ANALOGUE DETECTION ASSEMBLY P25A SERIES

SENS - TECH

DESCRIPTION

The P25A detection assembly has been designed for analogue measurements over a bandwidth of 0 to 100 MHz. It comprises a 25 mm diameter, fast, end window photomultiplier, a - HV power supply and a fast, high gain, dc coupled, transimpedance amplifier. A photomultilier with a bialkali photocathode is used for blue-green detection, and an S20 photocathode is used for red detection. All are encapsulated within a cylindrical mumetal* case.

The effective photocathode diameter is 22 mm and the pmt HV is set by applying an external voltage, one-thousandth of the required voltage, to the control input.

APPLICATIONS

- Laser scanning
- Spectrometry
- Radiometry
- Particle counting
- Particle sizing

FEATURES

- Simplicity of operation
- Compact cylindrical assembly
- Electrostatic and magnetic shielding
- Bandwidth of 100 MHZ
- Works into a 50Ω matched coaxial cable
- Conversion gain of 4V per 100µA of anode current

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CHARACTERISTICS

PHOTOCATHODE TYPE Bialkali or S20	**OUTPUT RISE AND FALL TIME** 3 ns
PHOTOCATHODE ACTIVE DIAMETER 22 mm	**OUTPUT IMPENDANCE** 50 Ω
SPECTRAL RESPONSE RANGE See curves	**OUTPUT SIGNAL (UNTERMINATED)** 0 to +3 V
PEAK RESPONSIVITY See curves	**OUTPUT SIGNAL (TERMINATED INTO 50Ω)** 0 to +1.5 V
AMPLIFIER CONVERSION GAIN 4 V / 100 µA	**HV CONTROL SENSITIVITY** -1000 V / V
SENSITIVITY AT 400 NM, PMT G = 10 340 mV / nW	**HV CONTROL VOLTS (MAX*)** 1.8 V
BANDWIDTH (6DB) 0 - 100 MHz	**WARM UP TIME** < 10s
AMPLIFIER NOISE (TYP) 6 mV rms	**OPERATING POSITION** ANY
AMPLIFIER OFFSET (TYP) 1 mV	**FINISH** Matt black
WEIGHT 285g	
POWER INPUT **+5 V (+4.75 to +5.25)** 80 mA **-5 V (-4.75 to -5.25)** 20 mA	**TEMPERATURE** **Operating** +5 °C to +55 °C **Storage** -40 °C to +55 °C

* subject to not exceeding the rated gain of the pmt

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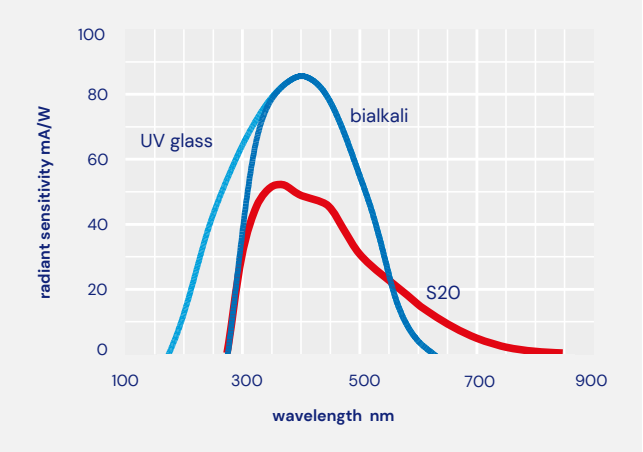
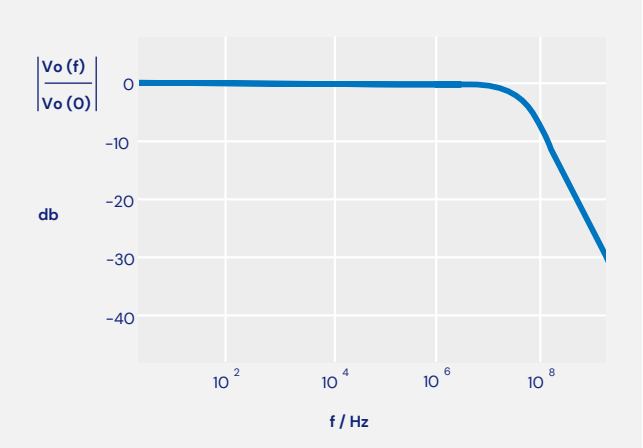
PHOTOCATHODE SPECTRAL RESPONSE



FREQUENCY RESPONSE



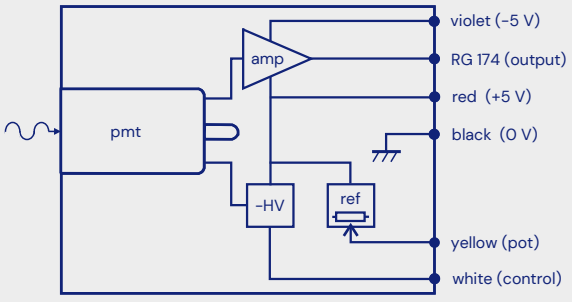
INSTALLATION AND OPERATION

Each module is supplied with test data. Wherever possible installation should be carried out in subdued light. Exposure to strong lights, particularly those containing a high uv content, can result in a temporary increase in dark counts during subsequent operation.

Remove the protective cap from the module. If necessary, the photomultiplier window can be cleaned using a lens tissue moistened with alcohol. Do not use any other solvent.

Mount the module and make power input and signal connections. The signal lead should be terminated into 50 when observing fast transients (<50 ns).

FUNCTIONAL DIAGRAM



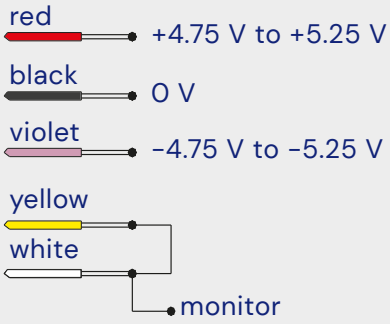
INSTALLATION AND OPERATION

The internal high voltage supply to the photomultiplier tube can be controlled used the internal pot, accessed from the back face of the module, or by applying an external control voltage. Make connections to the yellow (pot) and white (control) wires, as shown in the table below, according to your choice of control method.

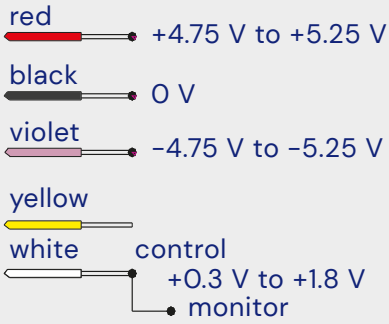
PROGRAMMING OPTIONS FOR INTERNAL HIGH VOLTAGE POWER SUPPLY

The internal HV supply may be controlled by:

A. Connecting the yellow lead of the internal pot to the white lead



B. Applying an external reference voltage to the white lead



Monitor: 1/1000 of voltage applied to photomultiplier

When using the internal pot the photomultiplier tube high voltage is increased by clockwise rotation. Monitor the photomultiplier tube high voltage with a voltmeter connected between the white (control) and black (0V) wires. The photomultiplier tube voltage is 1000 x the voltage on the control (white) wire. Take care not to exceed the maximum rated voltage for the photomultiplier tube, as specified in the module test data.

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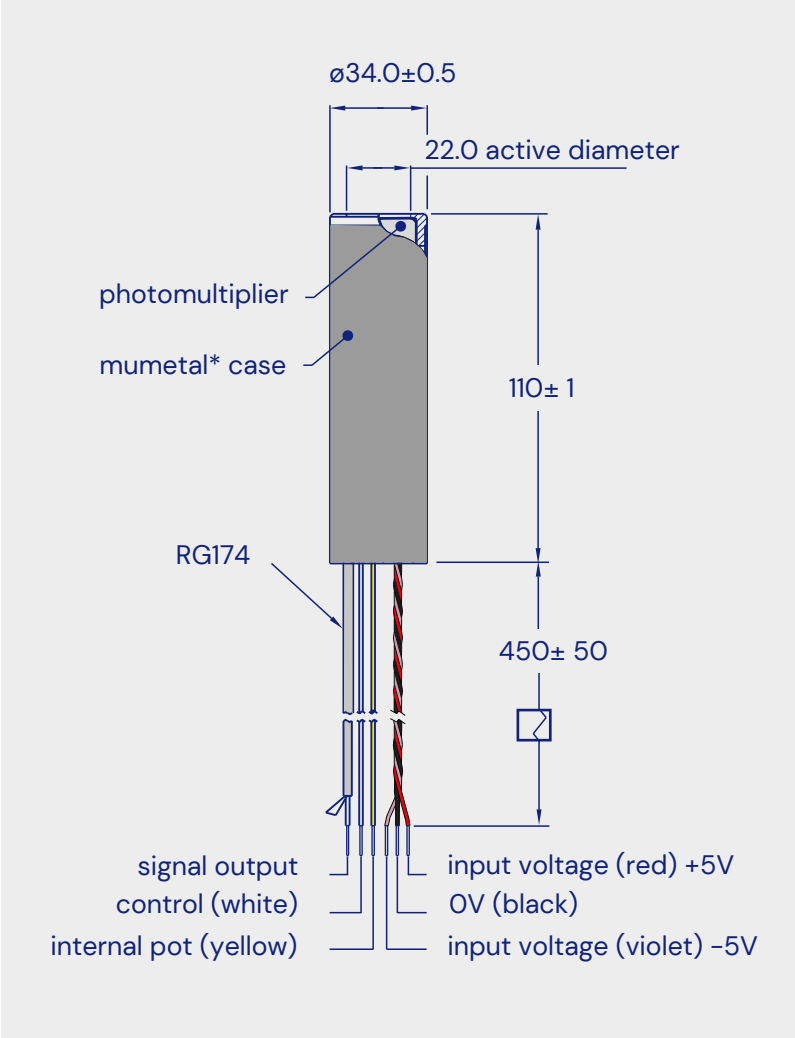
OUTLINE DRAWING MM



WARNING

The pmt cathode is operated at -HV. To guarantee stable performance and for safety reasons, the entire window should be isolated by a distance of at least 3mm from any ground plane or components. The use of PTFE for insulation is recommended.

Do not expose the photocathode to strong lights while the module is energised.

Operation beyond the maximum ratings, or reversal of the input voltage may result in loss of performance or permanent damage to the product. The HV must not exceed the maximum rated voltage of the photomultiplier as stated on the test ticket supplied.