INSTALLATION MANUAL

Avior Dual

AVE-WPXI-IM

TABLE OF CONTENTS

PART 0 DOCUMENT ADMINISTRATION 3

0.1 Document Approval 3
0.2 Amendment Record Procedure 4
0.3 Affected Pages Procedure 4

PART 1 INSTALLATION DATA 5

1.1 Avior™ 5
1.2 Operating Instructions 5
1.3 Installation Schematic / Wiring Diagram 5
1.4 Control & Power Inputs 9
1.5 Technical Specification 9
1.6 Technical Drawing 10
1.7 Wiring Chart 12
1.8 Optic Simulation 13
1.9 Equipment Limitation 14
1.10 Testing the Lights before Installation 14
1.11 Notes on Installation 15
1.12 Care and Cleaning of Lights 16
1.13 Continued Airworthiness Information 16
1.14 RoHS Compliance Statement 17
1.15 EU REACH Regulation (EC) No. 1907/2006 18

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:

- Avior – with connector (Red/IR) **AVE-WPRI-M01**
- Avior – with connector (Green/IR) **AVE-WPGI-M01**
- Avior – flying leads (Red/IR) **AVE-WPRI-M02**
- Avior – flying leads (Green/IR) **AVE-WPGI-M02**
- Avior DoubleDual – flying leads (Red/IR) **AVE-WPRI-M22**
- Avior DoubleDual – flying leads (Green/IR) **AVE-WPGI-M22**

Compiled by: _____ 21 September 2021
Petr Jaroš
Engineer, Aveo Engineering Group, s.r.o.

Approved by: _____ 21 September 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	08 January 2021	ALL
02	Addition of new part numbers Addition of new wiring diagrams Addition of new data Weight update Addition of new technical drawing Addition of section 1.15 EU Reach Regulation	21 September 2021	3, 5 7, 8 9, 14, 15 9 11 18

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 Avior™

Main features:

- Dual Position Light Green/IR or Red/IR
- Extremely lightweight at 112 grams / 3.95 oz.
- 18-36 V DC input range
- No external power supply
- Light dimming feature for IR
- Light dimming feature for visible section (PN: AVE-WPRI-M22, AVE-WPGI-M22)
- Unmatched circuit technology
- Advanced computer and Gonio photometer engineered optics

Part numbers of major components that make up the equipment complying with the standards specified in ETSO are as follows:

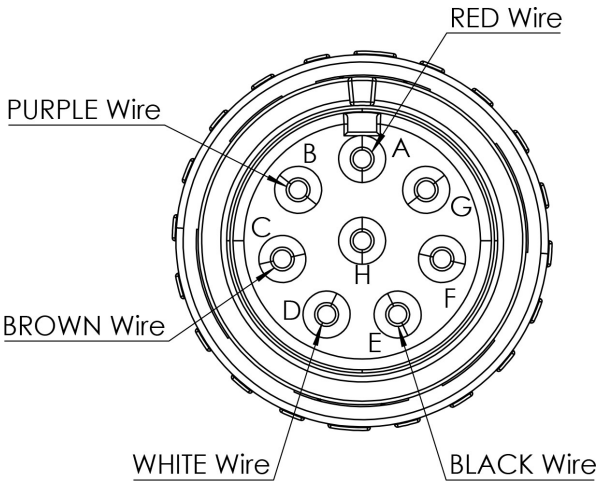
• Avior – with connector (RED/IR)	PN: AVE-WPRI-M01
• Avior – with connector (GREEN/IR)	PN: AVE-WPGI-M01
• Avior – flying leads (RED/IR)	PN: AVE-WPRI-M02
• Avior – flying leads (GREEN/IR)	PN: AVE-WPGI-M02
• Avior Double Dual – flying leads (RED/IR)	PN: AVE-WPRI-M22
• Avior Double Dual – flying leads (GREEN/IR)	PN: AVE-WPGI-M22

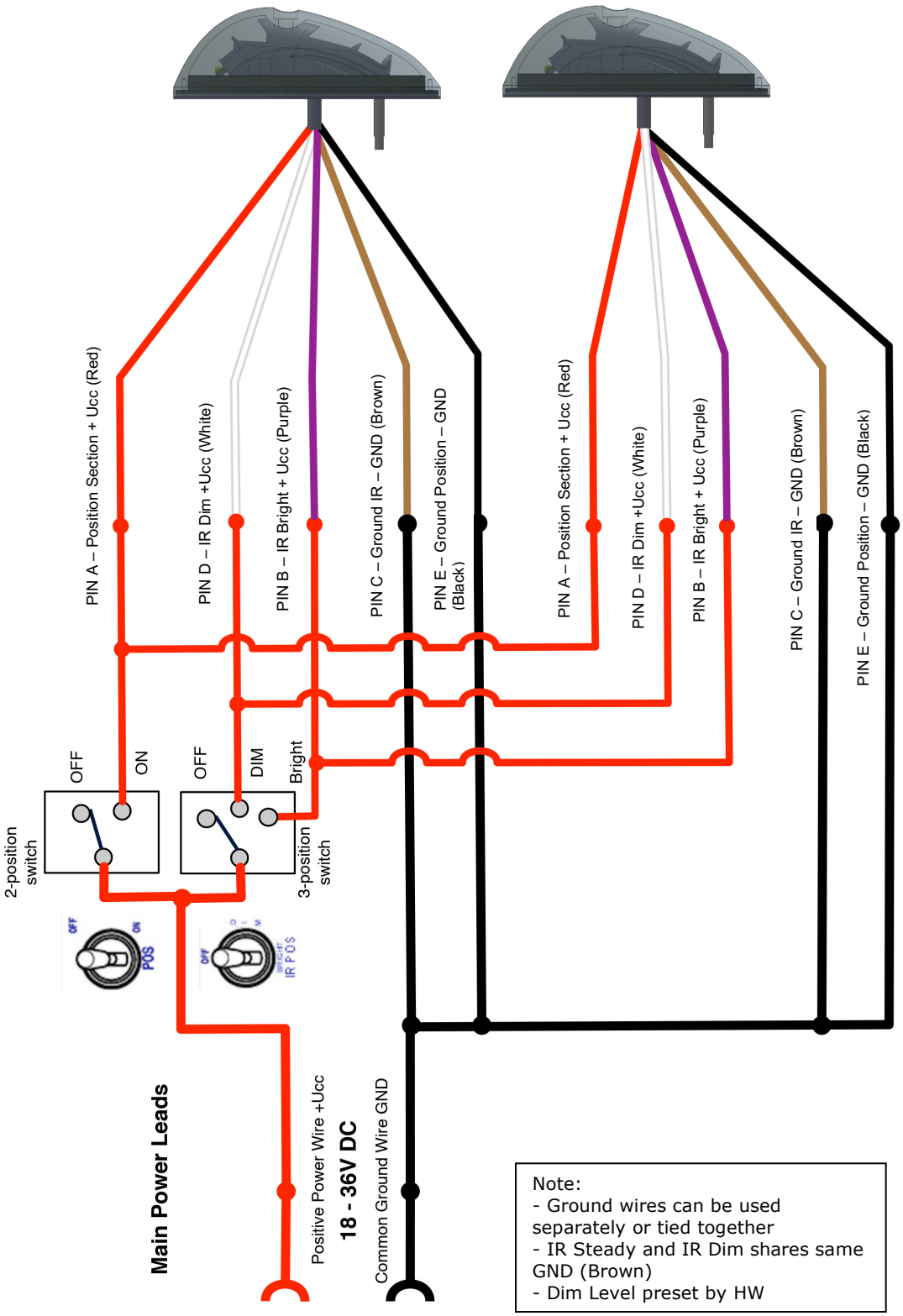
1.2 Operating Instructions

When installed on the aircraft, using the aircraft's power (28 volts), the ***Avior*** light will be at its maximum intensity.
It meets the requirements of **ETSO-C30c** (Aircraft Position Light, **SAE AS8037 rev. A**).
The light operates within the range of voltage from 18 V to 36 V DC.

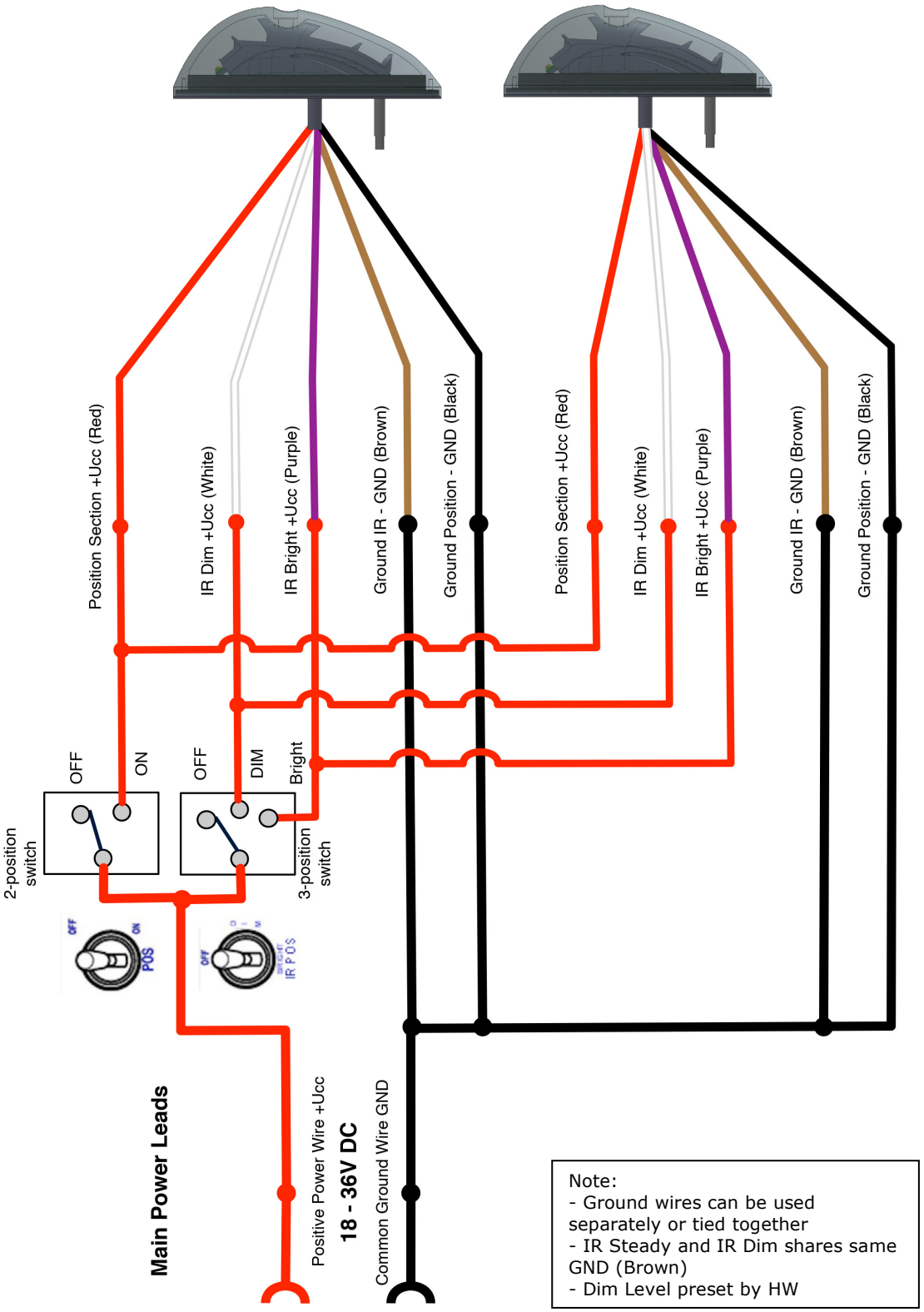
1.3 Installation Schematic / Wiring Diagram

PN: AVE-WPRI-M01, AVE-WPGI-M01
(with connector)

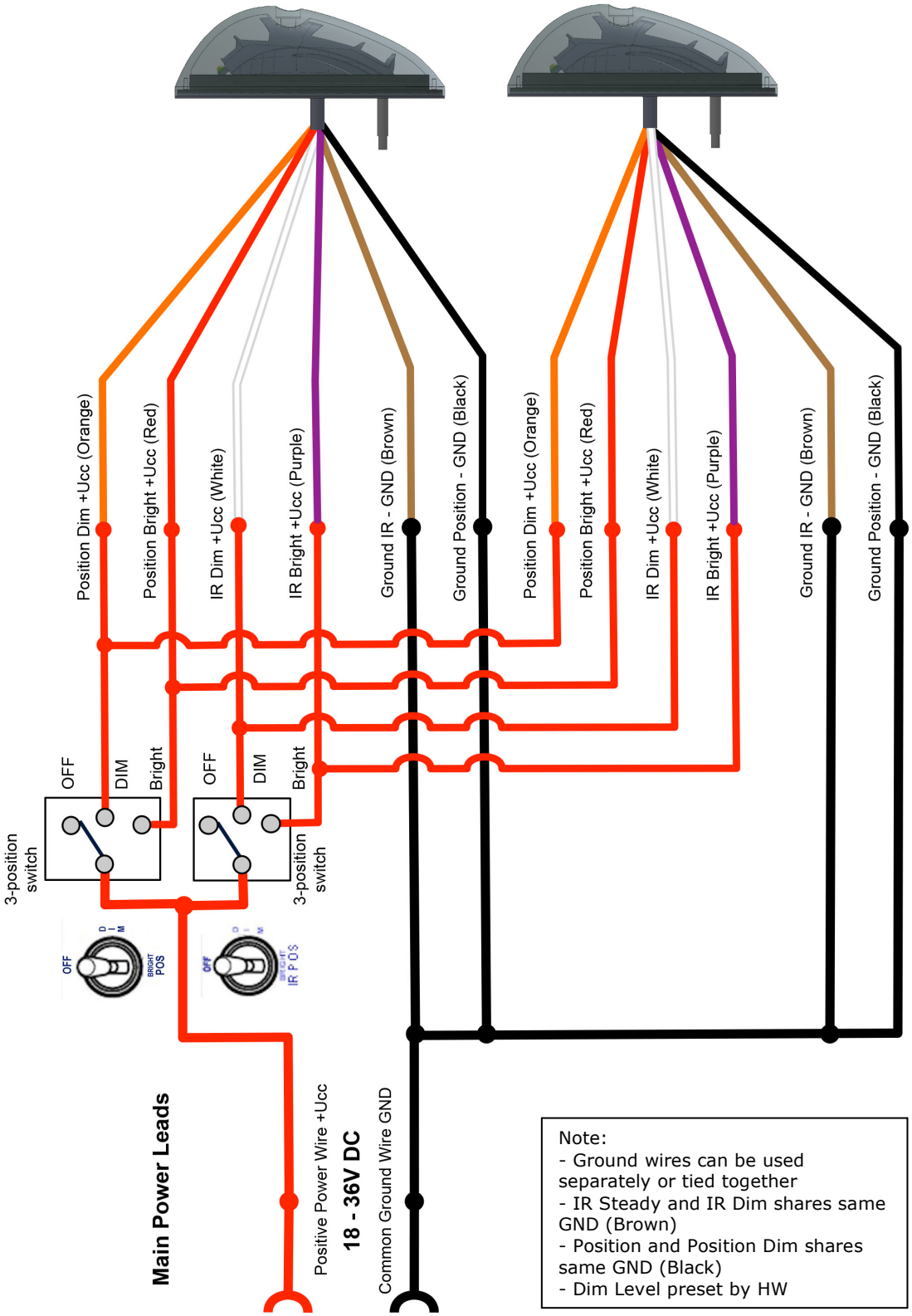



PIN A – Position Section + Ucc (Red)
PIN D – IR Dim +Ucc (White)
PIN B – IR Bright + Ucc (Purple)
PIN C – Ground IR – GND (Brown)
PIN E – Ground Position – GND (Black)
PIN A – Position Section + Ucc (Red)
PIN D – IR Dim +Ucc (White)
PIN B – IR Bright + Ucc (Purple)
PIN C – Ground IR – GND (Brown)
PIN E – Ground Position – GND (Black)
OFF
ON
OFF
DIM
Bright
2-position switch
3-position switch
Main Power Leads
Positive Power Wire +Ucc
18 - 36V DC
Common Ground Wire GND
Note:
- Ground wires can be used separately or tied together
- IR Steady and IR Dim shares same GND (Brown)
- Dim Level preset by HW

PN: AVE-WPRI-M02, AVE-WPGI-M02
(flying leads)



PN: AVE-WPRI-M22, AVE-WPGI-M22
(flying leads)



WIRES:

Teflon insulation, 500V

Wire length from base of unit 153mm min. [6.00 inch]

1.4 Control & Power Inputs

PN: AVE-WPRI-M01, AVE-WPGI-M01 (connector)
PIN A (RED) - Visible branch - AWG 22, Positive power supply line
PIN B (PURPLE) - IR branch - AWG 22, Positive power supply line
PIN C (BROWN) - IR branch - AWG 22, Return
PIN D (WHITE) - IR branch - AWG 22, Dim
PIN E (BLACK) - Visible branch - AWG 22, Return

PN: AVE-WPRI-M02, AVE-WPGI-M02 (flying leads)
RED - Visible branch - AWG 22, Positive power supply line
PURPLE - IR branch - AWG 22, Positive power supply line
BROWN - IR branch - AWG 22, Return
WHITE - IR branch - AWG 22, Dim
BLACK - Visible branch - AWG 22, Return

PN: AVE-WPRI-M22, AVE-WPGI-M22 (flying leads)
RED - Visible branch - AWG 22, Positive power supply line
ORANGE - Visible branch - AWG 22, Dim
PURPLE - IR branch - AWG 22, Positive power supply line
BROWN - IR branch - AWG 22, Return
WHITE - IR branch - AWG 22, Dim
BLACK - Visible branch - AWG 22, Return

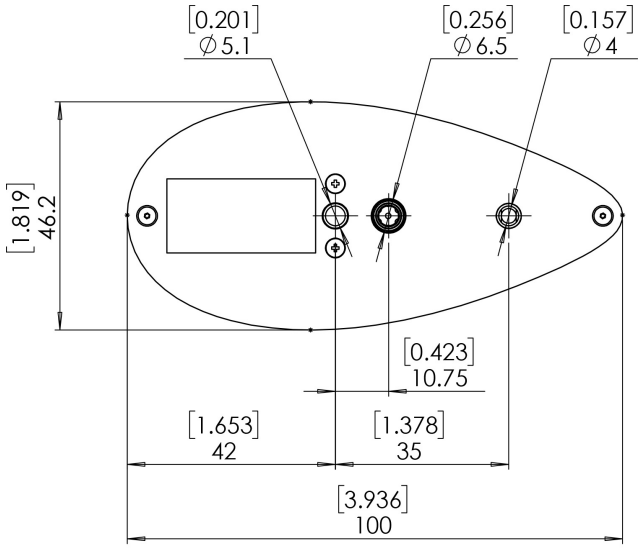
1.5 Technical Specification

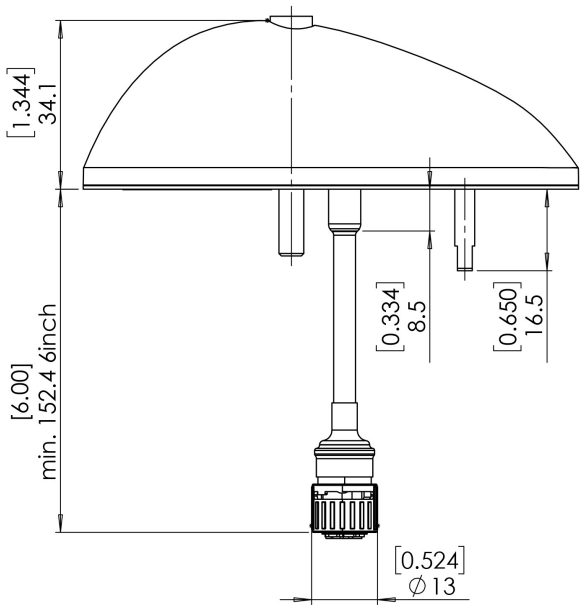
Dimensions:	See section 1.6 Technical Drawing
Operating Voltage Range:	18 – 36 V DC
Ambient Temperature:	from -55°C to +85°C from -67°F to +185°F
Overheat Protection:	Yes (+85°C / +185°F)
Recommended size of mounting screw:	M5 x 40 mm (DIN7984) or equivalent
Reverse Polarity Protection:	Yes
Maximum Transient Voltage:	80 V at 2 sec max, both polarities
Under-Voltage Protection:	Yes
Over-Voltage Protection:	Yes
Waterproof, Dust-proof, Vibration-proof:	Yes
Meets and exceeds requirements of:	• ETSO C30c • SAE AS8037 • DO-160G
Weight: *PN: AVE-WPGI-M01, AVE-WPRI-M01* *PN: AVE-WPGI-M02, AVE-WPRI-M02, AVE-WPGI-M22, AVE-WPRI-M22*	 112 g / 3.95 oz 105 g / 3.7 oz

Input Current Red: Green: Infrared:	 0.18 A @28V 0.28 A @28V 0.25 A @28V
Input Power Red: Green: Infrared:	 5.1 W @28V 7.7 W @28V 6.8 W @28V
Fuse (Circuit Breaker) Recommendation:	1.0A per wire from Red, Orange, Purple, White

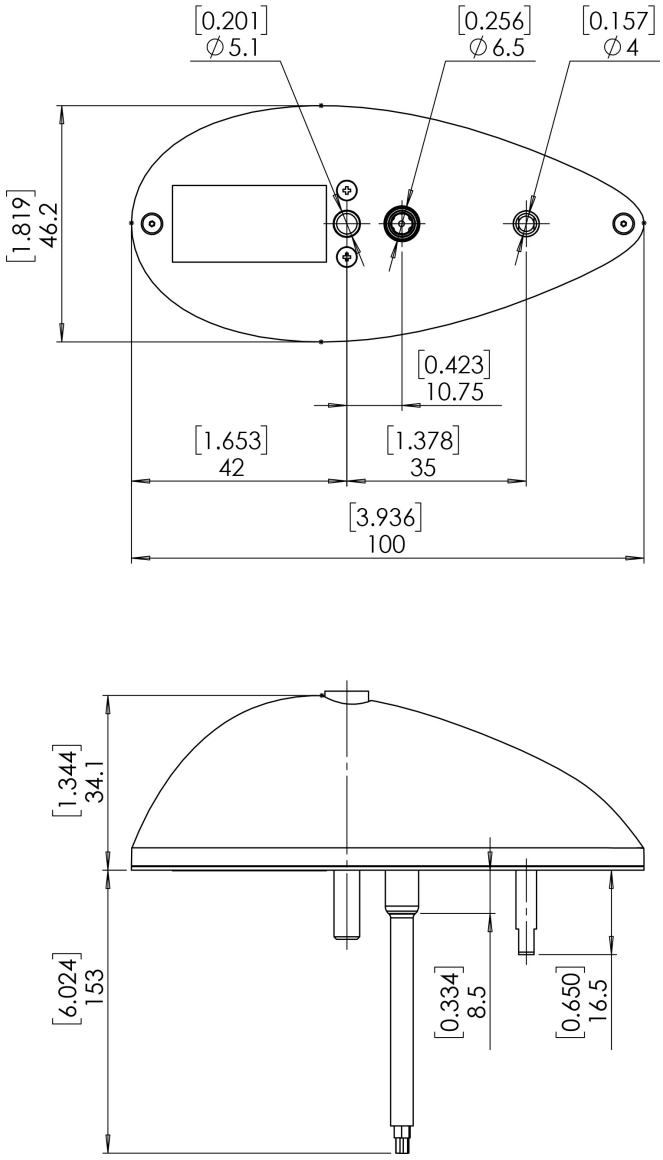
1.6 Technical Drawing

PN: AVE-WPRI-M01, AVE-WPGI-M01





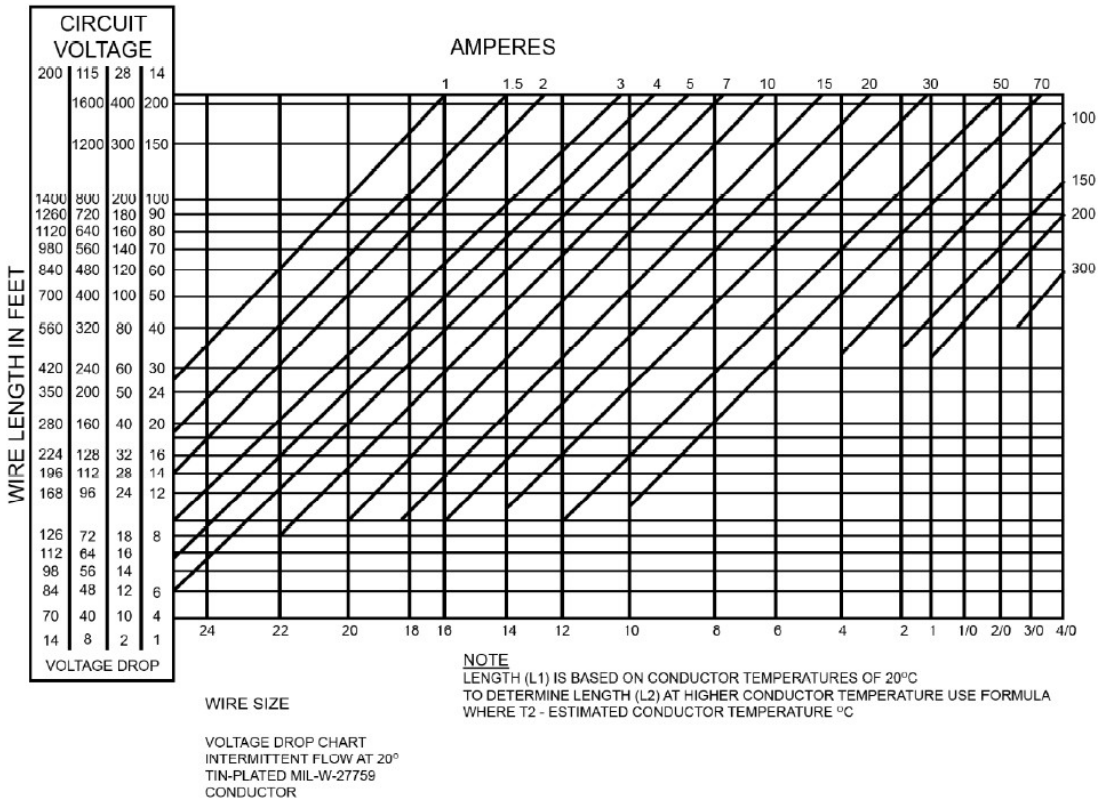
PN: AVE-WPRI-M02, AVE-WPGI-M02, AVE-WPRI-M22, AVE-WPGI-M22



**dimensions in mm / [inches]*

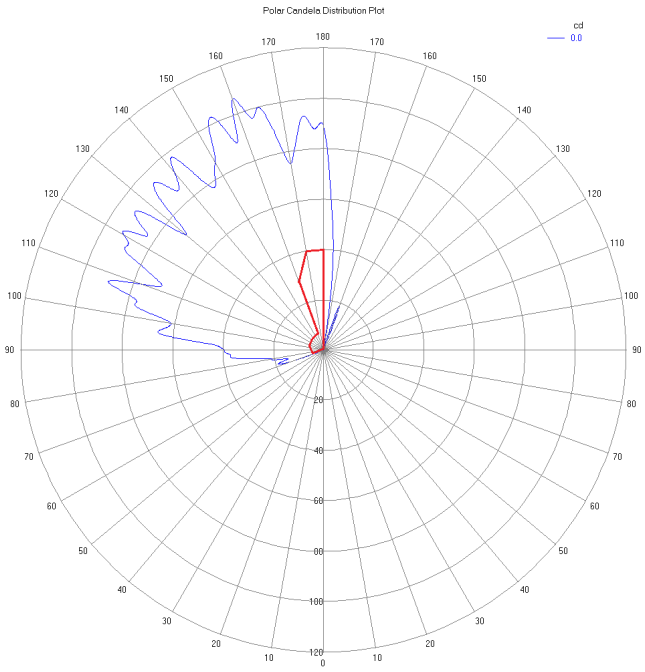
1.7 Wiring Chart

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.

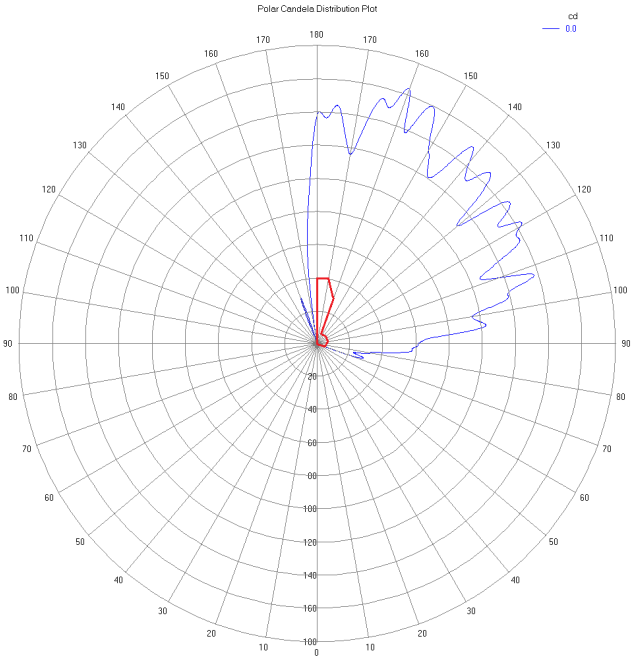


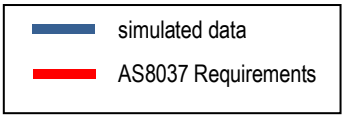
1.8 Optic Simulation

Red

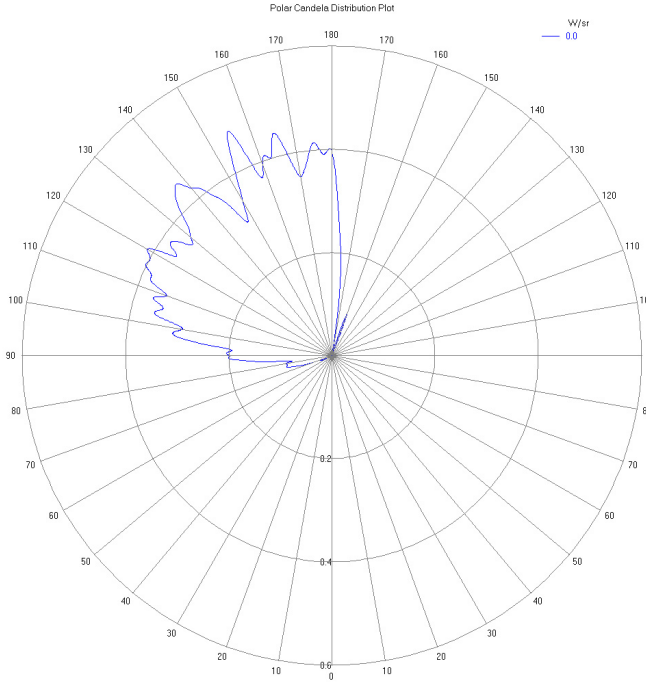


Green

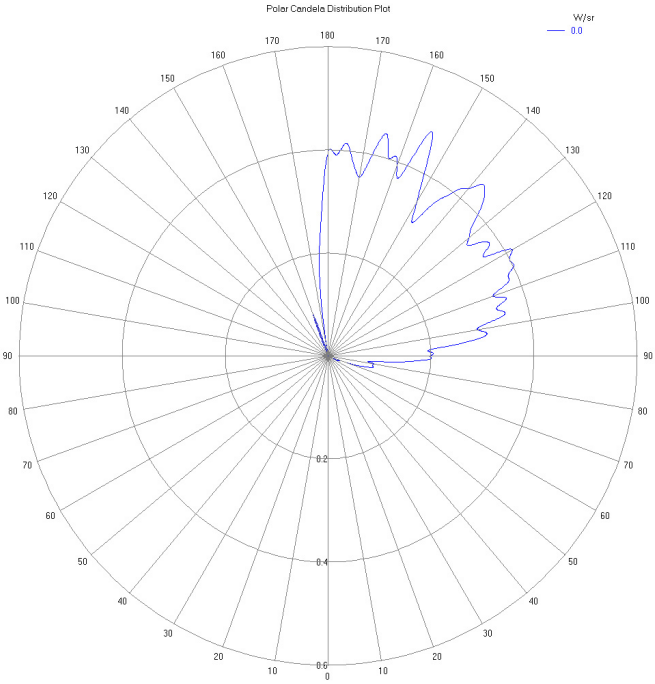




IR left



IR right



1.9 Equipment Limitation

Avior™ should only be powered by 18-36 V DC, typically a 24V aircraft battery.

This article meets the minimum performance and quality control standards required by the technical standard orders ETSO C30c. Installation of this article requires separate approval.

1.10 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 ***Avior*** light, and wish to test the function of the light prior to installation on your aircraft, please observe the following procedure:

1. Review the written information that is enclosed in the packaging. Warranty information as well as a cautionary note about power supply removal is enclosed in each package.

2. Remove the light from the package.

   PN: AVE-WPRI-M01, AVE-WPGI-M01
   Note that there is connector coming from each light. The pins are as follows (see section 1.3):

   PIN A (RED) - Visible branch - AWG 22, Positive power supply line
   PIN B (PURPLE) - IR branch - AWG 22, Positive power supply line
   PIN C (BROWN) - IR branch - AWG 22, Return
   PIN D (WHITE) - IR branch - AWG 22, Dim
   PIN E (BLACK) - Visible branch - AWG 22, Return

   PN: AVE-WPRI-M02, AVE-WPGI-M02
   Note that there are five wires coming from each light. The wires are as follows:

   RED - Visible branch - AWG 22, Positive power supply line
   PURPLE - IR branch - AWG 22, Positive power supply line
   BROWN - IR branch - AWG 22, Return
   WHITE - IR branch - AWG 22, Dim
   BLACK - Visible branch - AWG 22, Return

   PN: AVE-WPRI-M22, AVE-WPGI-M22
   Note that there are six wires coming from each light. The wires are as follows:

   RED - Visible branch - AWG 22, Positive power supply line
   ORANGE - Visible branch - AWG 22, Dim
   PURPLE - IR branch - AWG 22, Positive power supply line
   BROWN - IR branch - AWG 22, Return
   WHITE - IR branch - AWG 22, Dim
   BLACK - Visible branch - AWG 22, Return

3. Testing the function of the light can be accomplished using a regular 24V/5A DC power supply (not a battery charger).

   Visible branch
   Connect the **PIN E (*or BLACK* wire)** to the ground (negative) leads of a power supply, then connect the **PIN A (*or RED* wire)** to the positive (+) leads on the power supply. The light should start lighting.

   (ONLY FOR PN: AVE-WPRI-M22, AVE-WPGI-M22: Disconnect ***RED wire*** and connect ***ORANGE wire***. The light should start lighting in low mode.)

   After testing disconnect all wires.

   Infrared branch
   Connect the **PIN C (*or BROWN wire*)** to the ground (negative) leads of a power supply, then connect the **PIN B (*or PURPLE wire*)** to the positive (+) leads on the power supply. The light should start lighting (use IR camera to check).
   Disconnect **PIN B (*or PURPLE wire*)** and connect **PIN D (*or WHITE wire*)**. The light should start lighting in low mode.

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

   If the tests are successfully completed, the lights can be installed on the aircraft.

IMPORTANT NOTES:

1. Under no circumstances should any power supply other than a 18-36V DC, or a 24V 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 and 36 V. 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 regarding the installation of the lights, please refer to our web site: www.aveoengineering.com

1.11 Notes on Installation

Stainless steel M5 screws are recommended to be used for installation. Screw length depends on placement of screws on wingtips.

1.12 Care and Cleaning of Lights

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

Upon installation, apply one or two coats of quality automotive polish. This should protect the lights from dirt and other environmental factors. Once or twice a month, just refresh the polish and buff the lights by hand.

1.13 Continued Airworthiness Information

From the webpage http://www.aveoengineering.com/ the customer can download the form F-AVE-001A which shall be used by operator for reporting any occurrences to the Aveo Engineering as the ETSO holder. The form contains the Aveo Engineering telephone number and the occurrence e-mail address (occurrence@aveoengineering.com). **The operator shall report immediately** as the ETSO holder is obliged to report occurrences having potential to lead to an unsafe condition within 72 hours.

a. Circuit/Wiring Protection

Each ***Avior*** light features a **Negative Temperature Coefficient** (NTC) circuit that limits internal temperatures by attenuating operating current (with corresponding reduction of brightness) when internal temperatures reach a certain threshold. This proprietary circuitry is intended for protecting the light itself, and associated aircraft wiring, from a thermal runaway condition. The operation of strobes without airflow is recommended to be limited in order to avoid heat buildup. This NTC circuitry feature enables the life of LEDs and electronic components to be tripled and thereby provide an even great margin of safety for continued airworthiness due to the dramatic enhancement of electronics reliability.

b. Periodic Inspection Procedure

The ***Avior*** lights 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 examined for general condition, proper operation, and correct installation at each inspection to be carried out annually and/or after 100 hours of operation. 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 1.11 of installation manual for detailed cleaning instructions.

The following procedure shall be performed:

1. Put on polarized sunglasses or welder goggles to prevent eye damage when looking into the lights.
2. Turn the lights on.

3. Examine the individual LEDs in accordance with the figures 1-2 below. *If any of the LEDs fail, the light shall be removed and sent to Aveo Engineering for replacement under the Warranty Program.*

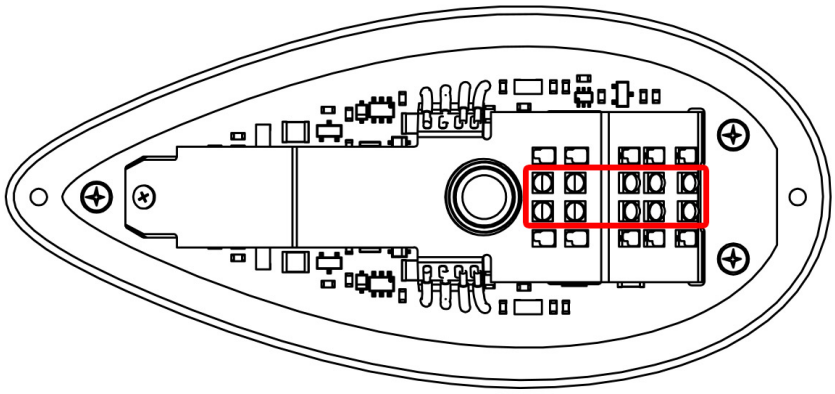


Figure 1: Position Red or Green LEDs

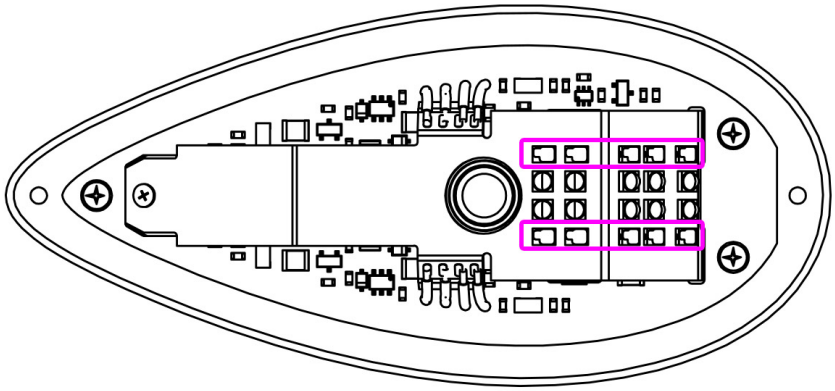


Figure 2: Infrared LEDs

1.14 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.

1.15 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.