



## Installation Manual

DOC.NO: AVE-RBXP-001-IM

# ***RedBaron Galactica™***

Anti-collision LED Light

© Aveo Engineering Group, s.r.o.  
Drasov 202 , 261 01 Drasov  
Czech Republic  
[www.aveoengineering.com](http://www.aveoengineering.com)

## Part 0 Document Administration

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## 0.2 Document approval

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

This installation manual is according EASA ETSO [Authorization number] and applicable for part numbers AVE-RBXPR-001, AVE-RBXPW-001, **AVE-RBXPR-002**, **AVE-RBXPW-002**.

Compiled by: \_\_\_\_\_ 19. – Jan. - 2017  
 Peter Nezval  
 Engineer, Aveo Engineering Group, s.r.o.

Approved by: \_\_\_\_\_ 19. – Jan. - 2017  
 Georg Hartl  
 Head of DO, Aveo Engineering Group, s.r.o.

## 0.3 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

**ALL** raises of issue will be given a sequential Alphabetic Issue Ident sequentially from 01 to 99 in Table 01 - **Issue No:** Column– Initial Issue of Document will be **“01”**

**ALL** Issues of this document will be approved by Head of DO

Issue No.	Details	Date	Effectuated Pages
01	Initial Issue	18.DEC.2014	ALL
02	Addition of Statement p.3 and Occurrence Reporting p. 11, remove failing LED	14.Jun.2015	3, 11, 12
03	Addition of FAA required statements	10.Nov.2015	7, 9

04	Add description and P/N of RB Mini	19.Jan. 2017	5
	Add wiring diagram		7
	Add dimensions and specifications		8
	Update geometry		10
	Add geometry		11
	Add RB Mini to limitations		12
	Add RB Mini to ETSO Requirement Deviation		14
	Update warranty		15
Amend figure legend figure 2	16		

**Table 01: Document Amendment Record Table**

### 0.4 *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 **ALL** raise of issue and description of change due to raise of issue will be provided for **ALL** raises of issue in Table 01 - **Details** Column.

Changes from the previous issue are highlighted by **YELLOW HIGHLIGHTING** over new content. AND **YELLOW HIGHLIGHTING** AND **CROSSING OUT** of deleted content.

Example (**CROSSING OUT**)

### 0.5 *Distribution List*

As stated in 0.3 above; 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 holders of copies of this Document will be recorded by listing in Table 02 – Distribution List.

Copy holders listed will be issued a copy of this document with sequential copy number as shown in Table 02 – Distribution List

Copy No.	Holder
MASTER	Aveo Engineering Group, s.r.o.

**Table 02: Distribution List**

## Part 1 Introduction

The RedBaron series of anti-collision lights were designed for certified aircraft requirements. They represent the cutting edge in optics design and the use of LED arrays that have been optimized for coverage patterns. The exclusive Aveo Rocky Reflectors™ are what separates these lights from any in the industry, and they have been moulded after exhaustive modelling and testing in our parent company's world class LED-array measurement lab. ([www.strojkovengineering.com](http://www.strojkovengineering.com))

The RedBaron XP Galactica™ version incorporates 40 of the brightest LEDs available in the world today, with chromaticity and intensity compliant to all international aviation and safety standards. The optical performance is incredible, and these are the ideal replacement unit for any anti-collision light system in existence. Come visit us and get a tour of our LED array testing and optimization lab, as there are no such facilities available at ANY of our competition.

The RedBaron XP Galactica™ light feature an exclusive Aveo internal reflection system to achieve the appropriate arcs of intensities, and these lights exceed the requirements by a wide margin. Be Seen, Not Sorry is our mantra, and with the RedBaron XP Galactica™ light your aircraft will be seen farther away than any other lighting system on the market, and all with the exclusive Aveo patented electronic circuitry.

Additionally to the RedBaron XP Galactica there is a smaller version called RedBaron Mini Galactica. This light is virtually the upper half of the RedBaron XP. While the RedBaron XP covers 75° up and down on the vertical plane the RedBaron Mini only covers from the horizontal plane up to 75° up. So the Mini is intended for installations with one upper and one lower light to cover the full spectrum.

### Main Features:

- Popular miniature anti-collision light for certified aircraft requirements
- Extremely lightweight
- 9-36 volt DC input range
- No external power supply or strobe unit
- Light synchronization feature
- Minimum drag profile
- Unmatched circuit technology
- Advanced computer and goniophotometer engineered optics

List of the major components (by part number) that make up the equipment complying with the standards prescribed in TSO.

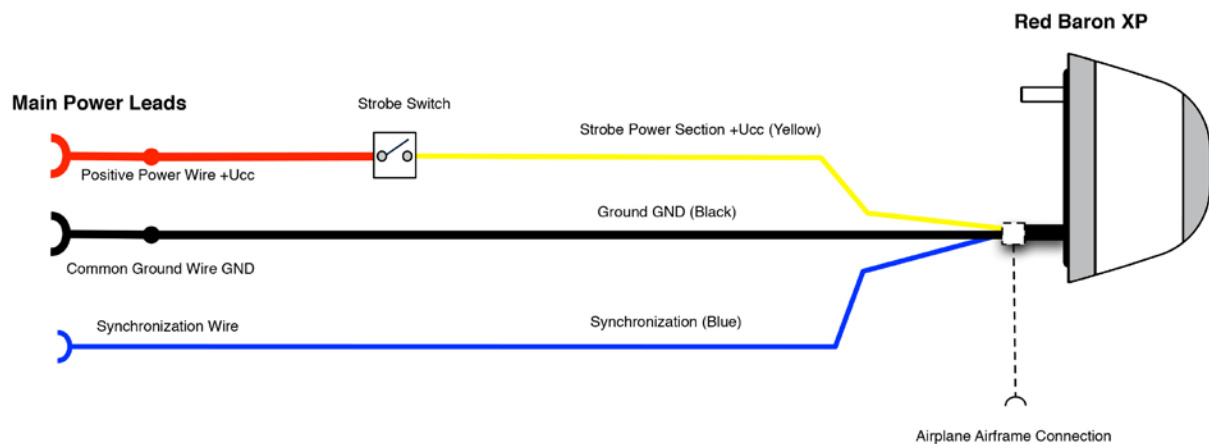
- RedBaron XP Galactica™ anti-collision (RED) ..... PN: AVE-RBXP-001
- RedBaron XP Galactica™ anti-collision (WHITE) ..... PN: AVE-RBXPW-001
- RedBaron Mini Galactica™ anti-collision (RED) ..... PN: AVE-RBXP-002
- RedBaron Mini Galactica™ anti-collision (WHITE) .... PN: AVE-RBXPW-002
- CAP ..... PN: 0100012
- BASE ..... PN: 0100011
- O-RING ..... PN: ISO 3601

## Part 2 OPERATING INSTRUCTIONS

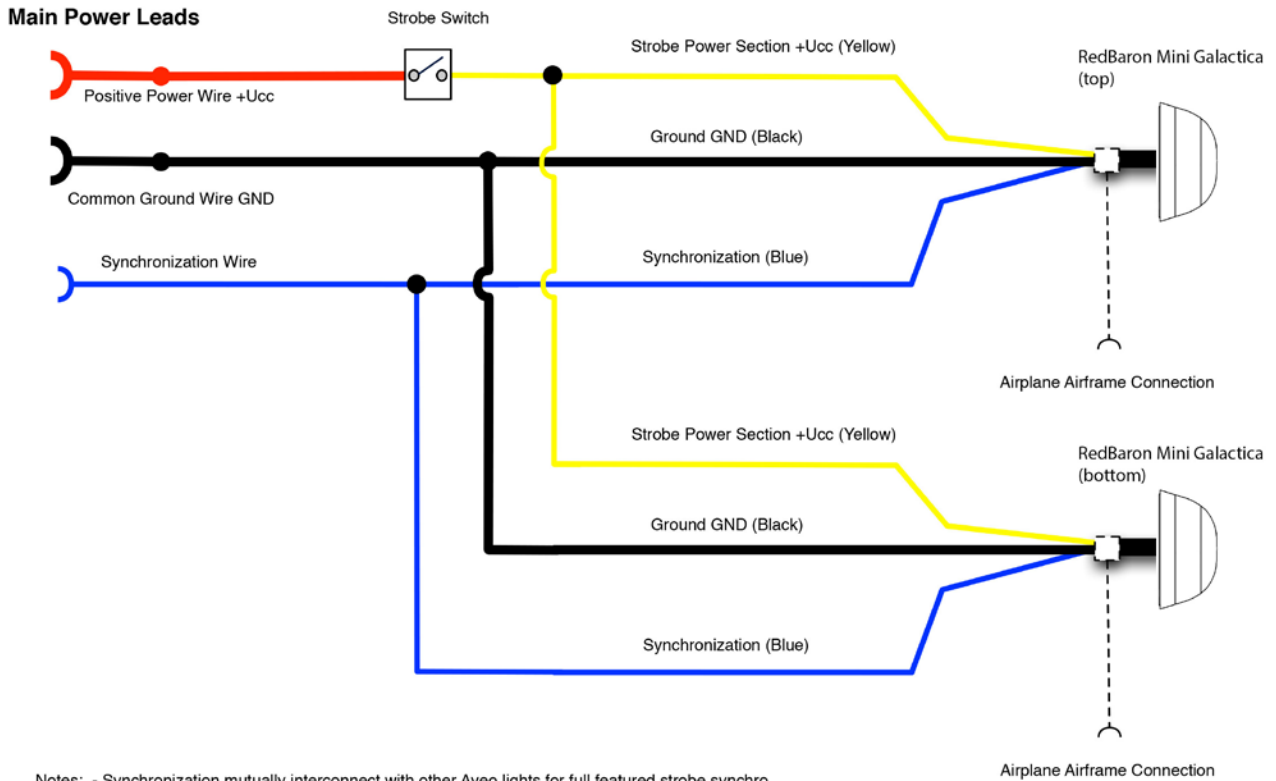
When installed on the aircraft, using the aircraft's power (14 or 28 volts), the light will be at its maximum intensity. (Meet the requirement of **TSO-C96a, Anti-collision Light Systems** and **SAE 8017, "Minimum Performance Standard for Anti-collision Light Systems,"**

## Part 3 Installation

### 3.1 INSTALLATION SCHEMATIC / WIRING DIAGRAM



- Notes: - Synchronization mutually interconnect with other Aveo lights for full featured strobe synchro  
- For installation at non metal surfaces connect earth pigtail to the airframe



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### 3.2 CONTROL & POWER INPUT'S:

- +UCC:** positive strobe power supply line
- GND:** negative common power supply line (ground)
- SYNC:** strobe synchronization line (Mutually interconnect on all installed AveoFlash lights)

### 3.3 TECHNICAL SPECIFICATION

#### 3.3.1 RedBaron XP Galactica

Dimensions:	64 mm x 64 mm x 39.8 mm 2.52" x 2.52" x 1.565"
Weight:	150 g / 5.29 oz
Operating Voltage Range:	9 – 36 Vdc
Power – strobe:	8.8 W (44 W peak)
Current – strobe (@12V):	0.75 A (3.7 A peak)
Repetition Flash Rate of Strobe:	50 cycles per minute
Exceed requirements of:	- ETSO C96a - SAE AS8017a - DO-160F

Recommended size of mounting screw: M5x50mm (AVS-P000102111-A3A) RedBaron XP Galactica or equivalent

#### 3.3.2 RedBaron Mini Galactica

Dimensions:	58 mm x 58 mm x 33.4 mm 2.28" x 2.28" x 1.313"
Weight:	96 g / 3.38 oz
Operating Voltage Range:	9 – 36 Vdc
Power – strobe:	4.4 W (22 W peak)
Current – strobe (@12V):	0.375 A (1.85 A peak)
Repetition Flash Rate of Strobe:	50 cycles per minute
Exceed requirements of:	- ETSO C96a - SAE AS8017a - DO-160F

Recommended size of mounting screw: M5x45mm (AVS-P000100524-A3A) or equivalent

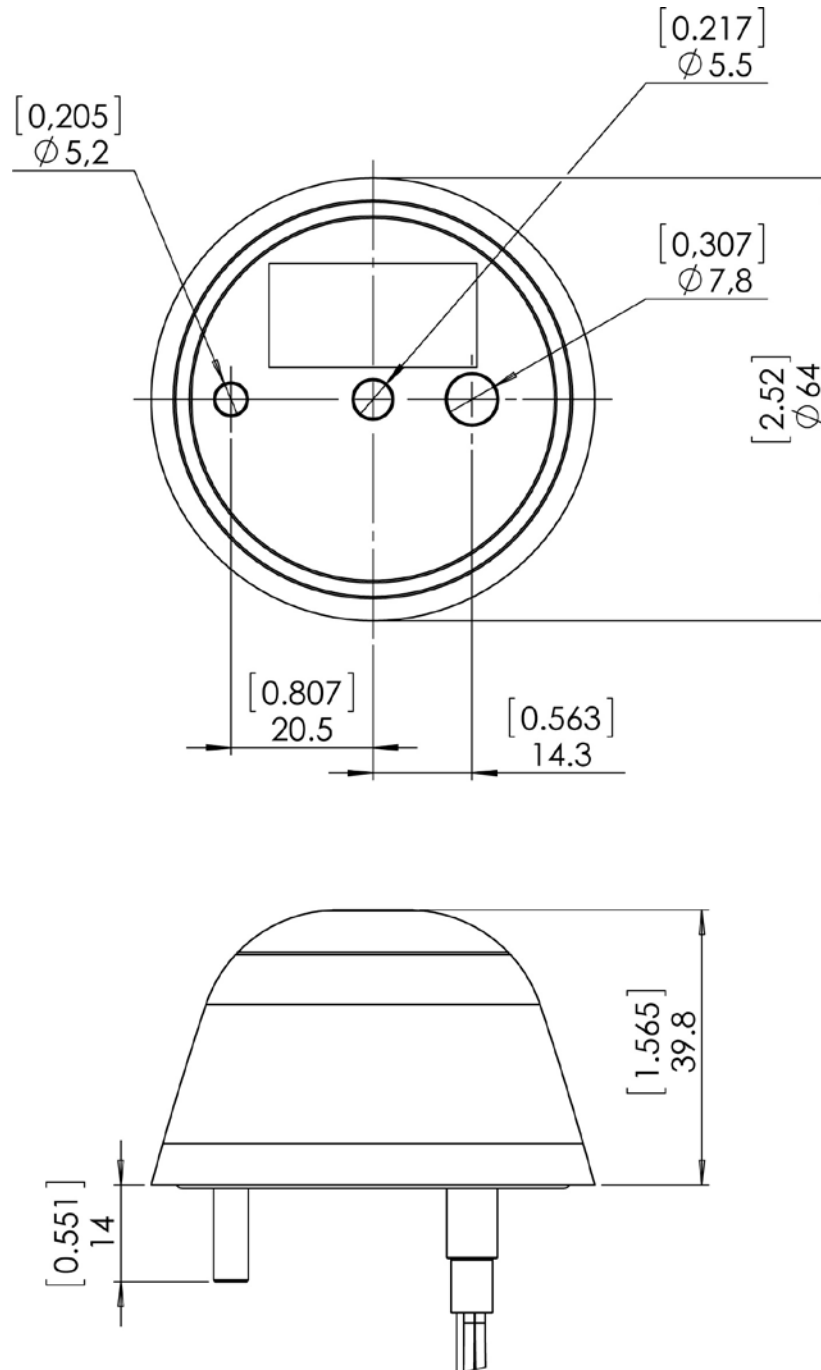


***Summary of Environmental Tests***

Test title	Specification	Section	Category
<b>Temperature / Altitude</b>	<b>DO-160F</b>	<b>4</b>	<b>F2</b>
<b>Temperture variation</b>	<b>DO-160F</b>	<b>5</b>	<b>A</b>
<b>Humidity</b>	<b>DO-160F</b>	<b>6</b>	<b>C</b>
<b>Operational Shock</b>	<b>DO-160F</b>	<b>7</b>	<b>A</b>
<b>Vibration</b>	<b>DO-160F</b>	<b>8</b>	<b>S &amp; R</b>
<b>Explosive Atmosphere</b>	<b>DO-160F</b>	<b>9</b>	<b>H</b>
<b>Waterproofness</b>	<b>DO-160F</b>	<b>10</b>	<b>S</b>
<b>Fluid Susceptibility</b>	<b>DO-160F</b>	<b>11</b>	<b>F</b>
<b>Sand and dust</b>	<b>DO-160F</b>	<b>12</b>	<b>S</b>
<b>Fungus</b>	<b>DO-160F</b>	<b>13</b>	<b>F</b>
<b>Salt Spray</b>	<b>DO-160F</b>	<b>14</b>	<b>T</b>
<b>Magnetic Effects</b>	<b>DO-160F</b>	<b>15</b>	<b>Z</b>
<b>Power Input</b>	<b>DO-160F</b>	<b>16</b>	<b>B</b>
<b>Voltage Spike</b>	<b>DO-160F</b>	<b>17</b>	<b>B</b>
<b>Audio Freq. Conducted Susceptibility</b>	<b>DO-160F</b>	<b>18</b>	<b>B</b>
<b>Induced Signal Susceptibility</b>	<b>DO-160F</b>	<b>19</b>	<b>AC</b>
<b>Radiated and conducted Susceptibility</b>	<b>DO-160F</b>	<b>20</b>	<b>T</b>
<b>Radiated and conducted Emissions</b>	<b>DO-160F</b>	<b>21</b>	<b>H</b>
<b>Lightening Induced Transient Susceptibility</b>	<b>DO-160F</b>	<b>22</b>	<b>A2E2X</b>
<b>Lightening direct effects</b>	<b>DO-160F</b>	<b>23</b>	<b>2A2A</b>
<b>Icing</b>	<b>DO-160F</b>	<b>24</b>	<b>A</b>
<b>Electrostatic Discharge</b>	<b>DO-160F</b>	<b>25</b>	<b>A</b>

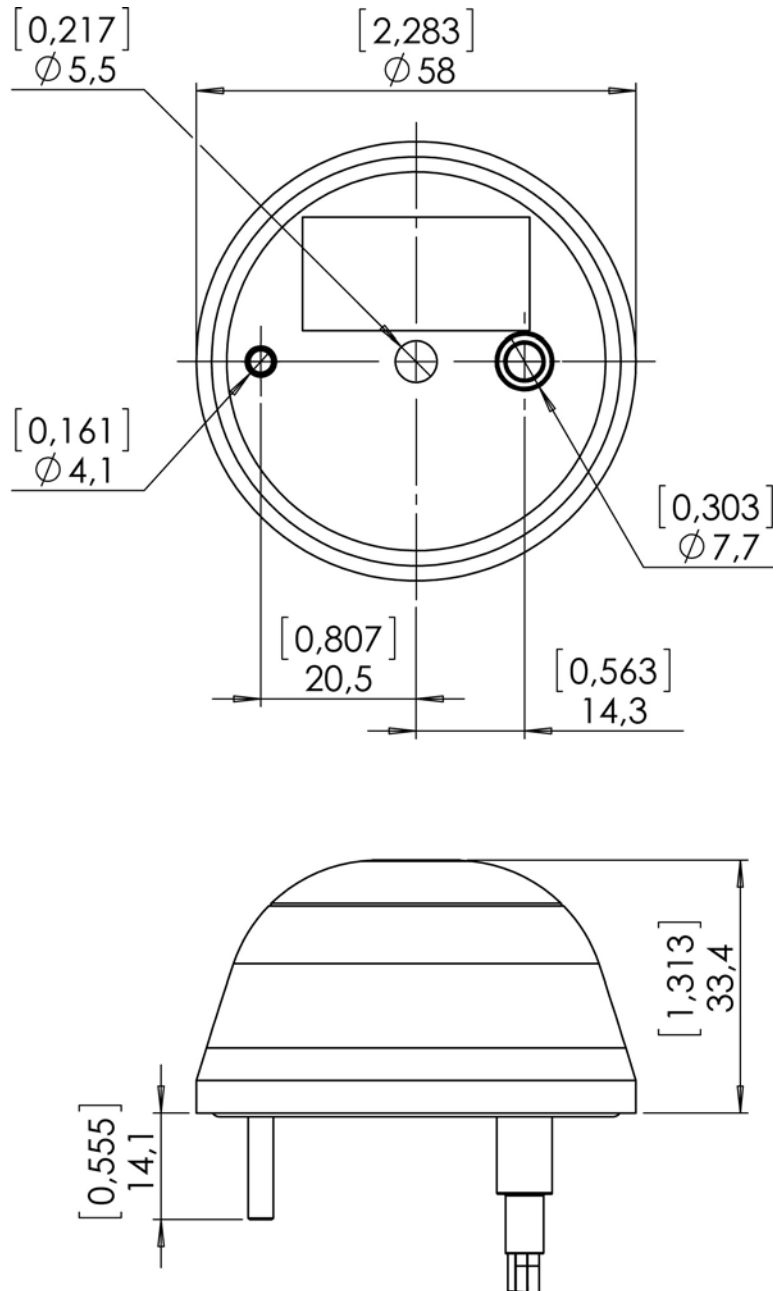
### 3.4 TECHNICAL DRAWING

#### 3.4.1 RedBaron XP Galactica



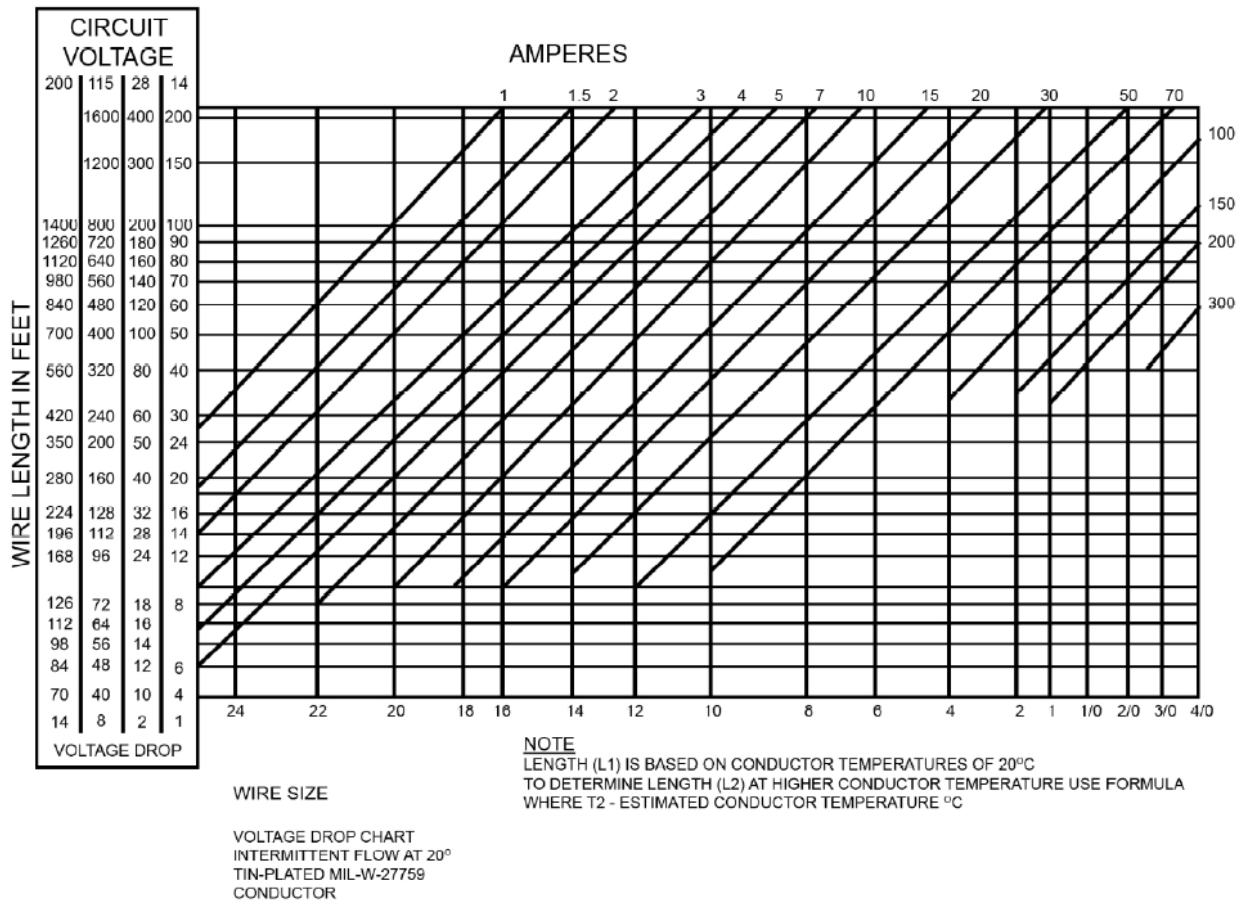
*Dimensions in [inches] mm*

### 3.4.2 RedBaron Mini Galactica



Dimensions in [inches] mm

### 3.5 WIRING CHART



### 3.6 EQUIPMENT LIMITATION

RedBaron XP Galactica™ and RedBaron Mini Galactica™ should only be powered by 9-36 Vdc, typically a 12 or 24 volt aircraft battery.

This article meets the minimum performance and quality control standards required by the technical standard order ETSO C96a. Installation of this article requires separate approval.

#### Deviations

This article deviates from the ETSO C96a by the usage of newer revisions of the following standards:

SAE AS 8017 rev. B used instead SAE AS 8017 rev. A

### 3.7 TESTING OF THE LIGHT 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 Aveo Galactica RedBaron light, and wish to test the function of the light prior to installation on your aircraft, please note the following:

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.

1. Remove the light from the package. Note that there are three (3) wires coming from each light. These wires are:
  - a. Black wire – Ground wire (negative lead)
  - b. Yellow wire – Anti-collision light function wire (positive lead)
  - c. Blue wire – used if the synchronization of the Aveo lights is selected
2. Testing of the function of the light can be done with a regular 12V/5A dc power supply (not a battery charger). Connect the black wire to the ground (negative) leads of a power supply, then connect the yellow wire to the positive (+) leads on the power supply. The anti-collision light should start flashing. Connecting the blue wires from each AveoFlash light together (and not to the ground or positive terminals on the battery) should show that the lights are flashing together and indicates the synchronization feature is working properly. When installed on the aircraft, using the aircraft's power (14 or 28 volts), the light will be at its maximum intensity.

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

#### IMPORTANT NOTES:

1. Under no circumstances should any power supply other than a 9-36 Vdc, or a 12/24 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 and 36 volts. Use of a battery charger or other power unit to test the light will void the warranty and may damage the light.
2. All power supplies for existing strobe lights, flasher beacons, etc. are required to be removed from the aircraft prior to the installation of the Aveo light.

If you have any questions about the installation of the lights, please refer to our web site: <http://www.aveoengineering.com>, and check FAQ and other links on our aviation lights web page.

### 3.8 CARE AND CLEANING OF YOUR AVEO ENGINEERING AVIATION LIGHTS

When you receive your Aveo Engineering Group Aviation Lights, they will have been factory polished and ready to install on the aircraft. Upon installation, just give the lights a good coat or two of a quality automotive polish. This should protect the lights from dirt and other environmental factors. Once or twice a month, just refresh the polish and hand buff to bring back the lights to factory like new condition.

If the lights need a deeper cleaning, they can be polished with a good automotive cleaner wax and/or a liquid polishing compound. The liquid polishing compounds can normally be found at automotive parts stores or an automotive paint store. After using a polishing compound, just give the lights another coat of an automotive polish and you will again protect the lights against dirt, etc. An electric buffing machine, with a lamb's wool cover, can also be used for deeper cleaning and polishing. Under no circumstances should any petroleum based product be used to clean the lights.

### 3.9 NOTES ON INSTALLATION

Please use M5x45mm (DIN912) or equivalent mounting screw for the installation. Spread the tightening forces evenly around the mounting hole. Stainless steel screw is recommended. Length depends upon placement location on aircraft.

### 3.10 ETSO REQUIREMENT DEVIATION

Paragraph a. (1) through a. (3) of **ETSO-C96a** requires the minimum performance standards (MPS) listed in SAE8017A and RTCA DO-160B. AVEO aviation light Part Number **AVE-RBXPW-001/AVE-RBXPR-001** and **AVE-RBXPW-002/AVE-RBXPR-002** meets the Minimum Performance Standard (MPS) listed in SAE AS8017B and RTCA DO-160E/F and was authorized with deviation by EASA. Detailed information relating to this approved deviation can be found at <http://www.aveoengineering.com>.

### 3.11 CONTINUED AIRWORTHINESS INFORMATION

This product is delivered with form F-AVE-001A which is for the operator to report any occurrences to Aveo Engineering as the ETSO holder. The form contains the Aveo Engineering telephone number and the occurrence e-mail address ([occurrence@aveoengineering.com](mailto:occurrence@aveoengineering.com)). **The operator must report immediately** as the ETSO holder must report occurrences having a potential for an unsafe condition within 72 hours.

**a. Circuit/Wiring Protection**

Each Galactica 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. It's recommended that the operation of strobes without airflow be limited to avoid heat build up and this NTC circuitry feature is designed to more than triple the life of the LEDs and electronic components thereby providing an even great margin of safety for continued airworthiness due to the dramatic enhancement of electronics reliability.

**b. Periodic Inspection Procedure for Galactica Series**

The Aveo RedBaron Galactica lights should always be checked for proper operation during pre-flight. This procedural information is already provided in all general aviation aircraft flight manuals.

The lights should be visually inspected for general condition, proper operation, and correct installation at each annual and/or 100 hour inspection. Any debris or atmospheric deposits accumulated on the surface of the lights should be removed using a UV Wax such as Farecia Profile UV Wax to ensure ongoing optical clarity. In addition refer to section 10 of installation manual for detailed cleaning instructions.

Turn the lights on and do the following:

1. Put on polarized sunglasses or welder goggles to prevent eye damage when looking into the lights.
2. Examine the individual LEDs as per the diagram below. If any of the conditions as indicated on the diagram are exceeded, the light shall be removed and sent to Aveo Engineering for replacement under the Aveo **Lifetime** Warranty Program.

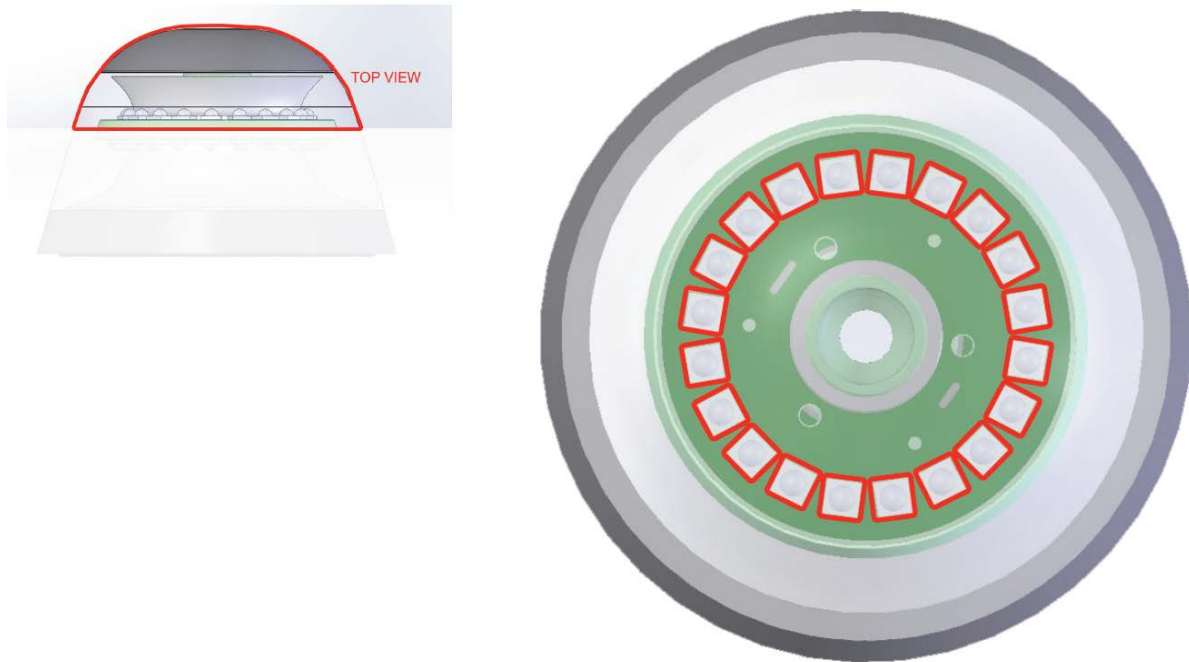


Figure 1: Top LEDs (RedBaron XP Galactica and RedBaron Mini Galactica)

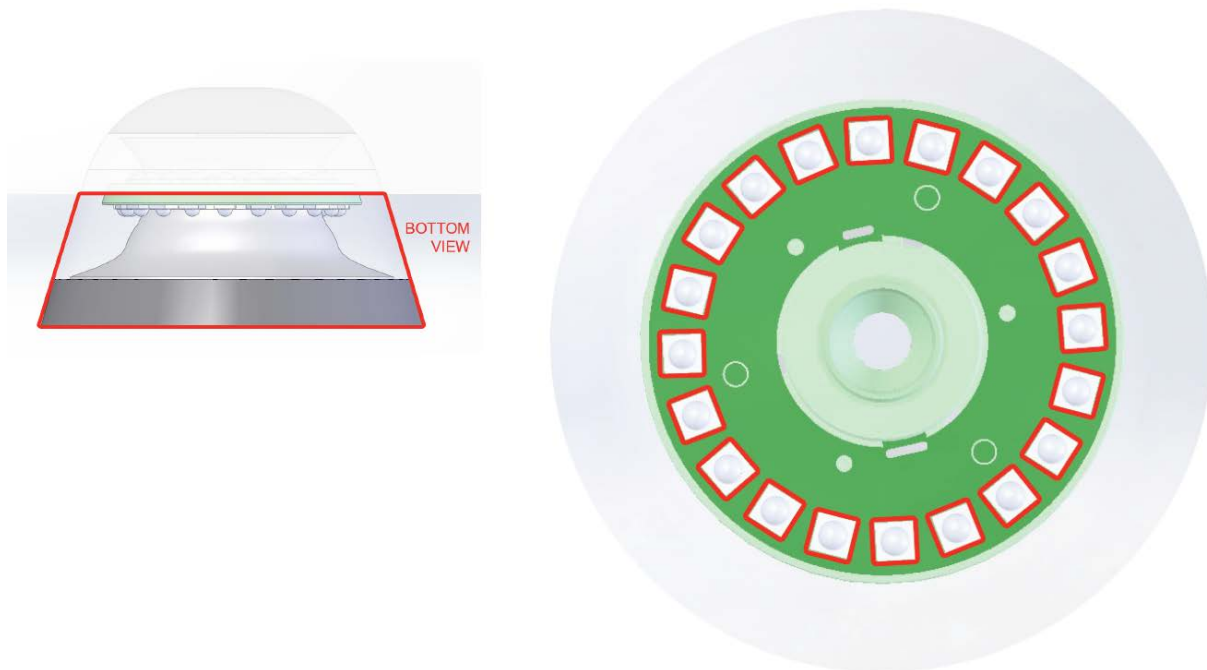


Figure 2: Bottom LEDs (RedBaron XP Galactica only)