# SEALED DETECTORS WITH PRE-AMPLIFIERS

## MODEL **DA211-Cos**

## USER HANDBOOK

DA211A-Cos
DA211B2-Cos
DA211B3-Cos
DA211AB-Cos
DA211L-Cos

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IRRADIAN
Light Measurement Systems & Calibration

# SEALED DETECTORS WITH PRE-AMPLIFIERS

MODEL **DA211-Cos**

**USER HANDBOOK**

CONTENTS:

# 1. INTRODUCTION

SEALED DETECTORS WITH PRE-AMPLIFIERS

Irradian's DA211-Cos range of data logger compatible ultra-violet and visible detectors comprise of a sensitive photodiode detector with filter glasses and a transimpedance amplifier, providing a voltage output. Each detector is sealed in a weatherproof enclosure and operates from a single rail power supply.

Models in the DA211-Cos series include: a UVA detector with peak response at 365nm; a UVB2 and narrower bandwidth UVB3 detector with peak responses at 311nm; a broad band UVAB detector with a peak at 352nm; a visible detector with an accurate photopic response.

Key design features include:

- Self cleaning input diffuser
- Stay dry diffuser with wide water drainage slots
- Good cosine response
- Infinity error correction ring
- All aluminium body with weather resistant anodising
- High stability photodiodes
- Internal calibration resistor, adjustable for annual recalibration

Five models of sealed UV and visible detectors are available:

| | |
|---|---|
| UVA: | Model DA211A-Cos |
| UVB: | Model DA211B2-Cos |
| | Model DA211B3-Cos |
| UVAB: | Model DA211AB-Cos |
| Photopic: | Model DA211L-Cos |

# 2. SPECIFICATION

| Models | Region | Figure | $\lambda_{peak}$ | FWHM |
|---|---|---|---|---|
| A-Cos | UVA | 1 | 365 ± 2nm | 35 ± 2nm |
| B2-Cos | UVB2 | 2 | 311 ± 2nm | 19 ± 2nm |
| B3-Cos | UVB3 | 3 | 311 ± 2nm | 14 ± 2nm |
| AB-Cos | UVAB | 4 | 352 ± 5nm | 84 ± 5nm |
| L-Cos | Photopic | 5 | 555 ± 10 nm | 100 ± 10nm |

| | |
|---|---|
| Cosine Corrected Input: | Within ±5 % up to 70°. Refer to Figure 6. |
| Sensitivity*:<br>** Other ranges available on request.* | 10mV per $W.m^{-2}$<br>10µV per lux |
| Calibration: | ± 7.5% (UV)<br>± 3.0% (lux)<br>Traceable to NPL standards. |
| Diffuser Area: | 176 mm², ∅15 mm. |
| Linearity:<br>Max. Power Density: | <1% Error<br>2 x $10^5$ lux for linear operation. |
| Operating Temperature Range: | -10 to +60 °C |
| Storage Temperature Range: | -20 to +60 °C |
| Temperature Dependence: | Sensitivity <0.1% / °C (typical)<br>Amplifier DC offset Refer to Figure 7. |
| Input Supply: | 7 to 15V DC |
| Current Consumption: | <2mA @12V |
| Warm Up Period: | 10 seconds |
| Cable: | 5 meter screened multicore.<br>(other lengths available) |
| Mounting: | Two M4 tapped holes on a 43mm PCD. |
| Housing: | Black anodised aluminium, also available in stainless steel. |
| Enclosure Rating: | IP65 |
| Weight: | 250g (excluding cable) |

# 3. SPECTRAL RESPONSE

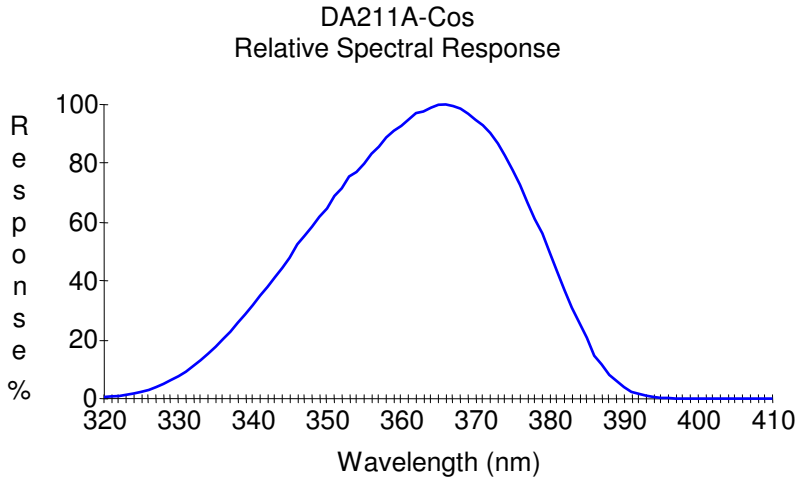



Figure 1

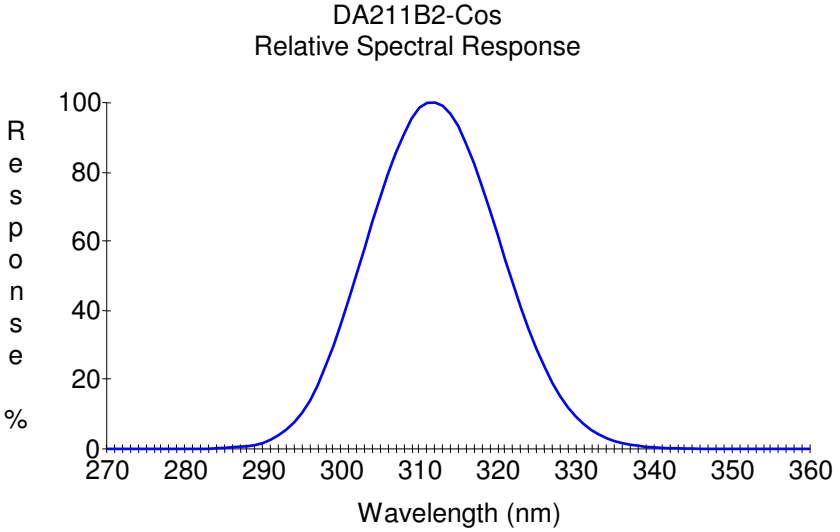



Figure 2

# 3. SPECTRAL RESPONSE (continued):

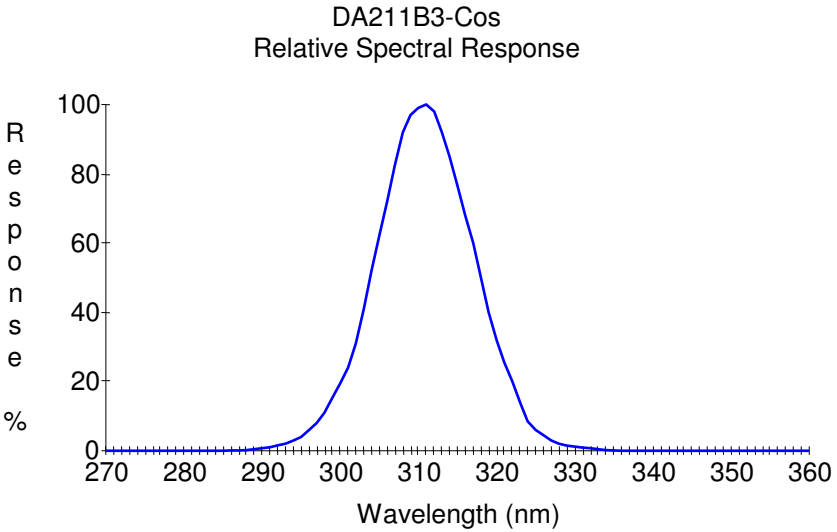



Figure 3

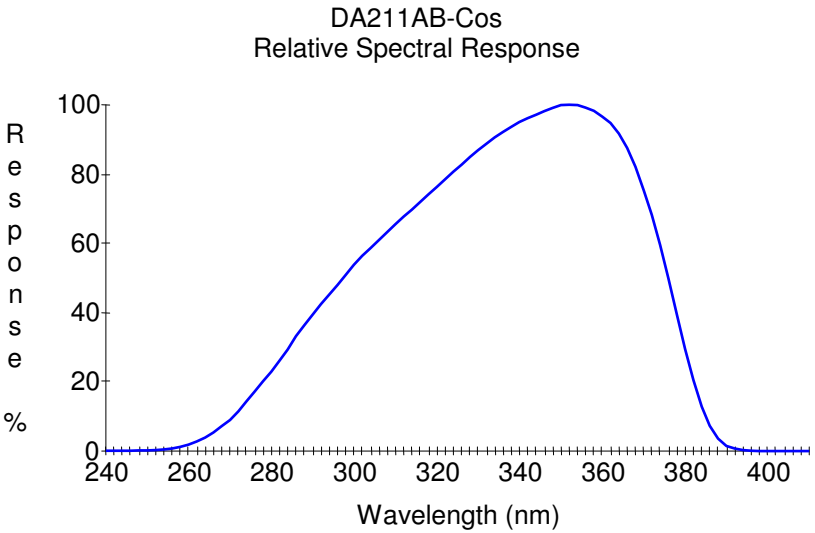



Figure 4

# 3. SPECTRAL RESPONSE (continued):

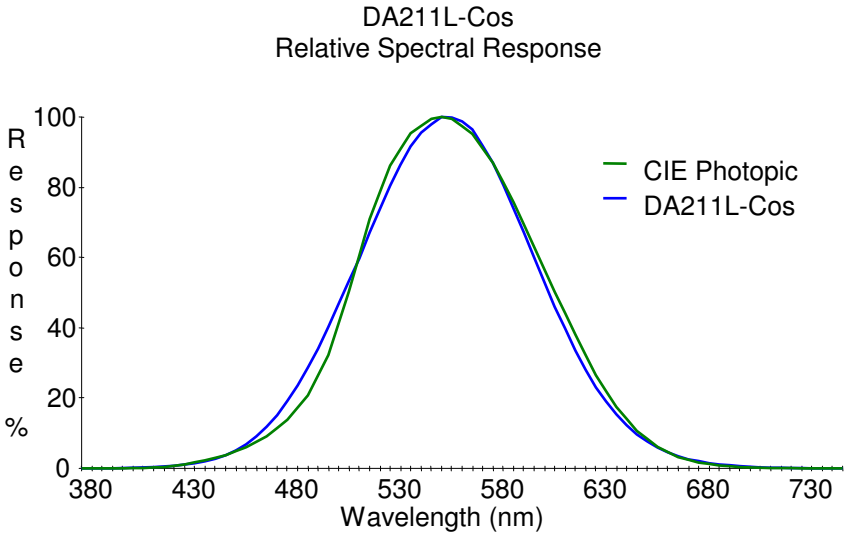



Figure 5

Photometry is the measurement of visible light. Irradian's photopic filter and photodiode (Figure 5) closely matches the response of the standard human eye as published by the CIE (CIE $V_\lambda$). The integrated spectral error is less than ±1% for most types of light source (including mercury line sources and sodium discharges). This means you do not have to apply correction factors to measurements taken under different illumination conditions. It also means that the diode/filter will accurately measure mixtures of different sources such as daylight and artificial light.

# 4. COSINE ANGULAR RESPONSE

COSINE CORRECTED INPUT

Angular Response: Accurately cosine corrected to Lambert's Cosine Law.

Maximum error is less than ±5% from true response to 70° from normal incidence.

Typical DA211-Cos
Cosine Angular Response

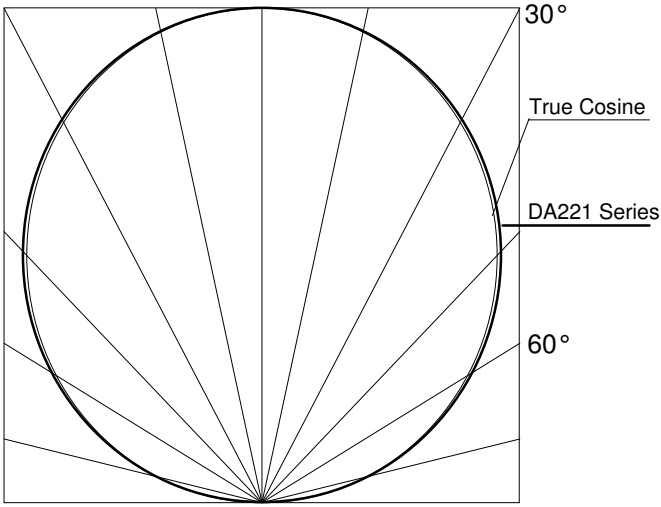



Figure 6

# 5. CIRCUITS & CONNECTIONS

Amplifier DC Offset

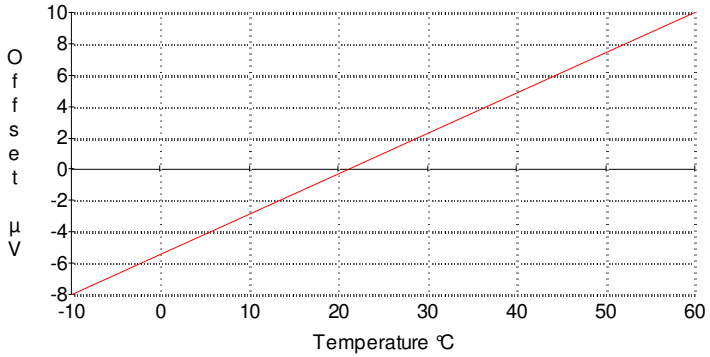
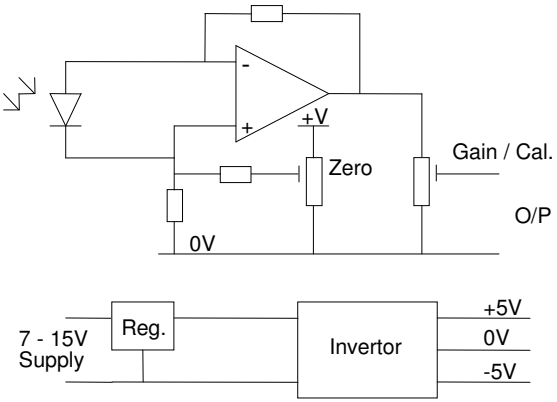



Figure 7



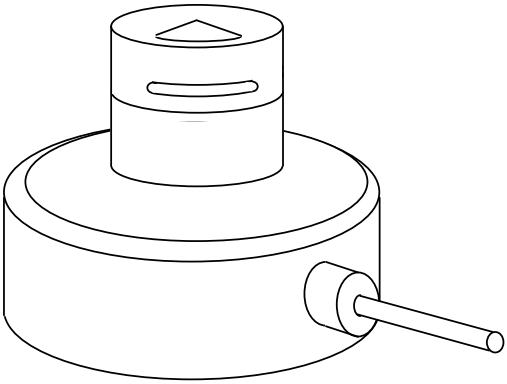

DA211-Cos Wiring

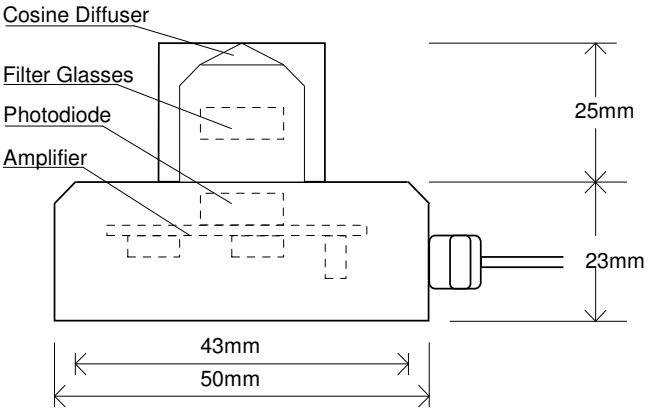
| | | |
|---|---|---|
| Supply (+) | ------ | Red |
| Supply (-) | ------ | Yellow |
| Output (+) | ------ | Blue |
| Output (-) | ------ | Green |

NOTE: Do not link Output (-) to Supply (-) on data logger.
Do not connect cable screen to data logger.

# 6. OUTLINE DRAWINGS

DA211-Cos Series Detector





# 7. CARE AND MAINTENANCE

LOOKING AFTER THE DETECTOR

1. The DA211-Cos detector should be cleaned using a moist cloth with detergent, solvent or alcohol.

2. The diffuser on the detector should be kept clean at all times.

3. The detector is a precision instrument, protect it from shocks.

4. Avoid supporting the detector by the cable.

# 8. ENVIRONMENTAL CARE, RECYCLING AND DISPOSAL

WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT

The purpose of the European Commission WEEE directive (Waste Electrical and Electronic Equipment; 2002/96/EC) is to ensure that electrical and electronic products are recycled using the best treatments, recovery and recycling techniques that are currently available. This is so that high health standards and a lasting environmental protection can be achieved and maintained.

This product has been designed and manufactured using high quality materials and components, many of which can be recycled and reused.

Please remember to observe the local regulations that govern both the disposal of the packaging materials accompanying this product and any used batteries.

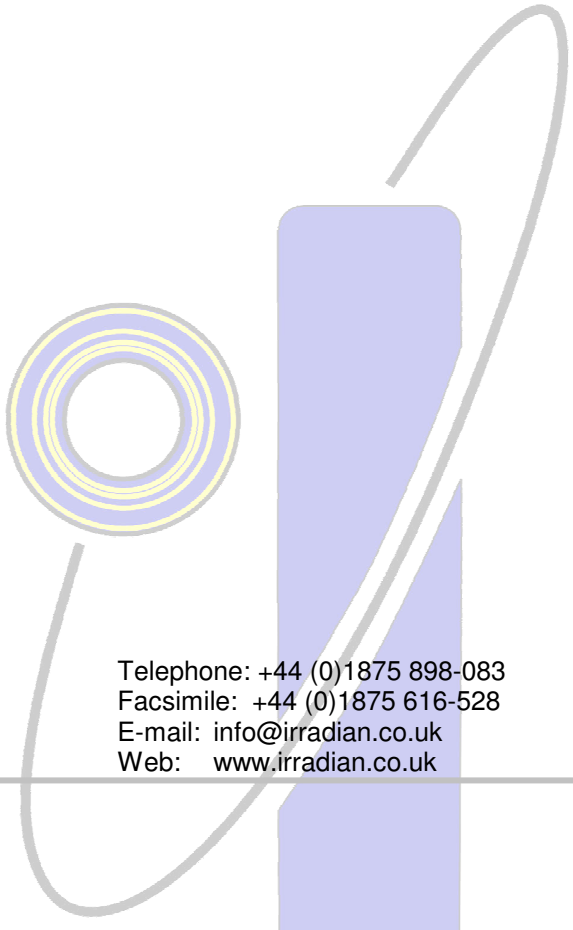
**DO NOT DISPOSE OF THIS PRODUCT IN YOUR GENERAL WASTE BIN.**

Please inform yourself about your local WEEE collection system which is available for electrical and electronic products that are marked with the symbol shown here.

When disposing of this meter, please use one of the following options:

1. Use your local designated WEEE collection facilities to dispose of the complete product (including cables, detectors, filters & accessories).

2. Return the complete product back to Irradian, marking it clearly as intended for WEEE disposal.



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