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# WATERPROOF UV DETECTORS WITH PRE-AMPLIFIERS

MODEL DA221-Cos

USER HANDBOOK



DA221A-Cos  
DA221B2-Cos  
DA221B3-Cos  
DA221AB-Cos

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 **IRRADIAN**  
Light Measurement Systems & Calibration



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# WATERPROOF UV DETECTORS WITH PRE-AMPLIFIERS

MODEL DA221-Cos

**USER HANDBOOK**

**CONTENTS:**

1. Introduction
2. Specification
3. Spectral Response
4. Cosine Angular Response
5. Circuits & Connections
6. Outline Drawings
7. Care and Maintenance
8. Environmental Care, Recycling and Disposal

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# 1. INTRODUCTION

## WATERPROOF UV DETECTORS WITH PRE-AMPLIFIERS

Irradian's DA221-Cos range of data logger compatible ultra-violet detectors comprise of an ultra-violet sensitive photodiode detector with filter glasses and a transimpedance amplifier, providing a voltage output. Each detector is sealed in a waterproof enclosure and operates from a single rail power supply.

Models in the DA221-Cos series include a UVA detector with peak response at 365nm, a UVB2 and narrower bandwidth UVB3 detector with peak responses at 311nm and a broad band UVAB detector with a peak at 352nm.

Key design features include:

- Good cosine response
- All aluminium body with weather resistant anodising
- High stability photodiodes
- Internal calibration resistor, adjustable for annual recalibration

Four models of sealed UV detectors are available:

UVA:	Model DA221A-Cos
UVB:	Model DA221B2-Cos Model DA221B3-Cos
UVAB	Model DA221AB-Cos

## 2. SPECIFICATION

Models	Region	Figure	$\lambda_{\text{peak}}$	FWHM
A-Cos	UVA	1	$365 \pm 2\text{nm}$	$35 \pm 2\text{nm}$
B2-Cos	UVB2	2	$311 \pm 2\text{nm}$	$19 \pm 2\text{nm}$
B3-Cos	UVB3	3	$311 \pm 2\text{nm}$	$14 \pm 2\text{nm}$
AB-Cos	UVAB	4	$352 \pm 5\text{nm}$	$84 \pm 5\text{nm}$

Cosine Corrected Input: Within  $\pm 5\%$  upto  $70^\circ$ . Refer to Figure 5.

Sensitivity\*:  $10\text{mV per W}\cdot\text{m}^{-2}$

\* Other ranges available on request.

Calibration:  $\pm 7.5\%$  Traceable to NPL standards.

Linearity:  $<1\%$  Error

Operating Temperature Range:  $-10$  to  $+60^\circ\text{C}$

Storage Temperature Range:  $-20$  to  $+60^\circ\text{C}$

Temperature Dependence: Sensitivity  $<0.1\% / ^\circ\text{C}$  (typical)  
Amplifier DC offset Refer to Figure 6.

Input Supply: 7 to 15V DC

Current Consumption:  $<2\text{mA @}12\text{V}$

Warm Up Period: 10 seconds

Cable: 5 meter screened multicore.  
(other lengths available)

Mounting: Two M4 tapped holes on a 43mm PCD.

Housing: Black anodised aluminium, also  
available in stainless steel.

Enclosure Rating: Waterproof to 10 meters depth.

Weight: 230g (excluding cable)

### 3. SPECTRAL RESPONSE

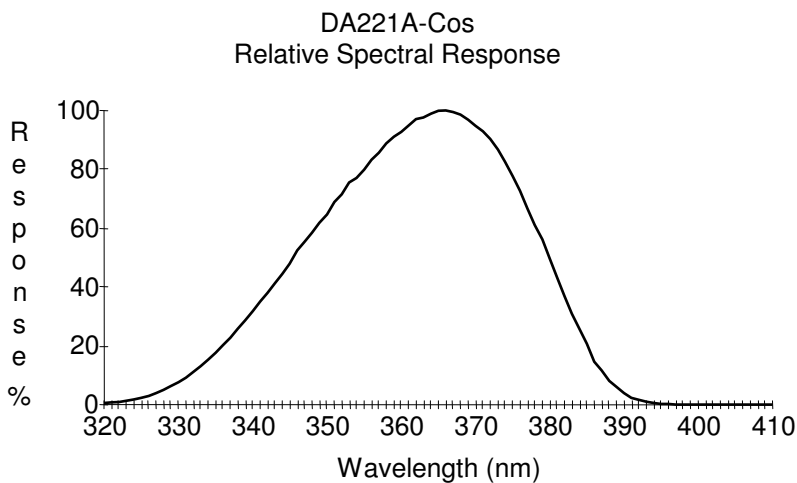


Figure 1

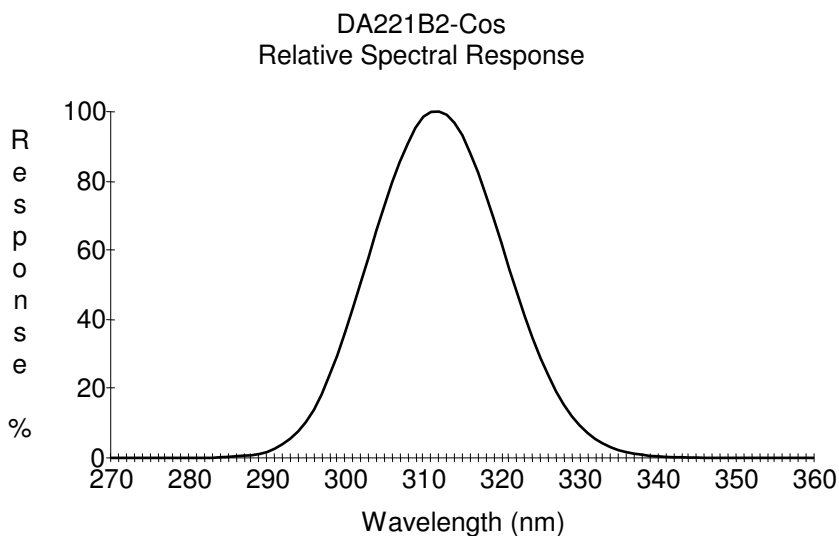


Figure 2

### 3. SPECTRAL RESPONSE (continued):

DA221B3-Cos  
Relative Spectral Response

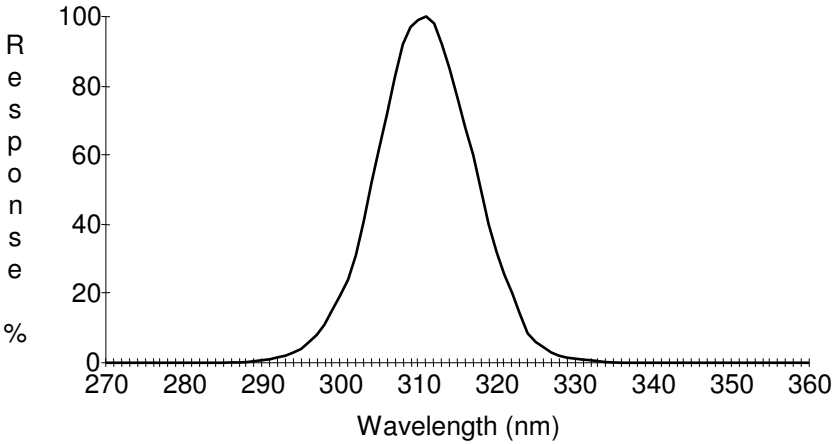


Figure 3

DA221AB-Cos  
Relative Spectral Response

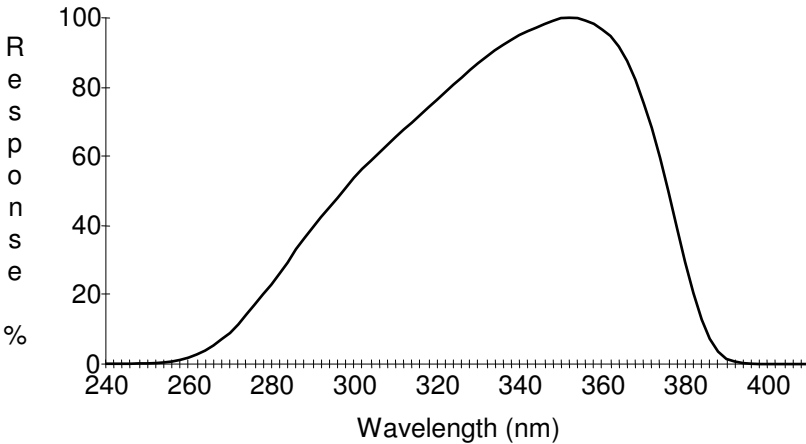


Figure 4



## 4. COSINE ANGULAR RESPONSE

### COSINE CORRECTED INPUT

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

Maximum error is less than  $\pm 5\%$  from true response to  $70^\circ$  from normal incidence.

Typical DA221-Cos  
Cosine Angular Response

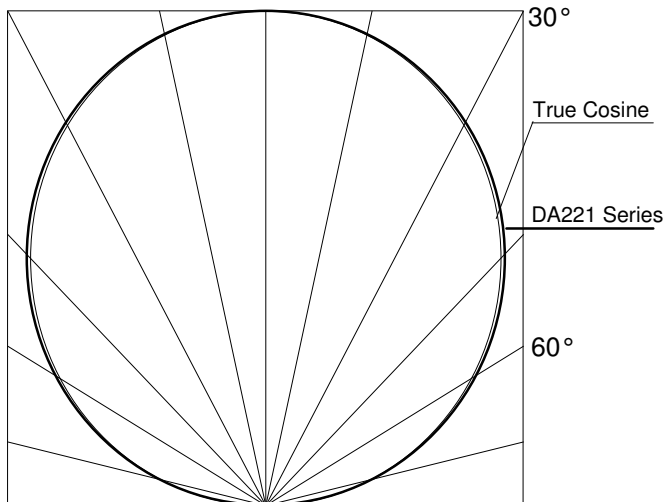


Figure 5

# 5. CIRCUITS & CONNECTIONS

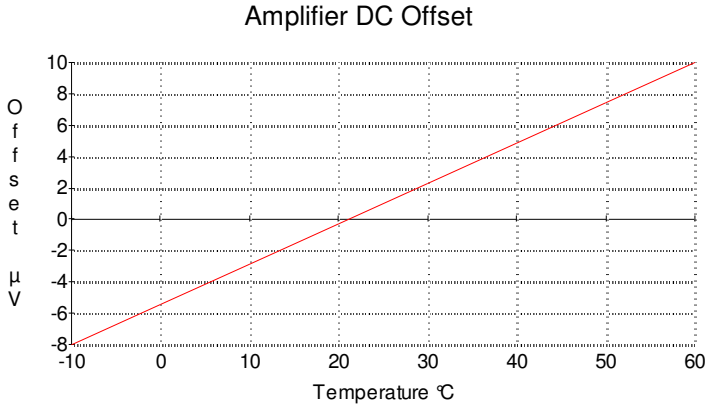
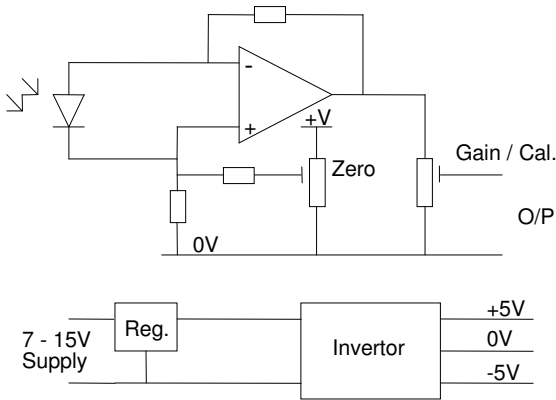


Figure 6



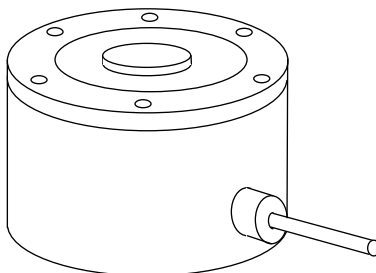
### DA221-Cos Wiring

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

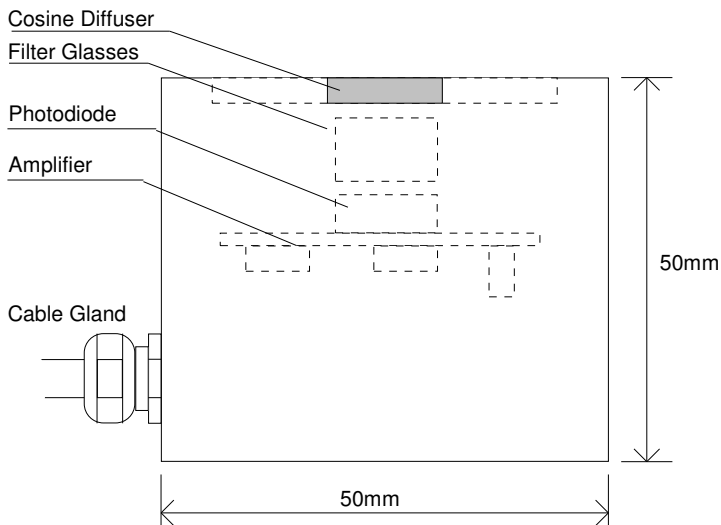
NOTE: Do not link Output (-) to Supply (-) on data logger.  
Do not connect cable screen to data logger.

## 6. OUTLINE DRAWINGS

DA221-Cos Series Detector



DA221-Cos Series Schematic



## 7. CARE AND MAINTENANCE

### LOOKING AFTER THE DETECTOR

1. The DA221-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.**

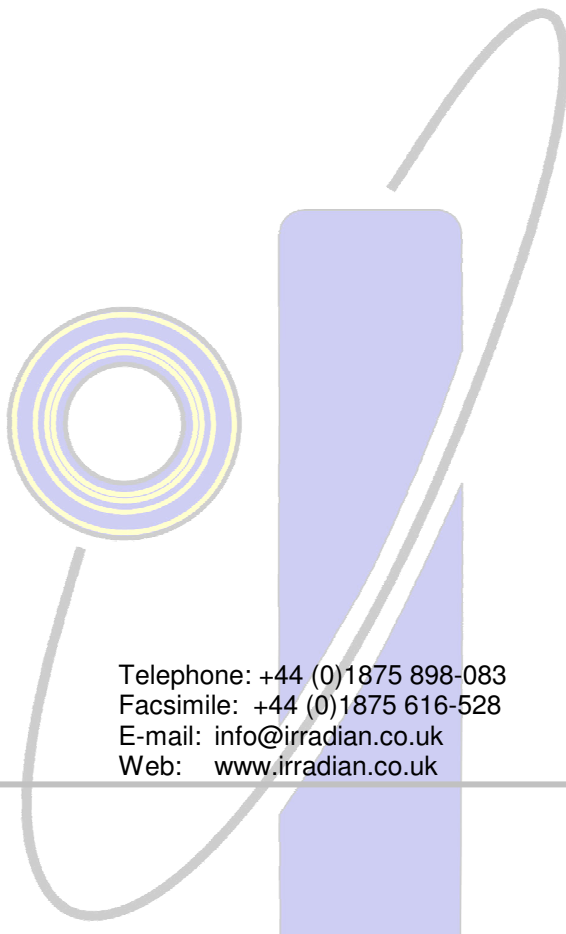
Please inform yourself about your local WEEE collection system which is available for electrical and electronic products that are marked with the symbol shown here.

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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