

# PHOTOMULTIPLIER MODULE P25N SERIES

## DESCRIPTION

The P25N series is a range of photomultiplier modules that can be used for all three modes of photomultiplier operation – pulse counting, analogue detection or photon counting.

Each comprises a selected 25 mm diameter end-window photomultiplier tube with a 22 mm effective photocathode diameter, and an active voltage divider powered by an efficient –HV power supply. A photomultiplier 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, providing a high level of immunity from the effects of external magnetic fields.

## APPLICATIONS

These detectors are suitable for portable, battery powered instruments. They are also used for university research and industrial prototype instrument development.



The signal lead is connected directly to the anode of the photomultiplier, allowing the freedom to work these modules into a range of electronic circuitry. The –HV is set by applying an external voltage, one-thousandth of the required voltage to the control input.

## FEATURES

- Compact cylindrical geometry
- Direct connection to the photomultiplier anode
- Electrostatic and magnetic shielding
- Standard window: borosilicate
- UV window option

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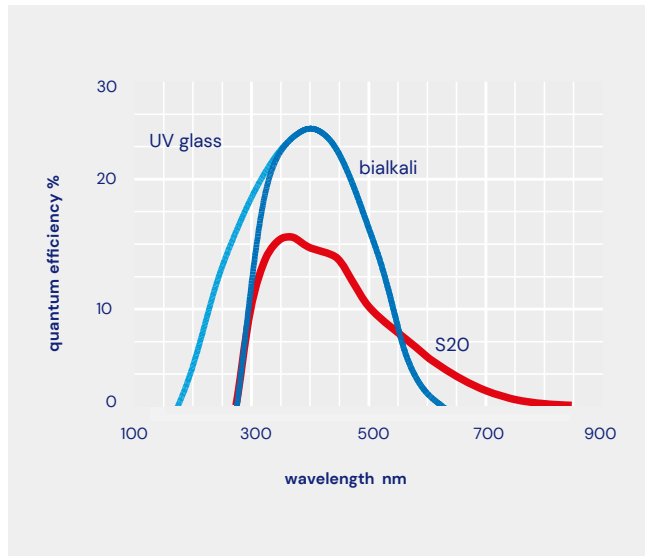
## CHARACTERISTICS

<b>PHOTOCATHODE TYPE</b> Bialkali or S20	<b>OUTPUT PULSE INTO 50 Ω TERMINATED CABLE</b>
<b>PHOTOCATHODE ACTIVE DIAMETER</b> 22 mm	<b>SINGLE ELECTRON RISE TIME</b> 1.8 ns
<b>SPECTRAL RESPONSE RANGE</b> See curves	<b>SINGLE ELECTRON PULSE WIDTH (FWHM)</b> 3.1 ns
<b>PEAK QE (TYP)</b> See curves	<b>PULSE OUTPUT LINEARITY ± 5%</b> 0 to 5 mA
<b>DC LINEARITY (± 2%)</b> 0 to 100 μA	<b>INPUT VOLTAGE RANGE</b> +4.75 V to +6 V
<b>WARM UP TIME</b> 10s	<b>INPUT CURRENT</b> <60 mA (*)
<b>WEIGHT</b> 230g	<b>HV CONTROL VOLTAGE RATIO</b> 1000:1
<b>OPERATING POSITION</b> ANY	<b>TEMPERATURE</b> <b>Operating</b> +5 °C to +55 °C <b>Storage</b> -40 °C to +55 °C
<b>FINISH</b> Matt black	

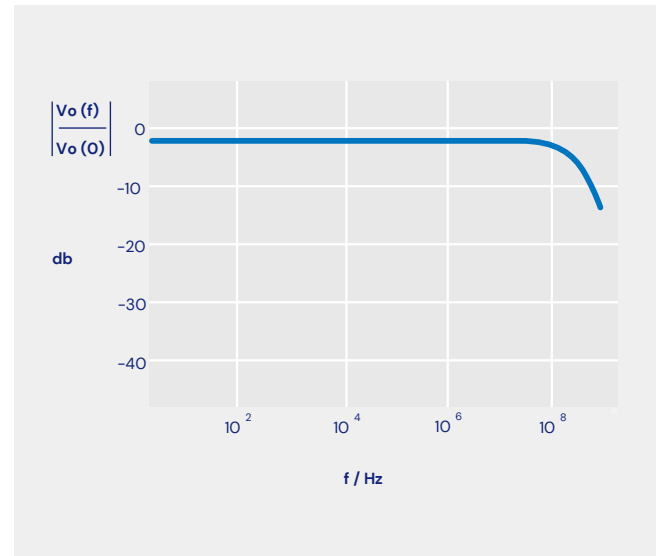
\* Actual power dissipation depends on HV setting and anode current

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## PHOTOCATHODE SPECTRAL RESPONSE



## FREQUENCY RESPONSE INTO 50 Ω



## ORDERING INFORMATION

WAVELENGTH (NM)	CATHODE TYPE	PART NO.
170-630	UV version	P25N-01
280-630	Bialkali	P25N
280-850	S20	P25N-02

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## INSTALLATION AND OPERATION

Each module is supplied with test data. Wherever possible carry out installation 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, clean the photomultiplier window using a lens tissue moistened with alcohol. Do not use any other solvent.

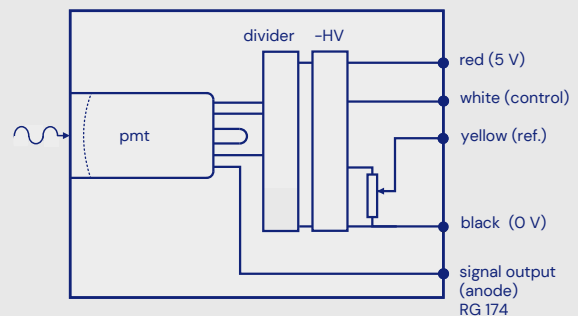
Mount the module and make power input and signal connections. Do not expose the photomultiplier tube photocathode to strong lights while the module is energised.

The internal high voltage supply to the photomultiplier tube can be controlled using 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.

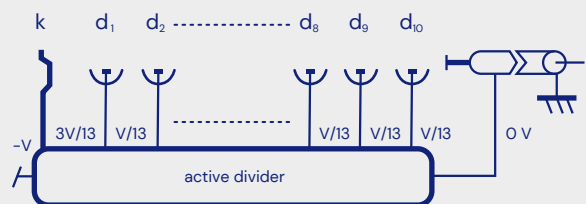
When using the internal pot the photomultiplier tube high voltage is increased by clockwise

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.

### FUNCTIONAL DIAGRAM



### ACTIVE DIVIDER DIAGRAM



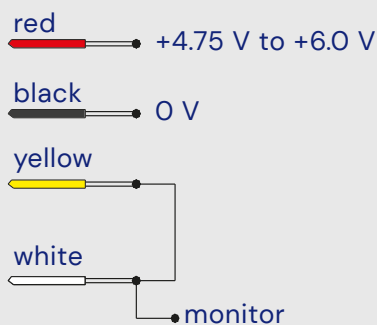
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Output pulses from this module are extremely fast and proper termination of the output coaxial cable is required. The shortest possible lead length between the module and external electronics is always advised and good earthing procedures must be respected. Where the signal lead is longer than 200 mm, it should be terminated in 50  $\Omega$ . These precautions are particularly relevant when low threshold discriminators are employed.

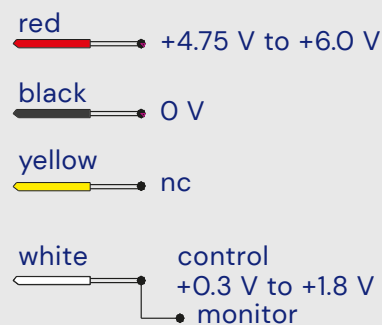
## PROGRAMMING OPTIONS FOR INTERNAL HIGH VOLTAGE POWER SUPPLY

### A. Internal potentiometer

(access from end face of package)



### B. External voltage

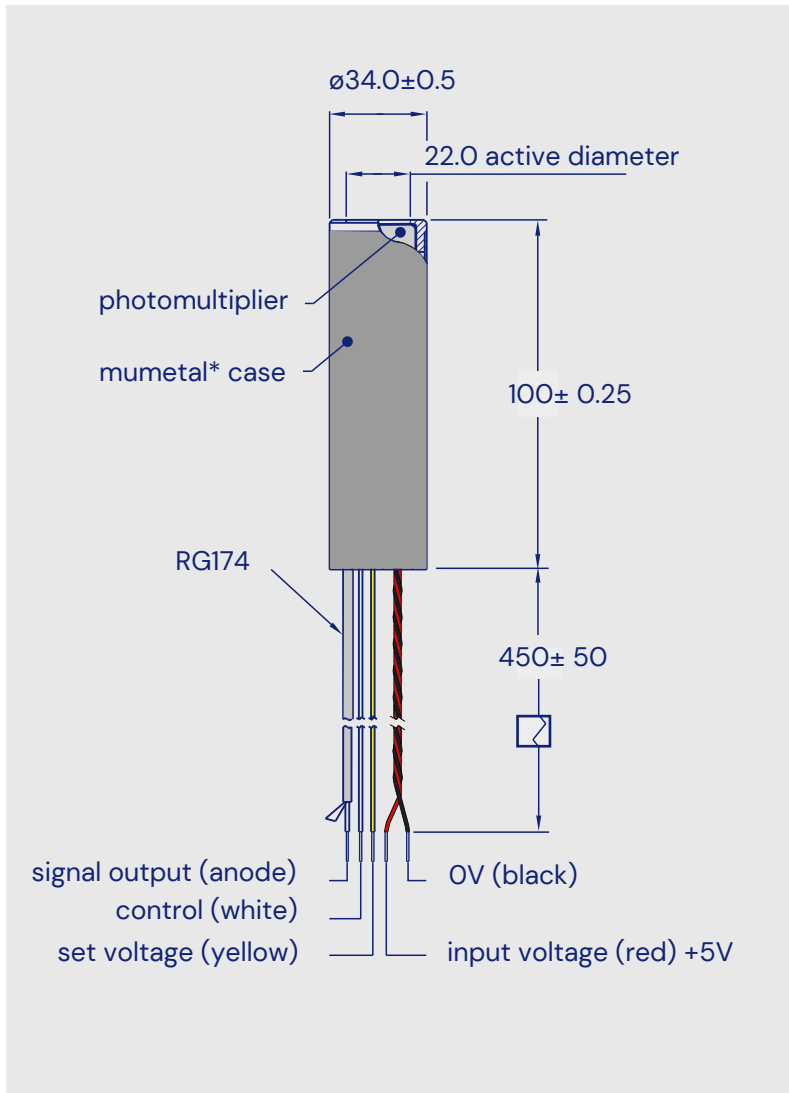


nc: No connection - isolated lead

Monitor: 1/1000 of voltage applied to photomultiplier

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## OUTLINE DRAWING MM



## WARNING

The photomultiplier cathode is operated at -HV. To guarantee stable performance and for safety reasons, isolate the entire window by a distance of at least 2 mm from any ground plane of components. The use of PTFE for insulation is recommended.

Do not attempt to repair or dismantle this product. High voltage used within the module presents an electric shock hazard.

Do not operate beyond the maximum ratings, or reverse the input voltage; this may result in loss of performance or permanent damage to the product.

\*mumetal is a registered trademark of Magnetic Shield Corporation



## **YOU MAY ALSO BE INTERESTED IN OTHER PHOTOMULTIPLIER MODULES**

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Sens-Tech photomultiplier modules provide the instrument designer with a wide range of high performance plug-and-play solutions for low and high light level detection and measurement. Modules are light tight and incorporate combinations of the following:

- Photomultiplier
- Power supply
- Voltage divider
- Electromagnetic screening
- Electrostatic screening
- Signal processing electronics
- Outputs include, USB, TTL, RS232, Voltage, Current

Benefits include:

- Shorter time-to-market
- Cost effectiveness
- Applications support long after the sale
- Plug-and-play versions
- User friendly
- Physically robust
- Long term stability of operation
- Reduced susceptibility to e-m interference
- User protected package with encapsulated HV
- Adjustable versions offering user control

Photomultiplier Modules are suitable for the following applications:

- Photon counting
- Pulsed light
- Analogue detection



[Click here for further information](#)



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If your requirement demands a unique module please discuss this with us.