

analogue detection assembly P30A series

1 description

The P30A photodetector module has been designed for analogue measurements over a bandwidth of 0 to 30MHz. It comprises a 30 mm diameter, fast, end window photomultiplier, a -HV power supply and a fast, high gain, dc coupled, transimpedance amplifier. 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.

The effective photocathode diameter is 25 mm and the pmt HV is set by applying an external voltage, one-thousandth of the required voltage, to the control input.

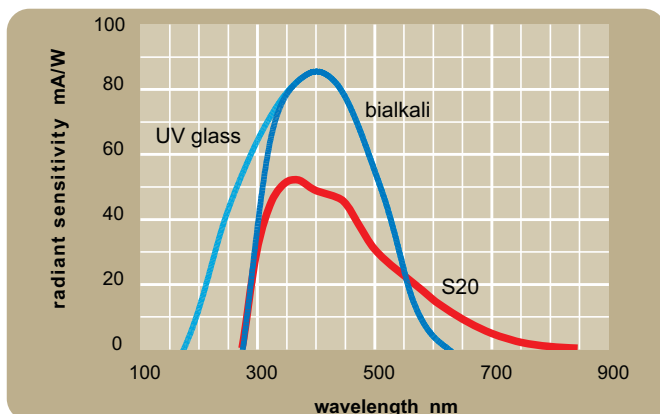
2 applications

- laser scanning
- spectrometry
- radiometry
- particle counting
- particle sizing
- electron microscopy

3 features

- simplicity of operation
- compact cylindrical assembly
- electrostatic and magnetic shielding
- bandwidth of 30 MHz
- works into a 50 Ω matched coaxial cable
- conversion gain of 10 V per 100 μ A of anode current

4 photocathode spectral response

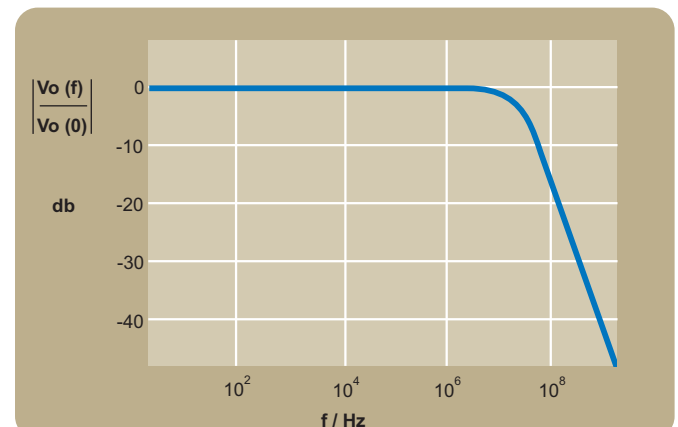


5 characteristics

photocathode type	bialkali or S20
photocathode active diameter	25 mm
spectral response range	see curves
peak QE (typ)	see curves
amplifier conversion gain	10 V / 100 μ A
sensitivity at 400 nm, pmt g = 10^5	850mV / nW
bandwidth (6 db)	0 - 30 MHz
amplifier noise (typ)	2 mV rms
amplifier offset (typ)	1 mV
output rise and fall time	12 ns
output impedance	50 Ω
output signal (unterminated)	0 to +3 V
output signal (terminated into 50 Ω)	0 to +1.5 V
power input	
+5 V (+4.75 to +5.25)	80 mA
-5 V (-4.75 to -5.25)	20 mA
HV control sensitivity	-1000 V / V
HV control volts (max ⁽¹⁾)	+1.8 V
warm up time	< 10 s
temperature (operating)	+5 $^{\circ}$ C to +55 $^{\circ}$ C
(storage)	-40 $^{\circ}$ C to +55 $^{\circ}$ C
weight	285 g
operating position	any
finish	mat black

⁽¹⁾ subject to not exceeding the rated gain of the pmt

6 frequency response

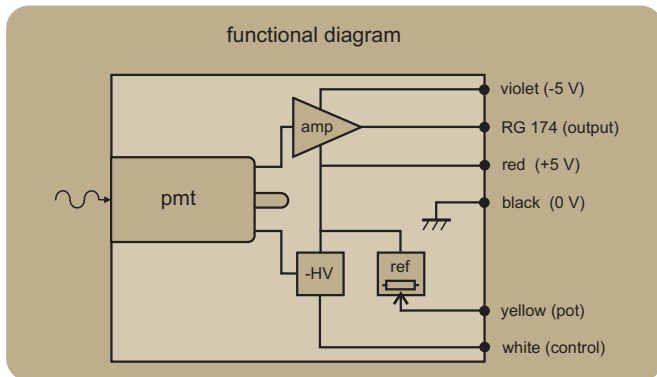


7 installation and operation

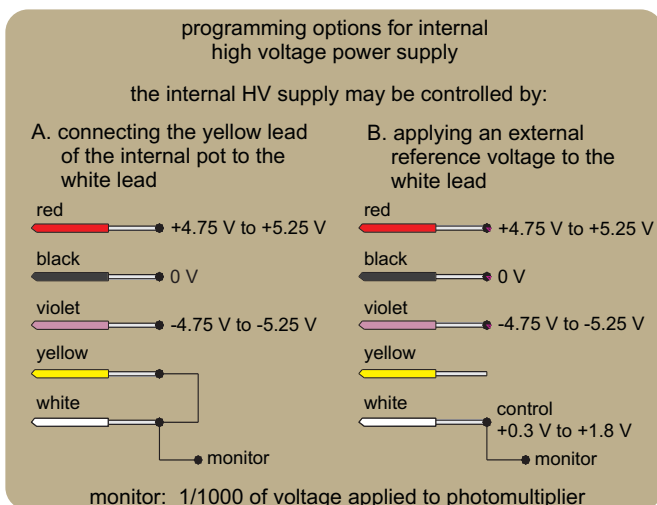
Each module is supplied with test data. Wherever possible installation should be carried out in subdued light. Exposure to strong lights, particularly those containing a high uv content, can result in a temporary increase in dark counts during subsequent operation.

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).

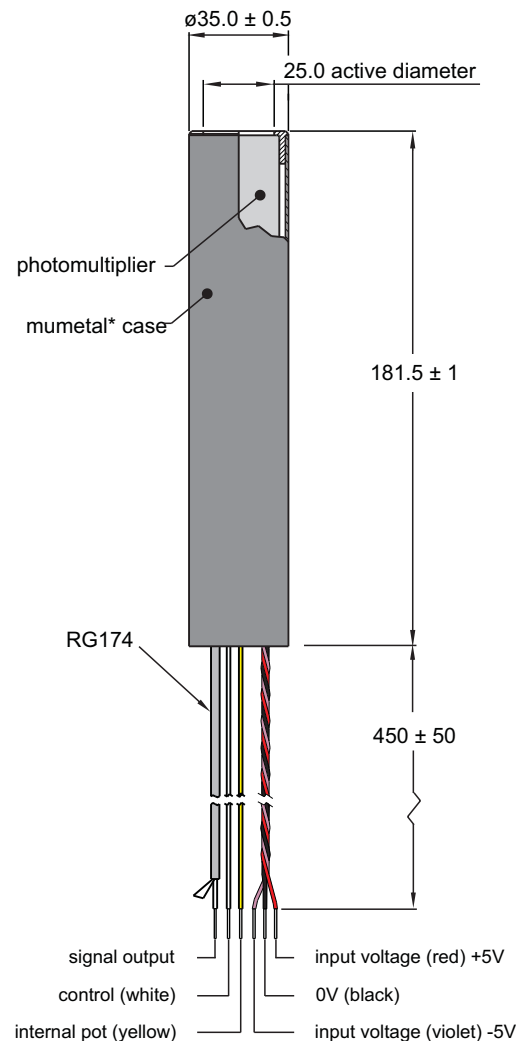


The internal high voltage supply to the photomultiplier tube can be controlled used the internal pot, accessed from the back face of the module, or by applying an external control voltage. Make connections to the yellow (pot) and white (control) wires, as shown in the table below, according to your choice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



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 package test data.

8 outline drawing mm



9 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 3 mm 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.

*mumetal is a registered trademark of Magnetic Shield Corporation