

## INSTALLATION MANUAL

# MicroMax

## AVE-MMACS-IM

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## Part 0 Document Administration

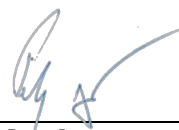
### 0.1 Document Approval

This document has been established in accordance with an alternative procedure to DOA approved under EASA AP429.

This installation manual is applicable for following part numbers:

- **MicroMax Red** - AVE-MMACSR-ENA
- **MicroMax White** - AVE-MMACSW-ENA
- **MicroMax Green** - AVE-MMACSG-ENA
- **MicroMax Amber** - AVE-MMACSA-ENA

Compiled by: \_\_\_\_\_ 04 August 2021



Petr Jaros  
Engineer, Aveo Engineering Group, s.r.o.

Approved by: \_\_\_\_\_ 04 August 2021

Georg Hartl  
Head of DO, Aveo Engineering Group, s.r.o.

## 0.2 Amendment Record Procedure

The master copy of this document shall be kept electronically as a read only document under the control of Aveo Engineering Group, s.r.o. as Master Copy.

**ALL** amendments to this manual will initiate a raise of issue.

The original issue will be identified by "**01**", and subsequent issues will be numbered sequentially from 02 to 99 in Table 01 - **Issue No.** column.

**ALL** issues of this document will be approved by Head of DO.

Issue No.	Details	Date of issue	Effected Pages
01	Initial Issue	04 Aug 2021	ALL
<b>Table 01: Record of Document Amendments</b>			

## 0.3 Effected Pages Procedure

ALL pages affected by ANY raise of issue of this manual will be listed in Table 01 - **Effected Pages** Column.

The reason(s) for **EACH** raise of issue and the description of respective change will be provided in Table 01 - **Details** Column.

Changes from the previous issue are shown as follows:

- a) new text is highlighted with yellow shading: **new**
- b) deleted text is shown with yellow shading and a strike through: ~~deleted~~

## Part 1 Installation data

### 1.1 MicroMax™

**MicroMax™** is a beacon light and weighing no more than 30 grams, will help you comply with all the tightening and future regulations around operating small UAVs/MiniDrones and ensure SAFETY is included in your flight operations. Available in Red or White, the patented MicroMax™ provides a 360 degree arc of coverage.

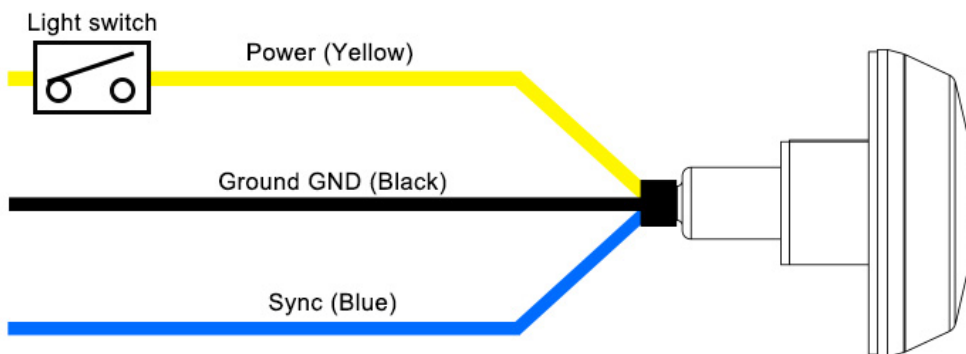
- **MicroMax Red** - AVE-MMACSR-ENA
- **MicroMax White** - AVE-MMACSW-ENA
- **MicroMax Green** - AVE-MMACSG-ENA
- **MicroMax Amber** - AVE-MMACSA-ENA

### 1.2 Operating Instructions

When installed on the aircraft, using the aircraft's power (14 or 28 volts), the light will be at its maximum intensity.

*Operating Voltage range is +9..+32VDC*

### 1.3 Installation Schematic / Wiring Diagram



### 1.4 Control & Power Inputs

- Yellow** - AWG22 - power input
- Black** - AWG22 - power return
- Blue** - AWG22 - sync.

Teflon insulation, 600V

Wire length from base of unit 10" inch min

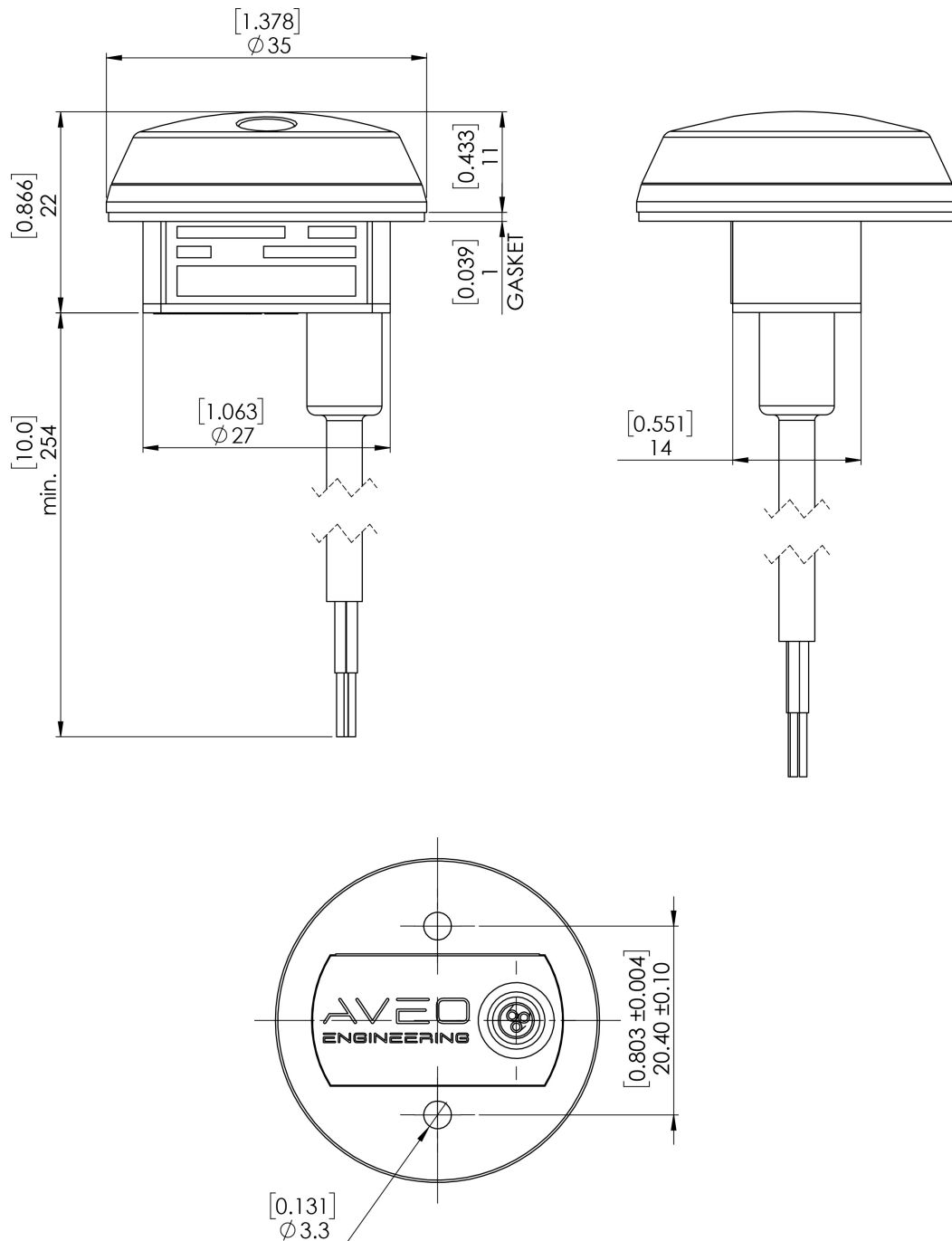
## **1.5 Technical Specification**

<b>Dimensions – above surface (mm):</b>	35 mm x 11 mm
<b>Dimensions – above surface (inches):</b>	1.378" x 0.433"
<b>Weight:</b>	30 g / 1.05 oz max
<b>Operating voltage range:</b>	9-32 V DC
<b>Input power:</b> - Red - White - Green - Amber	5.4W (peak) 7.8W (peak) 7.8W (peak) 7.8W (peak)
<b>Input current:</b> - Red  - White  - Green  - Amber	0.39A @14V (peak) 0.19A @28V (peak) 0.56A @14V (peak) 0.28A @28V (peak) 0.56A @14V (peak) 0.28A @28V (peak) 0.56A @14V (peak) 0.28A @28V (peak)
<b>Repetition rate of strobe:</b>	50 cycles per minute
<b>Ambient temperature:</b>	from -40°C to +85°C from -40°F to +185°F
<b>Overheat protection:</b>	Yes
<b>Recommended size of mounting screw:</b>	M3
<b>Reverse polarity protection:</b>	Yes
<b>Over-Voltage spike protection:</b>	60V / 1s
<b>Under-Voltage protection:</b>	Yes, 8.5V
<b>Over-Voltage protection:</b>	Yes, 33V
<b>Waterproof, Dust-proof, Vibration-proof:</b>	Yes

**MicroMax lights are designed, manufactured and tested to meet minimum RTCA DO-160 requirements:**

<b>Environment</b>	<b>Section</b>	<b>Category</b>
Temperature / Altitude	4	C2
Temperature Variation	5	A
Humidity	6	C
Operational Shock	7	A
Vibration	8	S, Curve M
Waterproofness	10	S
Waterproofness	10	S
Fluids Susceptibility	11	F
Sand and dust	12	D
Fungus	13	F
Salt Fog	14	T
Magnetics Effects	15	Z
Power Input	16	BXX
Voltage Spike	17	B
Audio Freq. Conducted Susceptibility	18	B
Induced Signal Susceptibility	19	AC
Radiated and Conducted Susceptibility	20	T
Radiated and Conducted Emissions	21	B
Lightning Induced Transient Susceptibility	22	A2E2X
Icing	24	A
Electrostatic Discharge	25	A

## 1.6 Technical Drawing

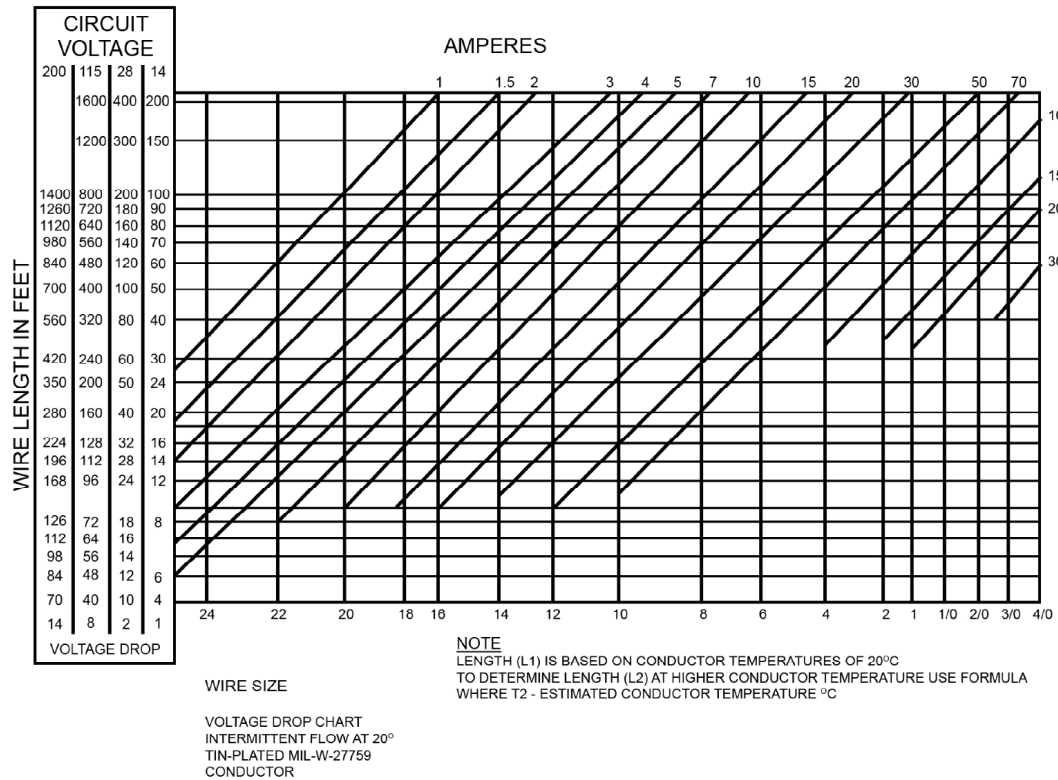


*\*dimensions in [inches] / mm*



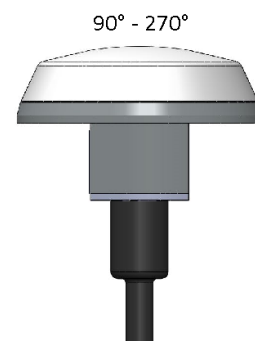
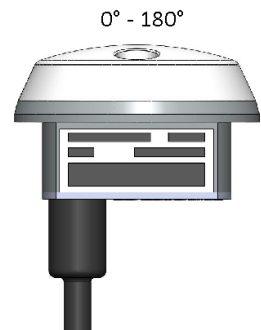
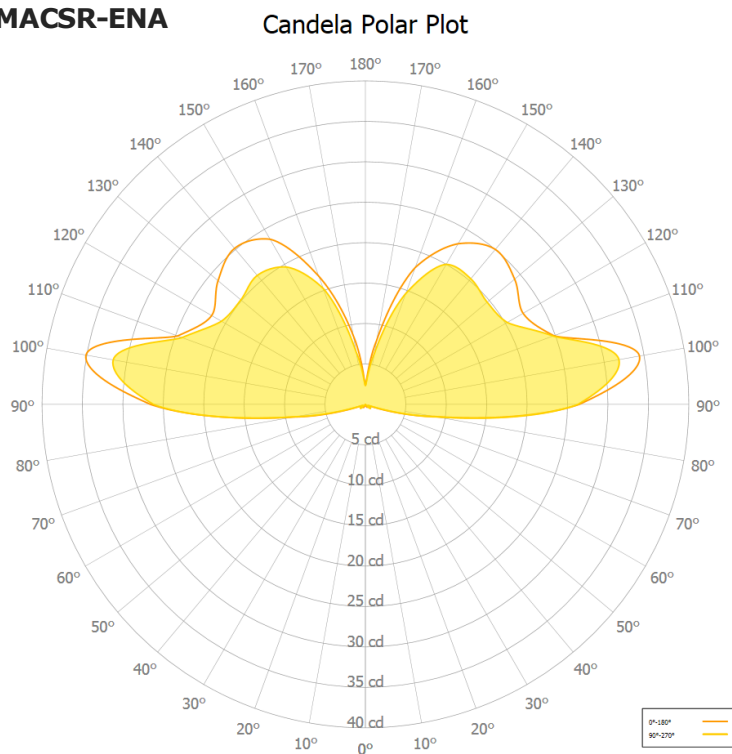
## 1.7 Wiring Chart

Use diagram below defining the wiring size depending on the current and the wire length. Make sure you add up the current for all connected lights. If current is not given, then divide the power by the voltage.

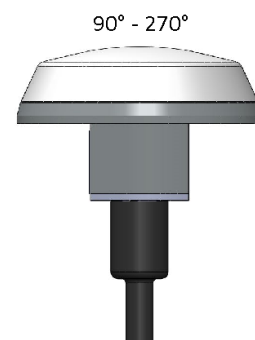
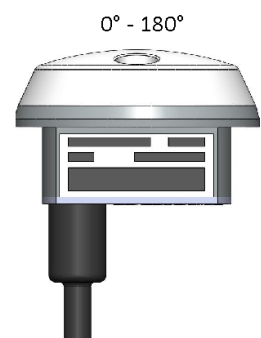
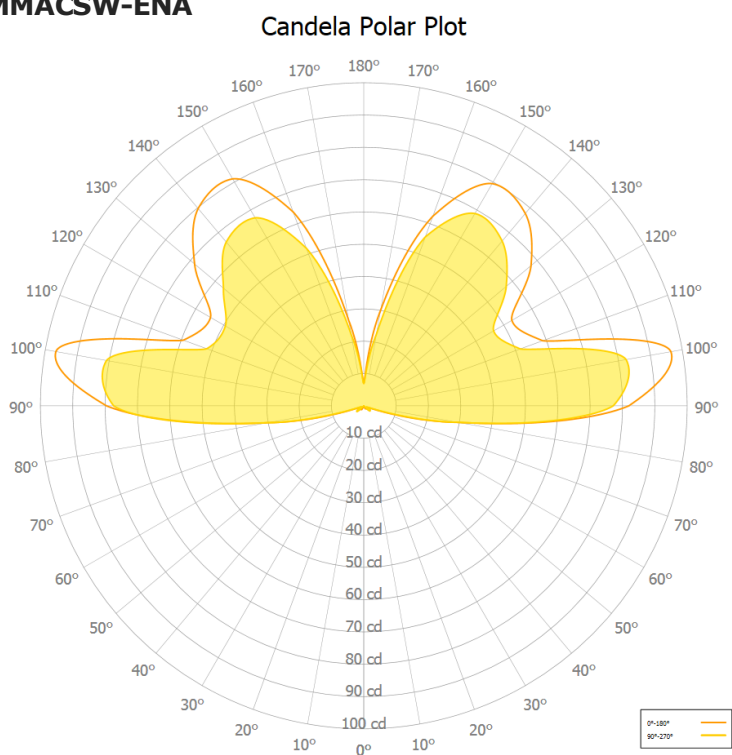


## 1.8 Optic Simulation

### MicroMax Red AVE-MMACSR-ENA

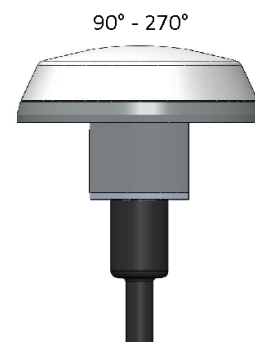
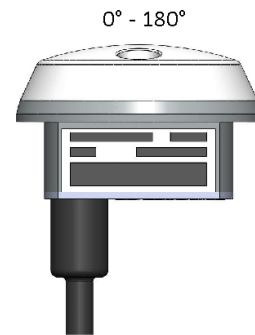
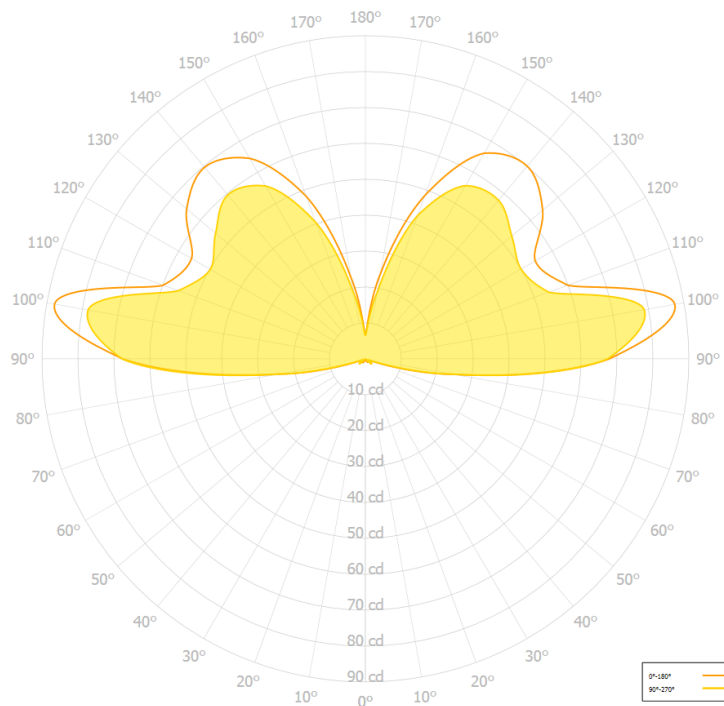


### MicroMax White AVE-MMACSW-ENA



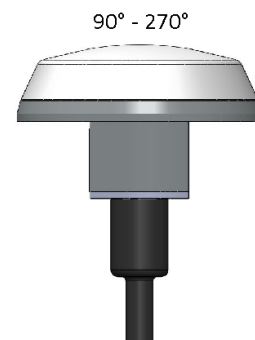
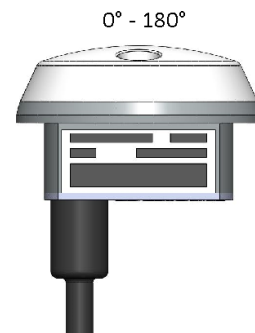
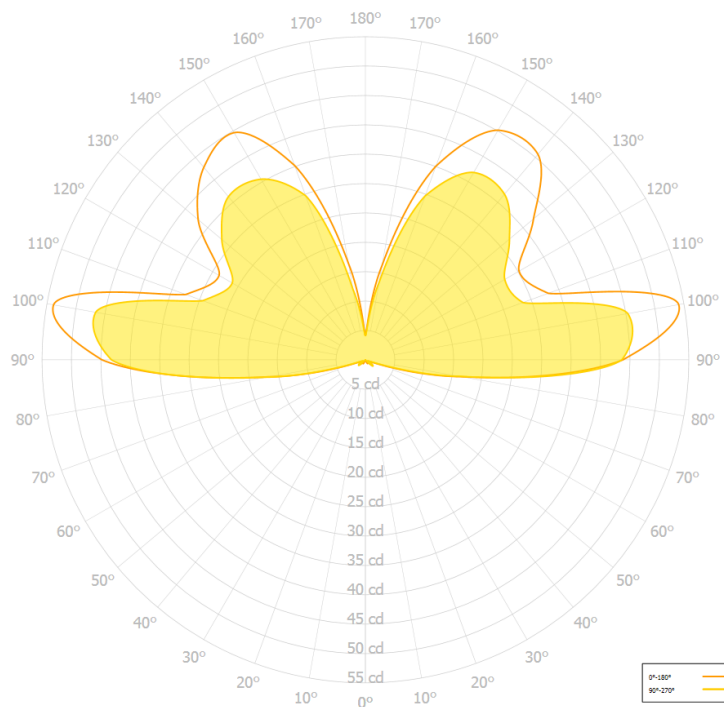
**MicroMax Green**  
**AVE-MMACSG-ENA**

**Candela Polar Plot**



**MicroMax Amber**  
**AVE-MMACSA-ENA**

**Candela Polar Plot**



## **1.9 Equipment Limitation**

**MicroMax** should only be powered by +9..+32 V DC

## **1.10 Care and Cleaning of Lights**

Aveo Engineering Aviation Lights are factory polished and delivered as ready to install on the aircraft.

If the lights need a deeper cleaning, they should be polished with a quality lamb's wool sheet that is suitable also for deeper polishing. Under no circumstances should any petroleum based product be used to clean the lights.

## **1.11 Testing the Lights before Installation**

All Aveo Aviation lights undergo rigorous testing prior to being released from our engineering manufacturing department. This testing involves a burn-in time as well as other function testing. No light is released for sale without undergoing this extensive operational testing.

When you receive the **MicroMax** light, and wish to test the function of the light prior to installation on your aircraft, please note the following:

1. Please review the written information that is enclosed in the packaging. Warranty information as well as a cautionary note about power supply removal is enclosed with each package.
2. Remove the light from the package.  
Note that there are three (3) wires:
  - Yellow - AWG22 - power input
  - Black - AWG22 - power return
  - Blue - AWG22 - sync
3. Testing of the function of the light can be done with a regular 14VDC or 28VDC power supply (not a battery charger).

Connect the ground wire to black wire and then connect the power wire to yellow wire. The MicroMax light should start lighting. When installed on the aircraft, using the aircraft's power (14 or 28 VDC), the light will be at its maximum intensity.

After testing, the light can be installed on the aircraft.

### **IMPORTANT NOTES:**

Under no circumstances should any power supply other than a +9..+32 V DC, or a 14 / 28 volt battery be used to test the light. Do not use: Battery chargers, battery back-up power devices, or other bench avionics testing methods to test the aviation light. The light is functional between 9-32 volts. Use of a battery charger or other power unit to test the light will void the warranty and may damage the light.

If you have any questions about the installation of the lights, please refer to our web site: [www.aveoengineering.com](http://www.aveoengineering.com)

## **1.12 Continued Airworthiness Information**

### **Circuit/Wiring Protection**

Each MicroMax series light features a **Negative Temperature Coefficient** (NTC) circuit that limits internal temperatures by attenuating operating current (with a corresponding reduction of brightness) when internal temperatures reach a certain threshold. This proprietary circuitry serves to protect the light itself, and associated aircraft wiring, against a thermal runaway condition.

## **1.13 RoHS Compliance Statement**

### **Scope**

This statement clarifies Aveo Engineering's compliance with European Union Directive 2015/863/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment ("RoHS") that took effect on June 4, 2015. The RoHS Directive restricts the sale of electronic equipment containing certain hazardous substances in the European Union including:

Cadmium(Cd): 0.01%  
Mercury: 0.1%  
Lead(Pb): 0.1%  
Hexavalent chromium (Cr6+): 0.1%  
Polybrominated biphenyls (PBB): 0.1 %;  
Polybrominated diphenyl ethers (PBDE): 0.1 %  
Bis(2-Ethylhexyl) phthalate (DEHP): 0.1% (added in 2015);  
Benzyl butyl phthalate (BBP): 0.1% (added in 2015);  
Dibutyl phthalate (DBP): 0.1% (added in 2015);  
Diisobutyl phthalate (DIBP): 0.1% (added in 2015)

### **Compliance**

Aveo Engineering certifies that all products sourced from manufacturing facilities comply with the environmental standards set forth by the Directive 2015/863/EU, recast amendment of RoHS Directive 2011/65/EU Article (4), and do not contain any of the above-mentioned, 10 hazardous substances above the specified limits. All products manufactured by Aveo Engineering are RoHS-compliant. With regards to RoHS-2 CE marking, product packaging is labeled attesting conformity if required.

### **References**

Directive 2015/863/EU of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

### ***1.14 EU REACH Regulation (EC) No. 1907/2006***

Aveo Engineering declares that no chemicals are produced and that none of the chemicals used during the production process or needed for the product maintenance or service, is listed on the current European Chemicals Agency's Candidate list of Substances of Very High Concern for Authorization.