



INSTALLATION MANUAL

Titan 46 DoubleDual

AVE-TI46DD-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:

- **Titan 46 DoubleDual** - AVE-TID46TLIW-TD1

Compiled by:  25 May 2021
Petr Jaroš
Engineer, Aveo Engineering Group, s.r.o.

Approved by: _____ 25 May 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	Affected Pages
01	Initial Issue	25 May 2021	ALL

Table 01: Record of Document Amendments

0.3 Affected Pages Procedure

ALL pages affected by ANY raise of issue of this document will be listed in Table 01 - **Affected 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 *Titan™ 46 DoubleDual*

Titan™ 46 DoubleDual is a high powered PAR46 LED light use in GA and transport category aircraft. It has been designed to be lightweight and with a low power draw to meet the highest requirements of all certified aircraft.

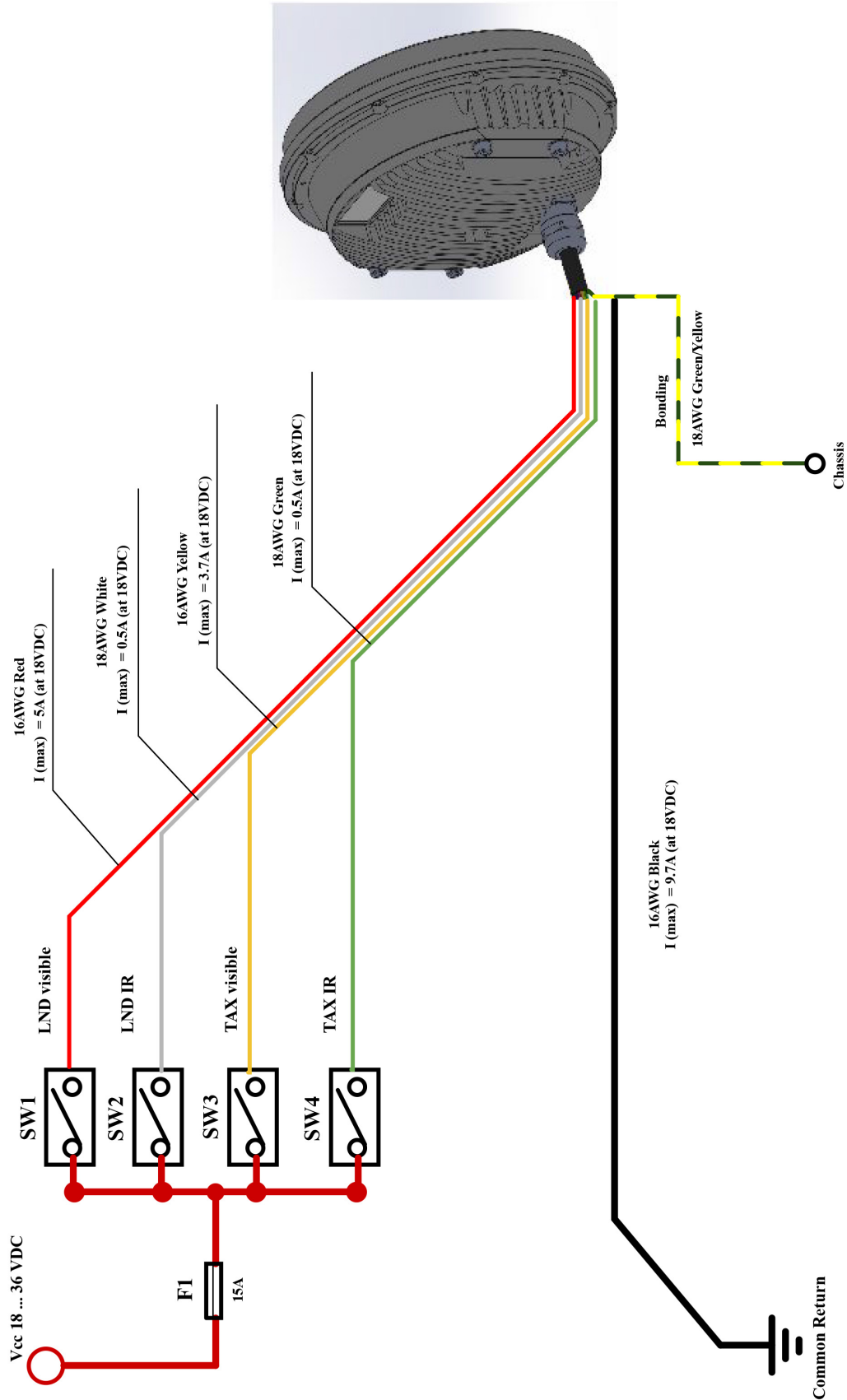
- **Titan 46 DoubleDual** - AVE-TID46TLIW-TD1

1.2 *Operating Instructions*

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

Operating Voltage range is +18...+36VDC.

1.3 Installation Schematic / Wiring Diagram



1.4 Control & Power Inputs

BLACK	Ground – GND (AWG16)
RED	Landing Visible LEDs power (AWG16)
YELLOW	Taxi Visible LEDs power (AWG16)
WHITE	Landing IR LEDs Power (AWG18)
GREEN	Taxi IR LEDs Power (AWG18)
GREEN/YELLOW	Bonding (AWG18)

Length: 300 mm

1.5 Technical Specification

Light characteristics:	PAR46 replacement, Multimode (Landing Visible, Landing IR, Taxi Visible, Taxi IR)
Voltage range:	18-36VDC
Voltage protection:	a. Transient voltage: 2 second +80VDC b. Under-voltage lockout: +17VDC, not more c. Over-voltage lockout: +36.7VDC, not less

Performance:

Landing Visible: Input current: 2.93 A @ 28V DC
Input power: 82.3 W

Taxi Visible: Input current: 2.11 A @ 28V DC
Input power: 61.9 W

Landing IR: Input current: 0.35 A @ 28V DC
Input power: 9.8 W

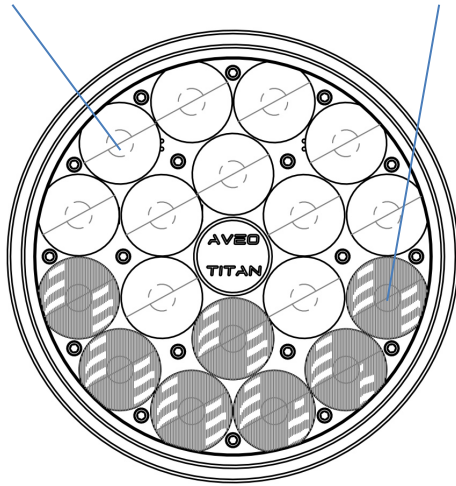
Taxi IR: Input current: 0.35 A @ 28V DC
Input power: 9.8 W

Chromaticity:	Cool White
Low temp. slope start:	-55°C / -67°F
Ambient temperature:	-55°C...+85°C / -67°F...+185°F
Overheat protection:	Yes
Wiring:	See section 1.4
Weight:	1110 g / 2.447 lb
Useful life:	not less than 15.000 aircraft flight hours

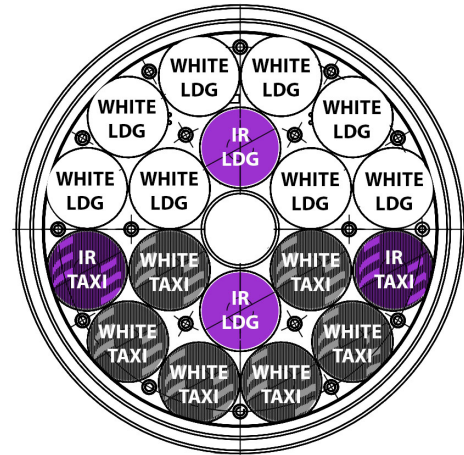
Viewing Angle:

Landing Lens: 5°

Taxi Lens: 45° x 10°



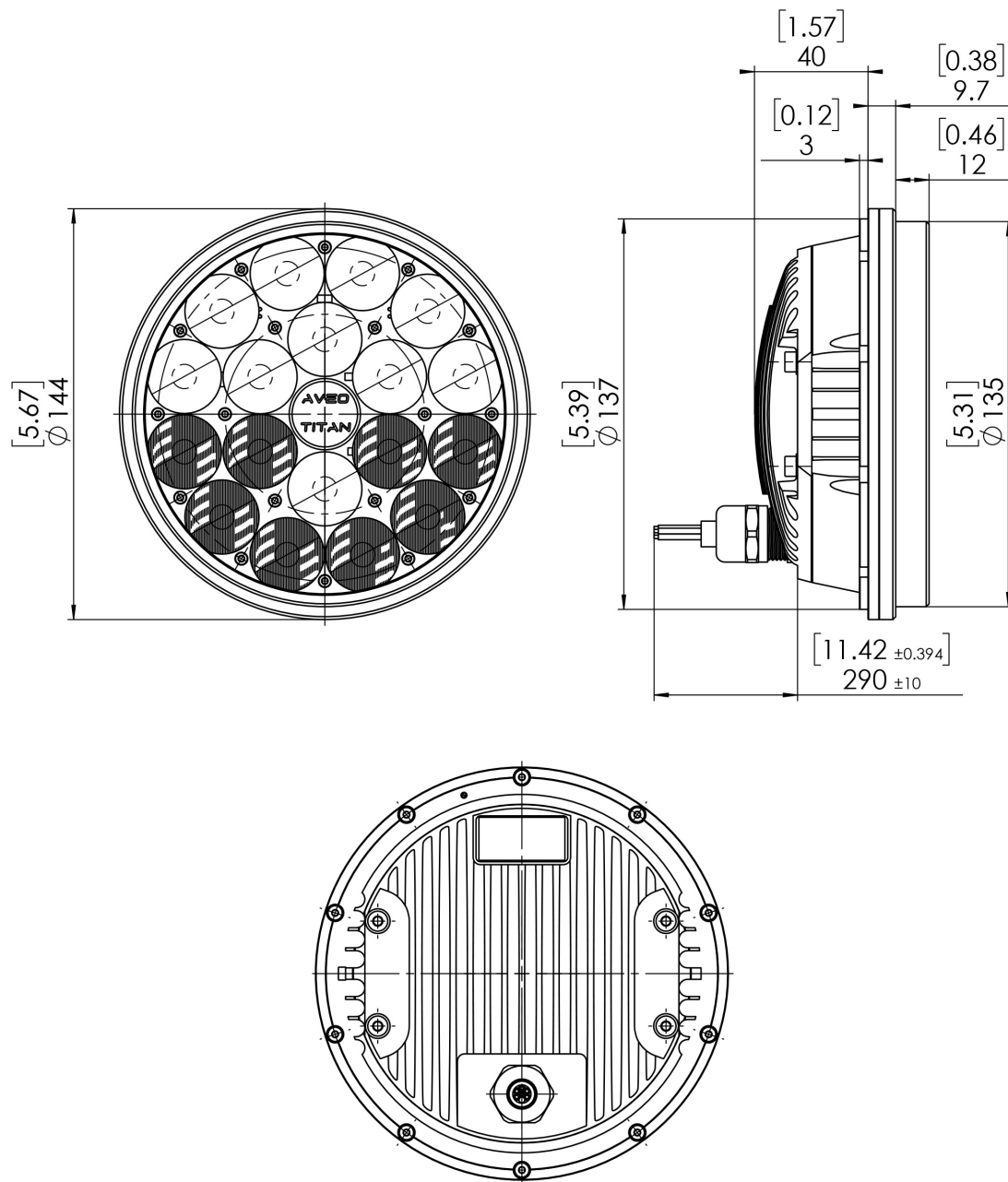
LED Functions:



Device RTCA/DO160 qualified:

- chapter 4, Temperature - Altitude, Category F2
- chapter 5, Temperature Variation, Category A
- chapter 6, Humidity, Category B
- chapter 7, Operational Shocks and Crash Safety, Category A
- chapter 8, Vibration, Category U, curves G
- chapter 9, Explosion proofness, Category H
- chapter 10, Waterproofness, Category S
- chapter 11, Fluids Susceptibility, Category F
- chapter 12, Sand and Dust, Category S
- chapter 13, Fungus resistance, Category F
- chapter 14, Salt spray, Category T
- chapter 15, Magnetic effects, Category Z
- chapter 16, Power Input, Category BX
- chapter 17, Voltage Spike, Category B
- chapter 18, Audio Frequency Conducted Susceptibility, Category B
- chapter 19, Induced Signal Susceptibility, Category AC
- chapter 20, Radio Frequency Susceptibility, Category TT
- chapter 21, Emission of Radio Frequency Energy, Category H
- chapter 22, Lightning induced transient susceptibility test, Category A2E2X
- chapter 23, Lightning Direct Effects, Category 2A2A
- chapter 24, Icing, Category A
- chapter 25, Electrostatic Discharge (ESD), Category A
- chapter 26, Fire, Flammability, Category C

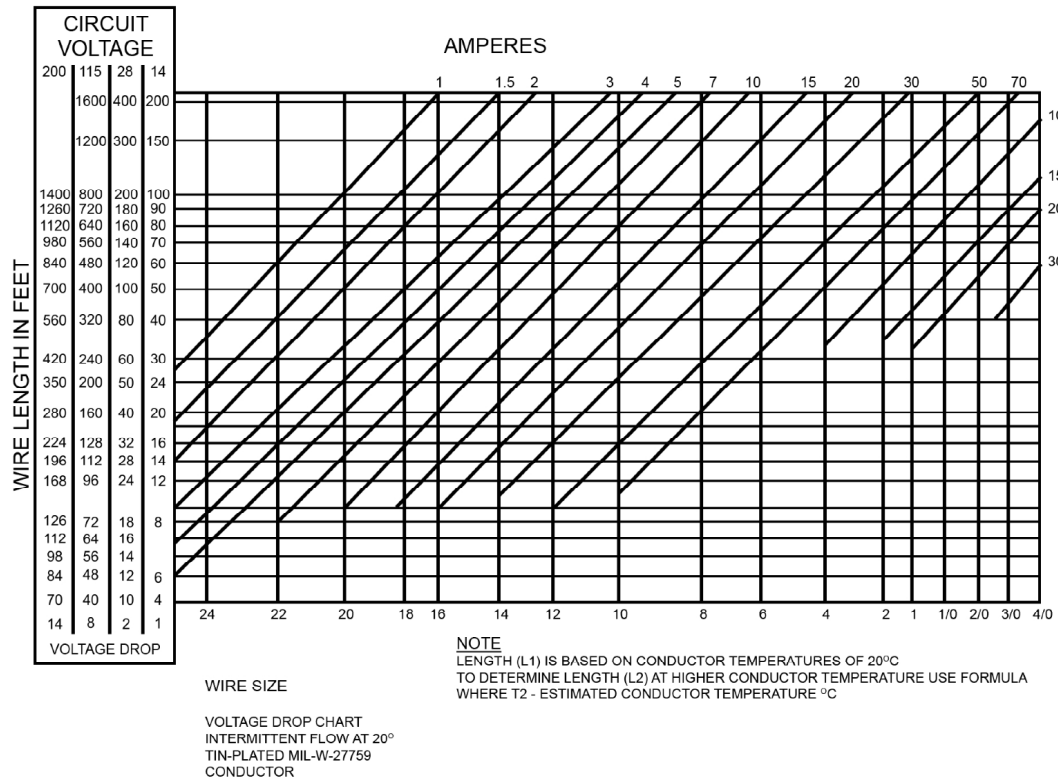
1.6 Technical Drawing



*dimensions in [inches] / mm

1.7 Wiring Chart

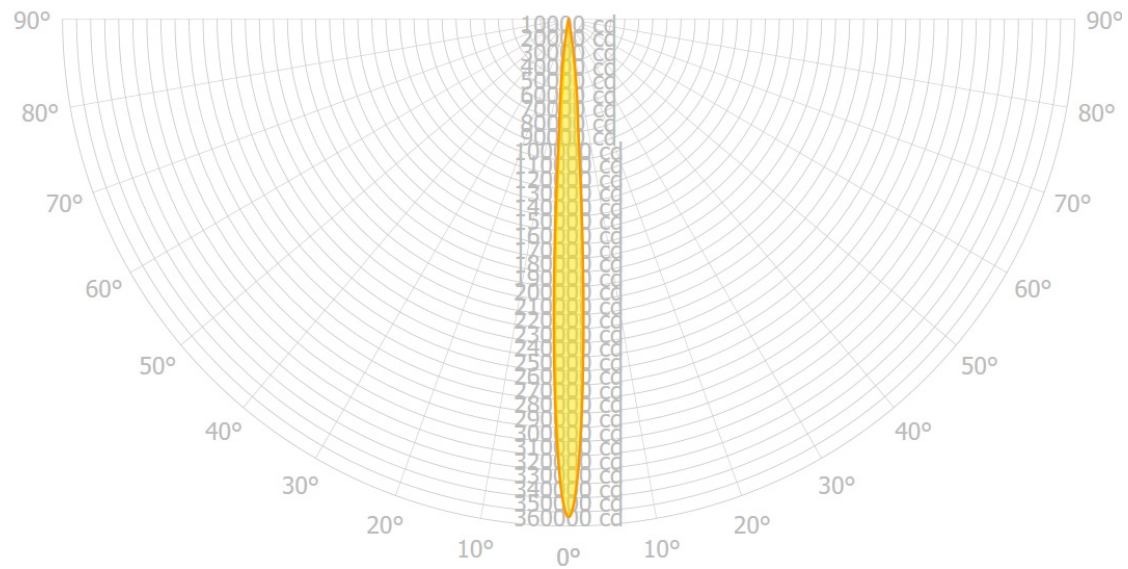
Use diagram below defining the wiring size depending on the current and the wire length. Make sure you add up the current for all connected lights. If current is not given, then divide the power by the voltage.



1.8 Optic Simulation

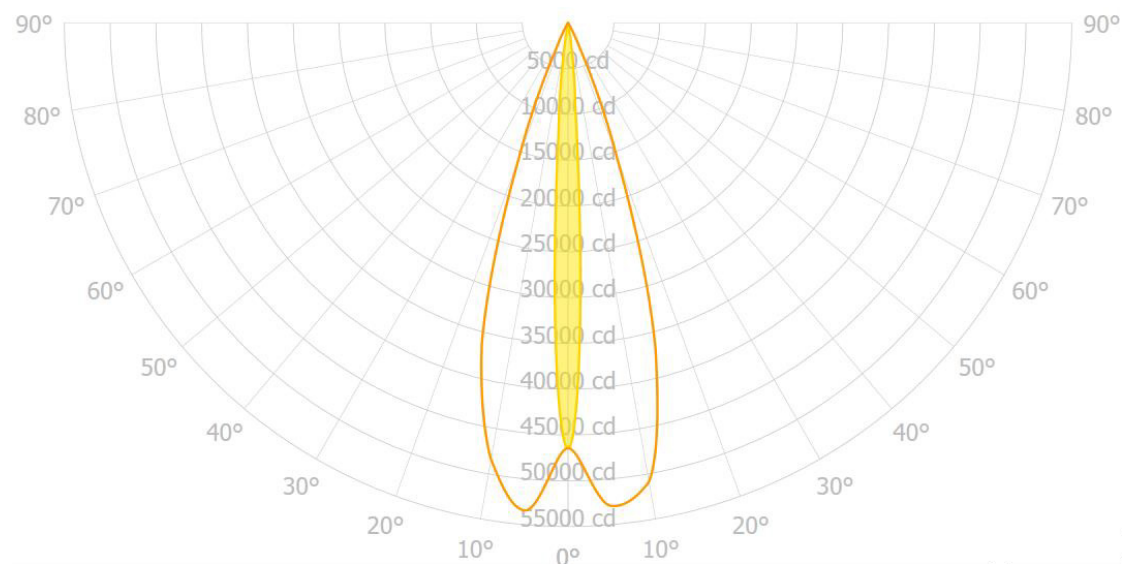
Landing Visible Version

353 000 cd



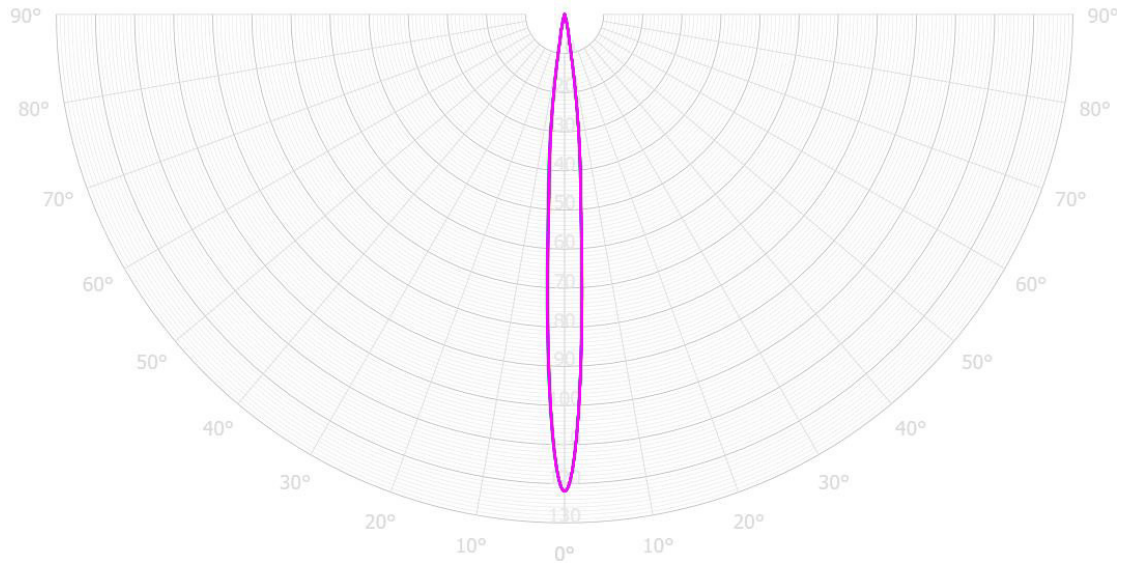
Taxi Visible Version

53 000 cd



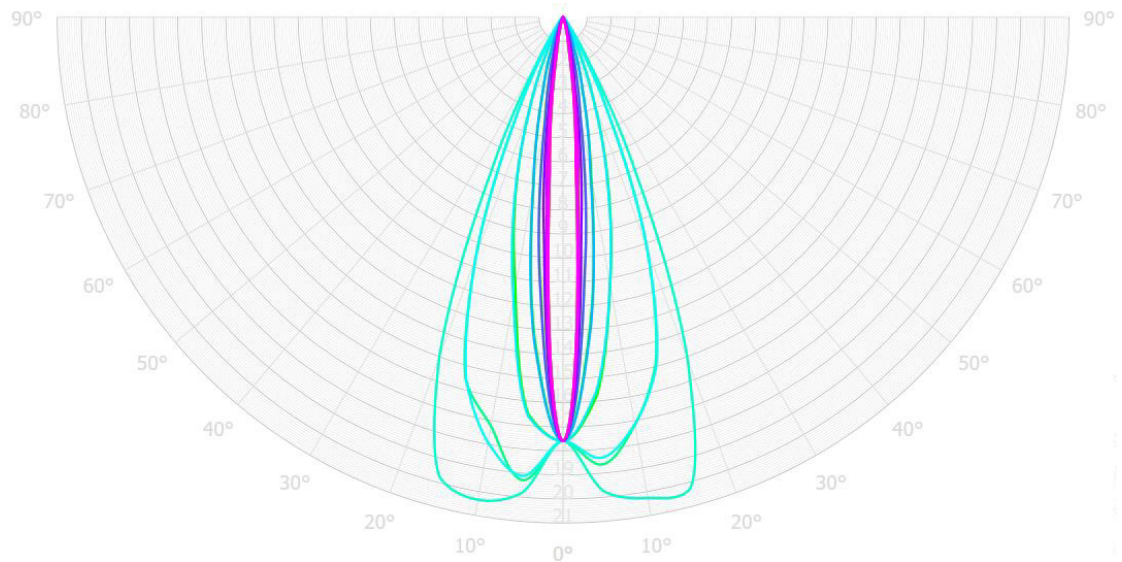
IR Landing

W/sr: 122



IR Taxi

W/sr: 20



1.9 Equipment Limitation

Titan 46 DoubleDual should only be powered by 18-36VDC

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 **Titan 46 DoubleDual** 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 6 wires:

BLACK	Ground – GND (AWG16)
RED	Landing Visible LEDs power (AWG16)
YELLOW	Taxi Visible LEDs power (AWG16)
WHITE	Landing IR LEDs Power (AWG18)
GREEN	Taxi IR LEDs Power (AWG18)
GREEN/YELLOW	Bonding (AWG18)
3. Testing of the function of the light can be done with a regular 28VDC power supply (not a battery charger). Connect the ground wire to black wire and then connect the power wire to the red wire. The landing light section should start lighting. Disconnect the power wire. Connect the power wire to the yellow wire. The taxi light section should start lighting. When installed on the aircraft, using the aircraft's power (28VDC), 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 18-36VDC, or a 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 18-36 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

1.12 Continued Airworthiness Information

Circuit/Wiring Protection

Each Titan 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.

Periodic Inspection Procedure for Titan 46 DoubleDual

The **Titan 46 DoubleDual** light should always be checked for proper operation during preflight. 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 hours inspection. In addition refer to section 1.10 of installation manual for detailed cleaning instructions.

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.