85 (123.19)	50671-2	7.42 (188.5)	50672-2	28.8 (731.5)
18.0 (457.2)	50621-3	6.85 (173.19)	50671-3	9.42 (239.3)	50672-2	28.8 (731.5)
20.0 (508.0)	50621-4	8.85 (224.79)	50671-4	11.42 (290.1)	50672-2	28.8 (731.5)
22.0 (558.8)	50621-5	10.85 (275.59)	50671-5	13.42 (340.9)	50672-2	28.8 (731.5)
24.0 (609.6)	50621-6	12.85 (326.39)	50671-6	15.42 (391.7)	50672-2	28.8 (731.5)
26.0 (660.4)	50621-7	14.85 (377.19)	50671-7	17.42 (442.5)	50672-3	34.8 (883.9)
28.0 (711.2)	50621-8	16.85 (427.99)	50671-8	19.42 (493.3)	50672-3	34.8 (883.9)
30.0 (762.0)	50621-9	18.85 (478.79)	50671-9	21.42 (544.1)	50672-3	34.8 (88.39)

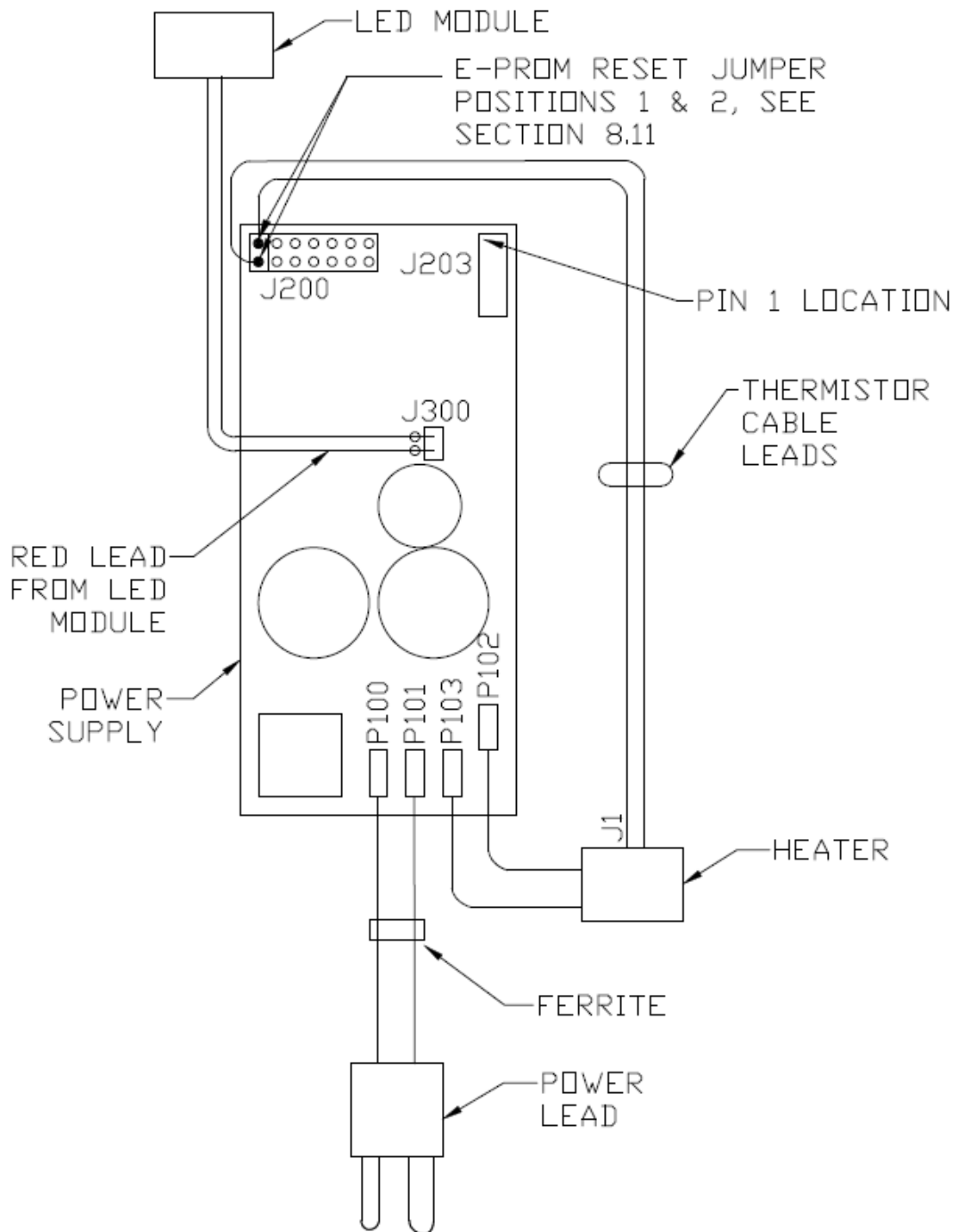
**TABLE 6**  
**Power Cord / Cord Grip Assemblies**

Instruction Manual  
MIRL and MITL,  
AP1 Series



**FIGURE 5A**  
**Power Supply Connections without an Arctic Kit (Heater)**

Instruction Manual  
MIRL and MITL,  
AP1 Series



**FIGURE 5B**  
**Power Supply Connection with an Arctic Kit (Heater)**

Instruction Manual  
MIRL and MITL,  
AP1 Series



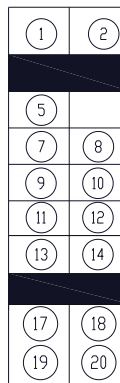
**FIGURE 6A**

Power Supply J203 Jumper positions, See Table 7



**FIGURE 6B**

Power Supply J203 Jumper positions, See Table 7

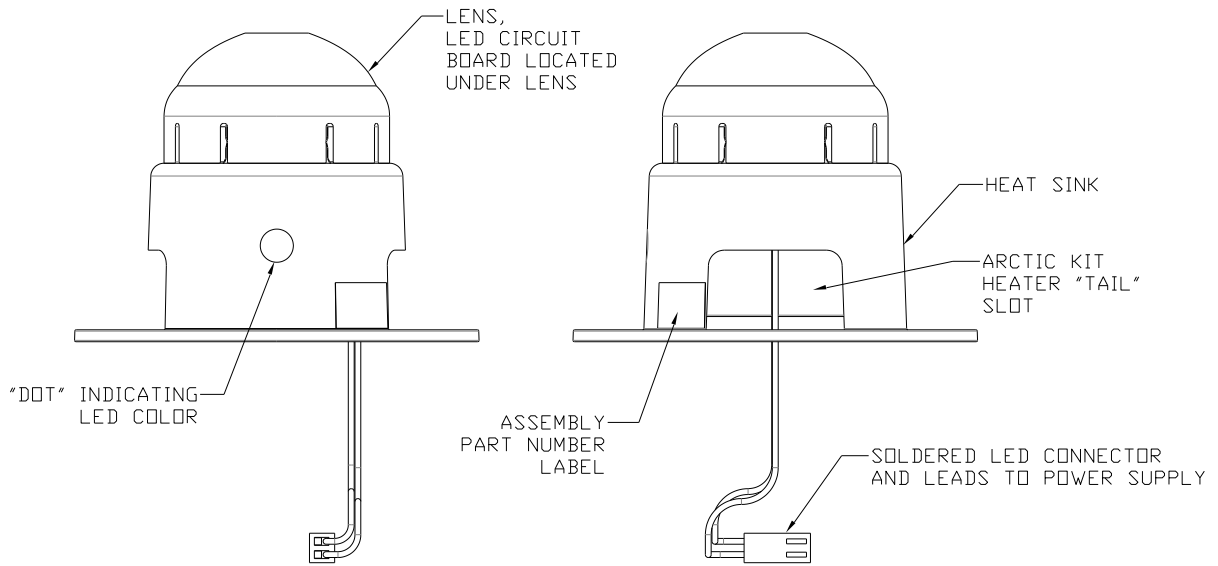


**FIGURE 6C**

Power Supply J203 Jumper positions, See Table 7



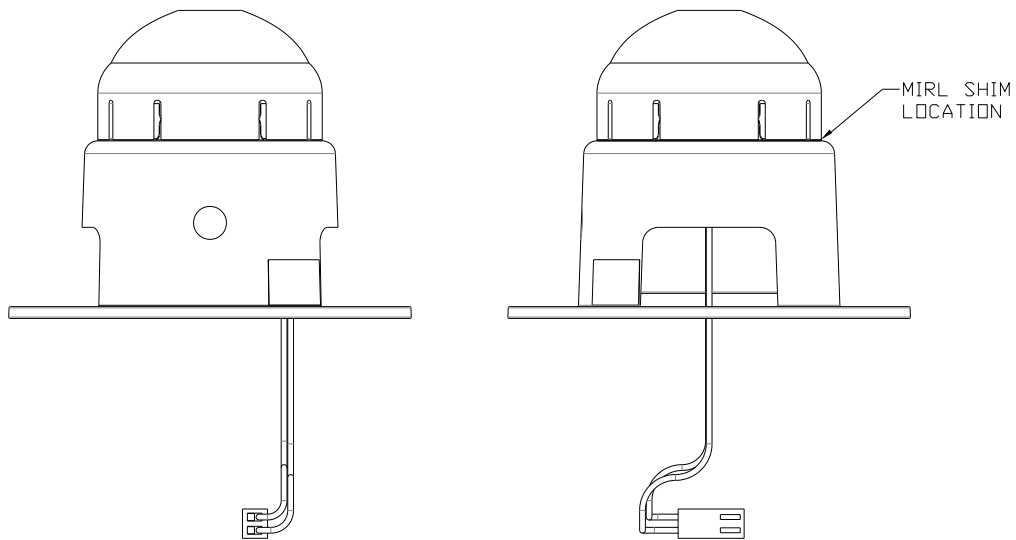
Instruction Manual  
MIRL and MITL,  
AP1 Series



**FIGURE 7A**

**Part Number 50667-1, Omni Blue Assembly**

*Note: the assembly parts are the same for all Omni type versions.*

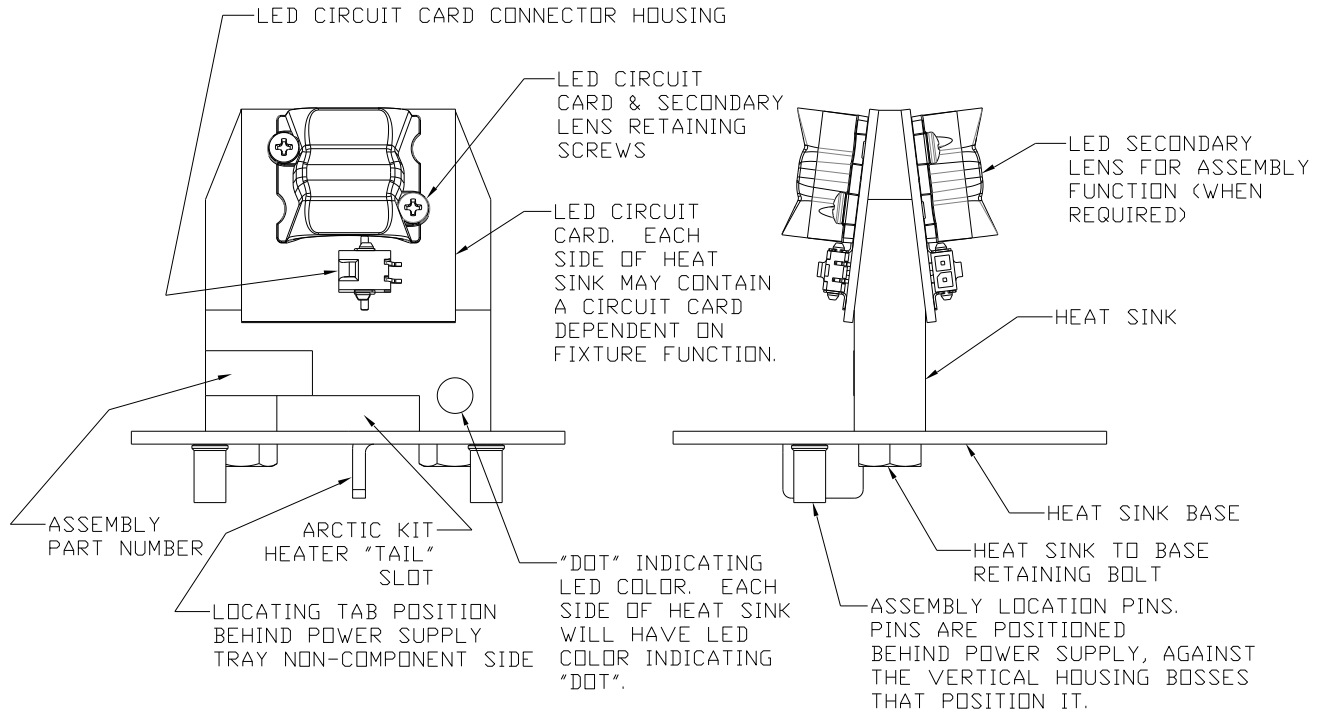


**FIGURE 7B**

**Part Number 50667-2, Omni White, FAA & UFC Assembly**

*Note: the assembly has a shim under the lens. See Figure 7A for other parts identification.*

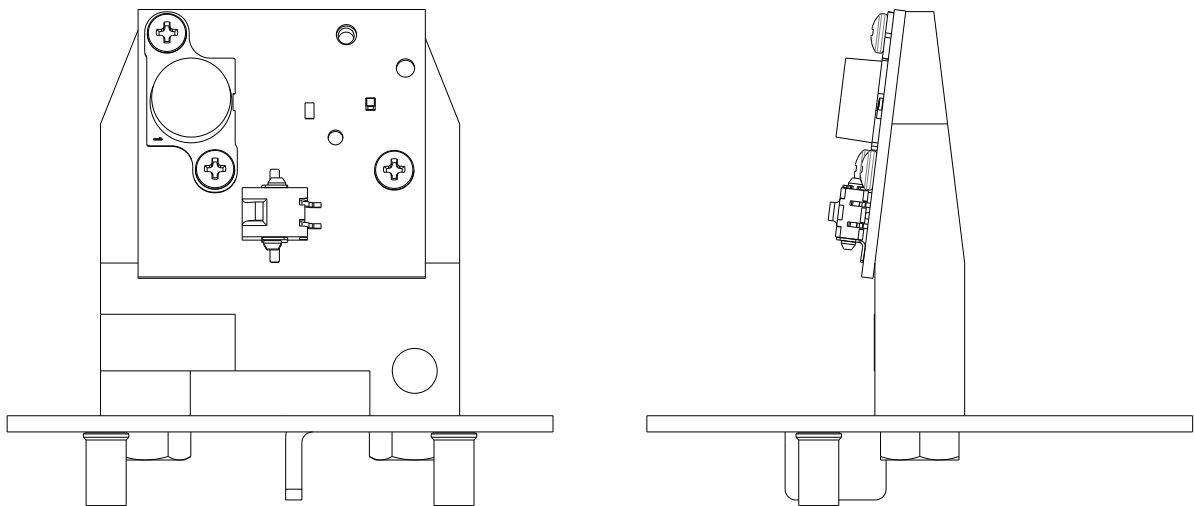
Instruction Manual  
MIRL and MITL,  
AP1 Series



**FIGURE 7C**

**Part Number 50667-3, Bi-Directional L-861Green/Yellow Assembly**

*Note: the assembly parts are the same for all Bi-Directional type versions.*

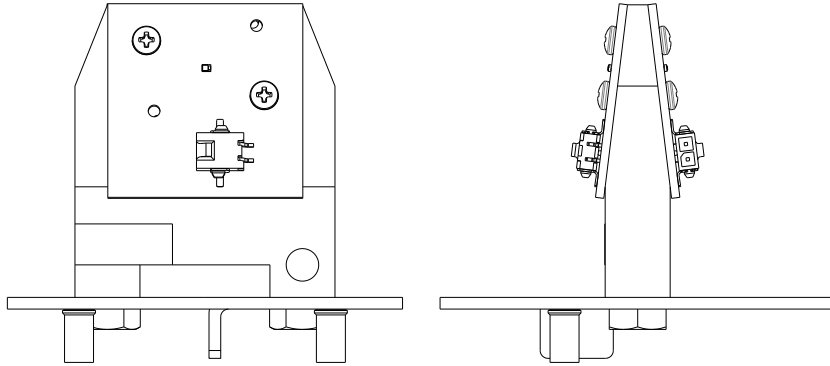


**FIGURE 7D**

**Part Number 50667-4, Bi-Directional L-861E Green/Blank Assembly**

*Note: see Figure 7C for parts identification.*

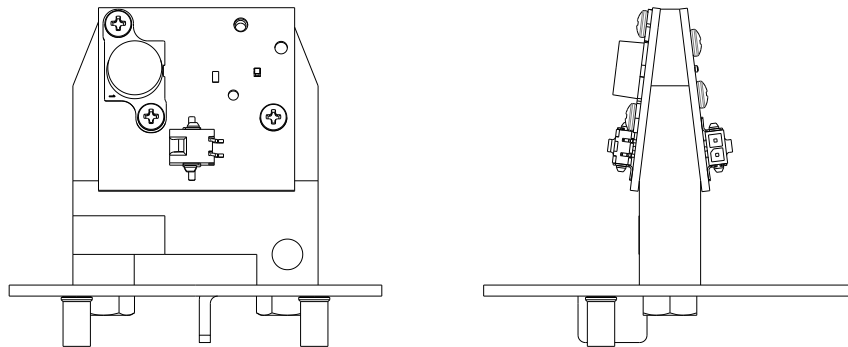
Instruction Manual  
MIRL and MITL,  
AP1 Series



**FIGURE 7E**

**Part Number 50667-5, Bi-Directional L-861E Red/Red Assembly**

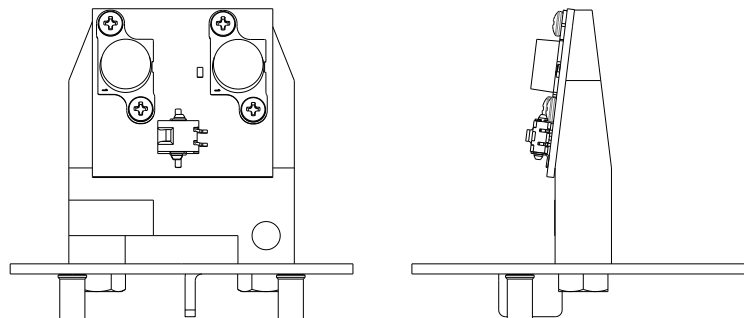
*Note: see Figure 7C for parts identification.*



**FIGURE 7F**

**Part Number 50667-6, Bi-Directional L-861E Green/Red Assembly**

*Note: see Figure 7C for parts identification.*

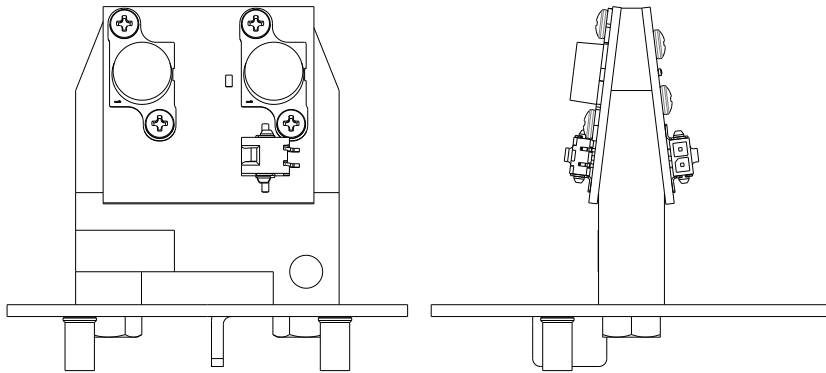


**FIGURE 7G**

**Part Number 50667-7, Bi-Directional L-861SE Green/Blank Assembly**

*Note: see Figure 7C for parts identification.*

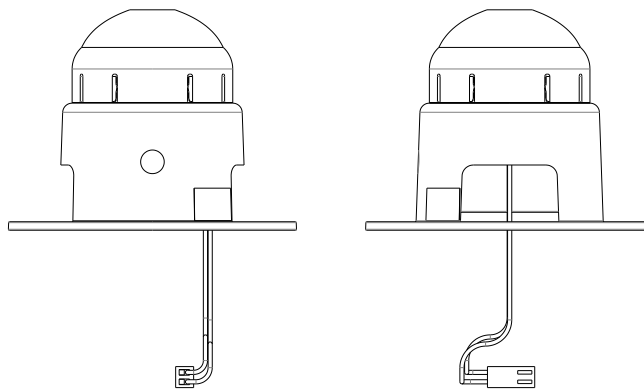
Instruction Manual  
MIRL and MITL,  
AP1 Series



**FIGURE 7H**

**Part Number 50667-8, Bi-Directional L-861SE Green/Red Assembly**

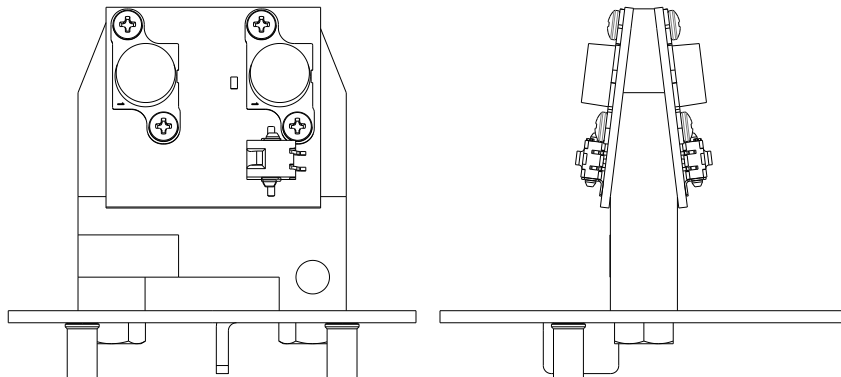
*Note: see Figure 7C for parts identification.*



**FIGURE 7I**

**Part Number 50667-9, Omni White, TP312 Assembly**

*Note: the assembly has a shim under the lens. See Figure 7A for other parts identification.*



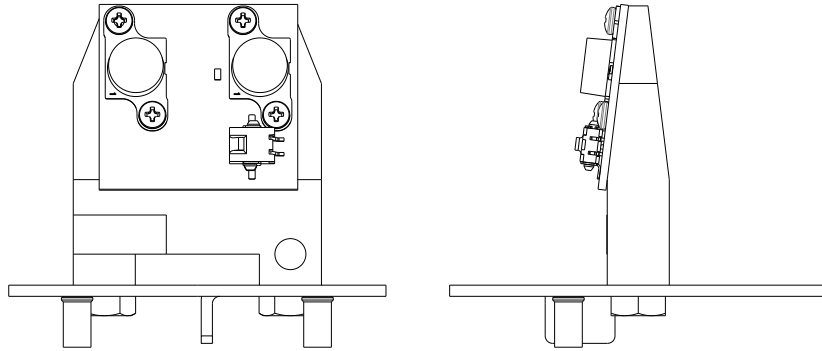
**FIGURE 7J**

**Part Number 50667-10, Bi-Directional TP312 Green/Red Assembly**

*Note: see Figure 7C for parts identification.*

Instruction Manual  
MIRL and MITL,  
AP1 Series

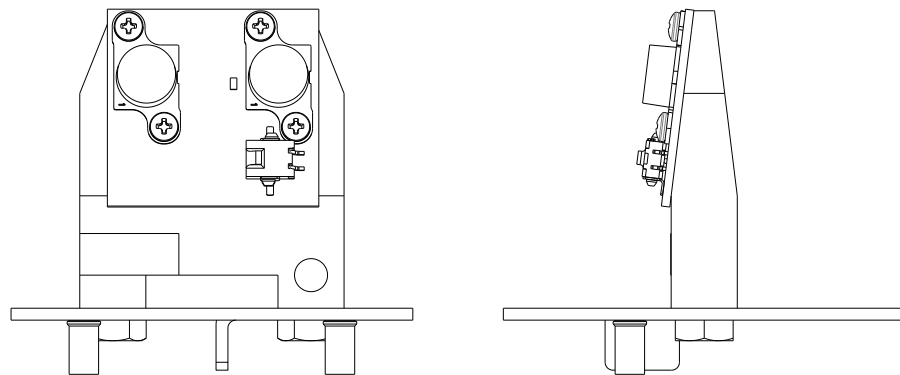
**FIGURE 7K**



**FIGURE 7L**

**Part Number 50667-13, Bi-Directional TP312 Green/Blank Assembly**

*Note: see Figure 7C for parts identification.*

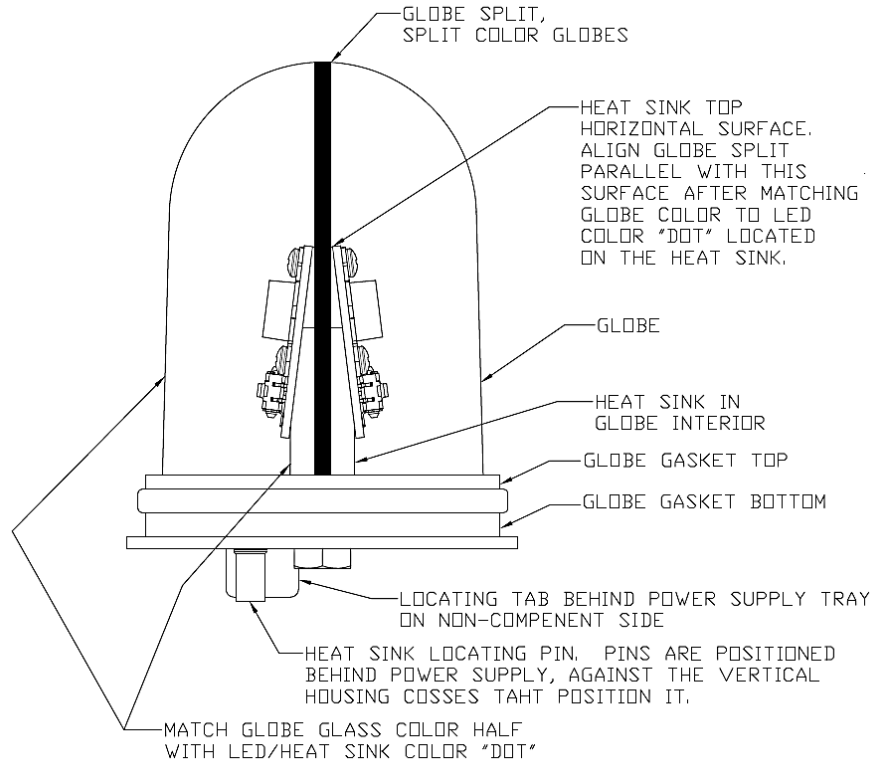


**FIGURE 7M**

**Part Number 50667-14, Bi-Directional TP312 Red/Blank Assembly**

*Note: see Figure 7C for parts identification.*

Instruction Manual  
MIRL and MITL,  
AP1 Series



**FIGURE 7N**

**Split Globe Alignment on Bi-Directional LED/Heat Sink Assembly**  
*Reference Sections 8.5, 8.6, 8.9 and 8.10*

Instruction Manual  
MIRL and MITL,  
API Series

FAA MITL Recognized/ETL Certified Fixture Type & Color*							
Type	Light Direction & Colors		Eaton Part Number	LED/ Heatsink Replacement P/N/Figure Number	Wattage (VA)	Power Supply J203 Jumper Setting	Globe Part Number
L-861T	Omni-directional:	Blue	861T-AP1-BA-_-_-_-	50667-1/Figure 7A	6.225	No Jumpers	50613-B
*Frangible column-3(2" BSPP) and Arctic Kits -2 or -3(External Cord) are not ETL Certified. Note: Arctic Kits (heater) adds 16 watts (VA) additional when used.							
ICAO, NATO STANAG 3316, Canada TP312E, U.S. Military UFC 3-535-01, U.S. Navy Navair 51-50AAA-2 MITL FIXTURE TYPE & Color							
Type	Light Direction & Colors		Eaton Part Number	LED/ Heatsink Replacement P/N/Figure Number	Wattage (VA)	Power Supply J203 Jumper Setting	Globe Part Number
Taxiway	Omni-directional:	Blue	861T-AP1-BC-_-_-_-	50667-1/Figure 7A	8.15	Figure 6C	50613-B
Note : Arctic Kits (heater) adds 16 watts (VA) additional when used.							
FAA MIRL Recognized/ETL Certified Fixture Type & Color combinations*							
Type	Light Direction & Colors		Eaton Part Number	LED/ Heatsink Replacement P/N/Figure Number	Wattage (VA)	Power Supply J203 Jumper Setting	Globe Part Number
L-861	Omni-directional:	White	861M-AP1-WM-_-_-_-	50667-2/ Figure 7B	10.85	Figure 6A	50613-W
		Yellow	861M-AP1-YM-_-_-_-	50667-2/ Figure 7B	10.85	Figure 6A	50613-Y(1)
	Bi-directional:	White/Yellow	861B-AP1-WY-_-_-_-	50667-2/ Figure 7B	10.85	Figure 6A	50613-W/Y(1)
		White/Red	861B-AP1-WR-_-_-_-	50667-2/ Figure 7B	10.85	Figure 6A	50613-W/R(1)
		Yellow/Red	861B-AP1-YR-_-_-_-	50667-2/ Figure 7B	10.85	Figure 6A	50613-Y(1)/R(1)
L-861E	Bi-directional:	Green/Yellow	861B-AP1-GY-_-_-_-	50667-3/ Figure 7C	11.39	Figure 6A	50613-G/Y
		Green/Red	861E-AP1-GR-_-_-_-	50667-6/ Figure 7F	8.10	Figure 6A	50613-G/R
	Uni-directional:	Red/Red	861E-AP1-RR-_-_-_-	50667-5/ Figure 7E	7.60	Figure 6A	50613-R
		Green(Green/Blank)	861E-AP1-GN-_-_-_-	50667-4/ Figure 7D	6.80	Figure 6A	50613-G/X
L-861SE	Bi-directional:	Green/Red	861S-AP1-GR-_-_-_-	50667-8/ Figure 7H	13.82	Figure 6A	50613-G/R
	Uni-directional:	Green(Green/Blank)	861S-AP1-GN-_-_-_-	50667-7/ Figure 7G	11.48	Figure 6A	50613-G/X
*Frangible column-3(2" BSPP) and Arctic Kits -2 or -3(External Cord) are not ETL Certified. Note: Arctic Kits (heater) adds 16 watts (VA) additional when used.							

UFC MIRL Compliant Fixture Type & Color Combinations							
Application	Light Direction & Colors		Eaton Part Number	LED/ Heatsink Replacement P/N/Figure Number	Wattage (VA)	Power Supply J203 Jumper Setting	Globe Part Number
Runway	Omni-directional:	White	861M-AP1-UW-_-_-_-	50667-2/Figure 7B	13.19	Figure 6B	50613-W
		Yellow	861M-AP1-UY-_-_-_-	50667-2/ Figure 7B	13.19	Figure 6B	50613-Y(1)
	Bi-directional:	White/Yellow	861B-AP1-UF-_-_-_-	50667-2/ Figure 7B	13.19	Figure 6B	50613-W/Y(1)
Note: Arctic Kits (heater) adds 16 watts (VA) additional when used.							

TP312 MIRL Compliant Fixture Type & Color Combinations							
Application	Light Direction & Colors		Eaton Part Number	LED/ Heatsink Replacement P/N/Figure Number	Wattage (VA)	Power Supply J203 Jumper Setting	Globe Part Number
Runway	Omni-directional:	White	312M-AP1-WM-_-_-_-	50667-9/ Figure 7I	10.85	Figure 6A	50613-W
		Yellow	312M-AP1-YM-_-_-_-	50667-9/ Figure 7I	10.85	Figure 6A	50613-Y(1)
	Bi-directional:	White/Yellow	312B-AP1-WY-_-_-_-	50667-9/ Figure 7I	10.85	Figure 6A	50613-W/Y(1)
		White/Red	312B-AP1-WR-_-_-_-	50667-9/ Figure 7I	10.85	Figure 6A	50613-W/R(1)
		Red/Yellow	312B-AP1-RY-_-_-_-	50667-9/ Figure 7I	10.85	Figure 6A	50613-Y(1)/R(1)
Threshold	Bi-directional:	Green/Red	312E-AP1-GR-_-_-_-	50667-10/ Figure 7J	13.54	Figure 6B	50613-G/R
Threshold/Wingbar	Uni-directional:	Green(Green/Blank)	312E-AP1-GN-_-_-_-	50667-13/ Figure 7L	9.90	Figure 6B	50613-G/X
End	Uni-directional:	Red (Red/Blank)	312E-AP1-RN-_-_-_-	50667-14/ Figure 7M	8.64	Figure 6B	50613-R/X
Note: Arctic Kits (heater) adds 16 watts (VA) additional when used.							

**TABLE 7**

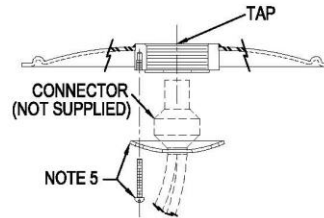
**LED/ Heat Assembly and Globe Part Numbers and Fixture Wattage**  
Note, white color globes are clear and blank color globes are opaque black.

Instruction Manual  
MIRL and MITL,  
AP1 Series

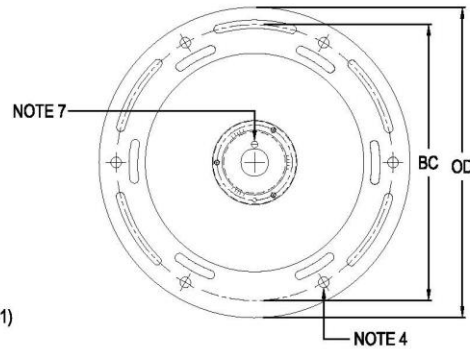


L-867 Corten Base Plate

**L-867  
Corten  
Base Plate**



1. Approved and Certified to FAA Advisory Circular AC 150/5345-46  
Size: B=12", D=16"
2. Material: Corten A606 steel
3. Finish: Aviation yellow powder coat
4. (6) 7/16"  $\varnothing$  equally spaced, thru holes
5. Base plate shipped with:  
Neoprene gasket:  
AP1932/1935 12" (10530287)  
AP2932/2935 16" (10530281)  
Foam gasket:  
AP1932AK/AP1935AK 12" (10532042)  
Hardware packup #6120 which contains:  
(1) 3 hole cable clamp (8089)  
(3) #10-24 x 1 1/2" SS machine screws (10670781)
6. Grounded version available (see p.K-01f)  
Add "G" suffix to part number
7. (1) 1/4"  $\varnothing$  Weep Hole Standard  
Add "AK" suffix to P/N for baseplate w/o weep hole,  
Foam Gasket & 6120 pack up (Alaskan Application)
8. Other thread types available (e.g. 2"-11 BSP)



TYPE	OD	BC	TAP
<b>AP1932</b>	12"	10.25"	2" NPS
12" L867B	[304.8]	[260.4]	[50.8]
<b>AP1935</b>	12"	10.25"	1 1/2"-12 NF
12" L867B	[304.8]	[260.4]	[38.1]
<b>AP2932</b>	16"	14.25"	2" NPS
16" L867D	[406.4]	[362]	[50.8]
<b>AP2935</b>	16"	14.25"	1 1/2"-12 NF
16" L867D	[406.4]	[362]	[38.1]

[ ] = dimensions in metrics; mm.

**C-01f (rev 1)**

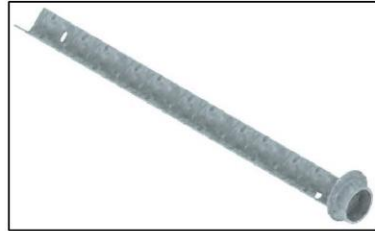
**ACCESSORY A**

**Recommended Base Plates**

The above 12 inch (304.8 mm) base plates for FAA L-867 Size B bases are available from Crouse-Hinds Airport Lighting. The note 8. 12 inch base plate part number is AP1932BSP. Check with Crouse-hinds Airport Lighting for the availability of all 16 inch (406.4 mm) versions for FAA L-867 Size D bases.



Instruction Manual  
MIRL and MITL,  
AP1 Series

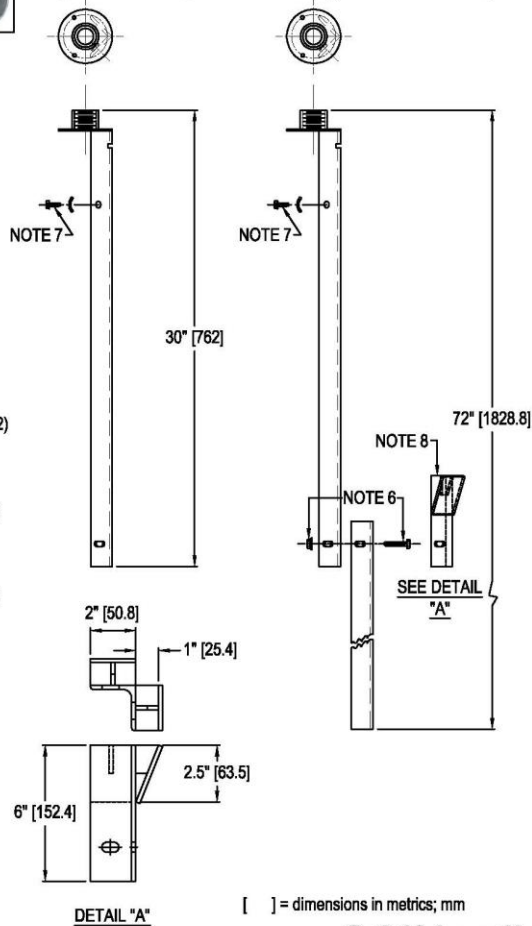


Mounting Stake

## Mounting Stake

(AW2205 - 1 1/2")  
(AW2202 - 2")

(AW2205AH - 1 1/2")  
(AW2202AH - 2")



[ ] = dimensions in metric; mm

**G-04f (rev 1)**

1. Approved and Certified to FAA Advisory Circular AC-150/5345-46 By Light Manufacturers
2. Mounting stakes are galvanized to ASTM-A123/A123M-02
3. AW2202AH and AW2205AH meet Canadian requirements
4. Threads are clean and uncoated
5. Shipped with:  
Hardware packup #6119 which contains:  
(1) 2 hole cable clamp (8094)  
(2) #10-24 x 1 3/4" SS machine screws (10661012)
6. For AW2202AH and AW2205AH  
Additional hardware packup includes:  
(2) 3/8"-16 x 1 1/4" SS hex head bolts (10650202)  
(2) 3/8"-16 Wiz Lock Nuts (10681784)  
**Note:** When pullout tangs are ordered, stakes are shipped with:  
(2) 3/8"-16 x 1 1/2" SS hex head bolts (10650205)
7. OPTIONAL:  
(1) Ground clip (AW0923) with  
(1) 1/4"-20 x 3/4" self tapping screw (10662047)
8. Canadian Pullout Tangs

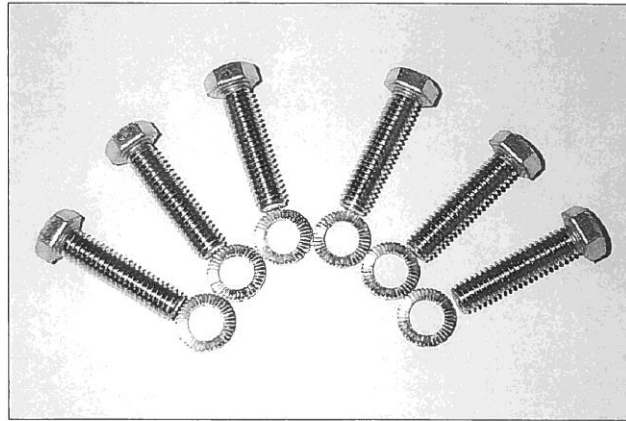
### ACCESSORY B Mounting Stakes

*The above mounting stakes, AW2205 and AW2202 are available from Crouse-Hinds Airport Lighting. Check with Crouse-hinds Airport Lighting for the availability of other versions.*

Instruction Manual  
MIRL and MITL,  
AP1 Series



**BOLT SET WITH LOCKWASHERS  
(STAINLESS STEEL)**



TYPICAL BOLT SET WITH LOCKWASHERS

1. Bolt sets comply with the requirements of FAA Advisory Circular 150/5345-42F
2. All bolts are fully threaded 3/8-16 Hex Head Cap Screws.
3. Lockwashers are 2-piece "wedge-locking" style glued together in pairs for ease of installation.
4. Material for the bolts is grade 304 Stainless Steel
5. Material for the lockwashers is grade 316 Stainless Steel
6. Bolt sets come packed (6) in a plastic envelope with an installation instruction sheet enclosed.

BOLT SET PART NUMBERS	
JACQUITH PART NUMBER	BOLT LENGTH
6100	1" [25.4]
6101	1 1/4" [31.7]
6102	1 1/2" [38.1]
6103	1 3/4" [44.4]
6104	2" [50.8]
6105	2 1/4" [57.1]
6106	2 1/2" [63.5]
6107	2 3/4" [69.8]
6108	3" [76.2]
6109	3 1/2" [88.9]
6110	5" [127.0]
6111	4" [101.6]
6130	6" [152.4]

[ ] = dimensions in metric; mm

**J-06f (rev 1)**

**ACCESSORY C**

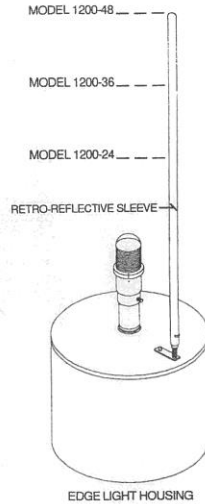
**Bolt Kits, Base Plate to Base**

*These base plate to FAA L-867 base attachment bolts are available from Crouse-Hinds Airport Lighting. Base surfaces and their mounting holes must be degreased, clean and dry prior to bolt installation. Bolt threads should be fully coated with anti-seize (marine grade preferred) that has a K factor (torque coefficient) of 0.18. These bolts can then be torqued (do not use impact wrenches) to 225 in-lbs – 0, +10% (25.42 -, +10% Nm) in a "star" pattern. Immediately re-torque the bolts in the same "star" pattern. Check torque/re-torque all bolts within 2 weeks of initial installation. Bolt torque should then be checked per a regular maintenance schedule per FAA AC 150/5340-26 (latest recommendations. Note, torque value based on the bolt and washer type in Accessory C, and anti-seize recommended. New bolts and lock washers shall be used each time a base plate is removed from its base.*

Instruction Manual  
MIRL and MITL,  
AP1 Series

**RELM 1200**

**RETRO-REFLECTIVE EDGE LIGHT MARKER (R.E.L.M.)**



The RELM MODEL 1200 has been designed to provide superior visibility, day or night, to all types of Airport/Heliport Edge Lights.

The RELM MODEL 1200's very bright, full length, Retro-Reflective fluorescent colour allows extreme daytime visibility.

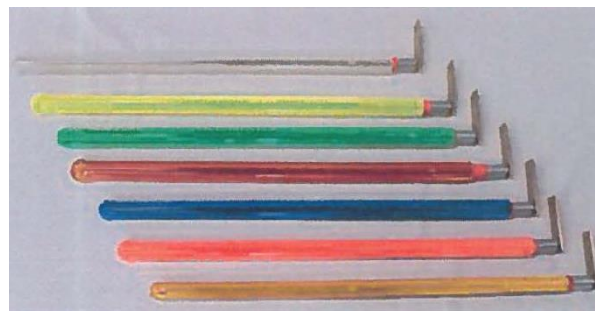
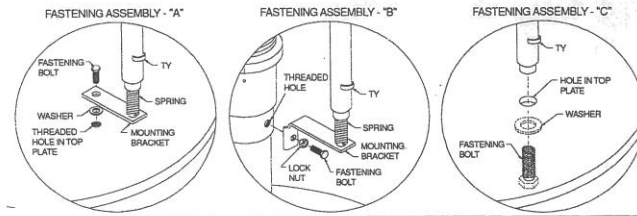
The RELM MODEL 1200's Retro-Reflectiveness quality in night time operation will enable the user clear visibility of each location desired at extreme distances.

Whether the RELM is used to aid in snow clearing operations or general maintenance duties throughout the airfield, the performance is outstanding.

The RELM's construction consists of a high grade polyurethane tube (orange), spring loaded at the base (fastening assemblies "A" & "B"), and mounted to a rust resistant heavy duty bracket. The bracket can be adapted to any fixture type. The polyurethane tube is covered with a Retro-Reflective fluorescent sleeve which is fastened by means of a through ty to prevent even minimal slippage due to extreme wind velocities or jet blasts.

**FEATURES**

- Meets all Aviation Authorities requirements
- Visibility on average 0.5 km, day or night
- Remains flexible through high/low temperature extremes
- Weatherproof: exposure to ice, snow & rain
- Overall diameter of tube is 25 mm (1")
- All types of mounting brackets are available upon request
- Three models of varying lengths to choose from:
  - Model 1200-48 is 1220 mm (48") long
  - Model 1200-36 is 914 mm (36") long
  - Model 1200-24 is 610 mm (24") long



**ACCESSORY D**

**Retro-Reflective Edge Light Marker**

*This marker can be attached to the MIRL/MITL housing with Fastening Assembly "B". Remove one of the housing leveling bolts, and insert it through the marker bracket. Tighten this bolt fully against the bracket to the housing column until the marker bracket is bottomed-out against the housing. Torque this leveling bolt **first** to 80 in.-lb.s, +/- 5 in.-lbs (9.04 +/- .565 Nm), then level the fixture with the remaining housing leveling bolts per Section 7.j., k. l. The retro-reflective sleeve comes in many different colors. Check with Crouse-Hinds Airport Lighting for color and length availability. It is the sole responsibility of the end user to maintain adequate clearances for aircraft when using these markers. The housing leveling bolts are approximately 3 inches (76.2 mm) up from the fixture frangible shoulder where the marker bracket would attach.*