photodetector package
P30CWAD5

1 description

The P30CWAD5 photodetector package comprising a type 9125B, 30 mm diameter end window photomultiplier tube with blue-green sensitive bialkali photocathode and ultra-low dark counts, a negative high voltage power supply and a high speed amplifier-discriminator. All are encapsulated within a cylindrical mumetal case, providing a high level of immunity from the effects of external magnetic fields. Low voltage and signal output connections to the package are by axial flying leads.

The photomultiplier tube voltage is set by applying an external voltage, one thousandth of the required high voltage, to the control wire.

2 applications

- intended for ultra-low light measurement applications requiring single photon detection
- ideal for use in battery powered portable instruments

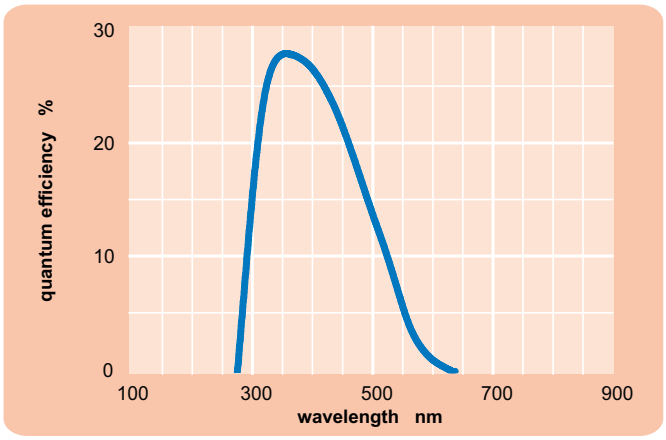
3 features

- simplicity of operation
- compact cylindrical assembly
- electrostatic and magnetic shielding
- operates from low voltage supply
- preset discriminator level
- fully enclosed high voltages
- only 175 mW total power dissipation (typical)
- 20 MHz count rate capability
- wide dynamic range

4 characteristics

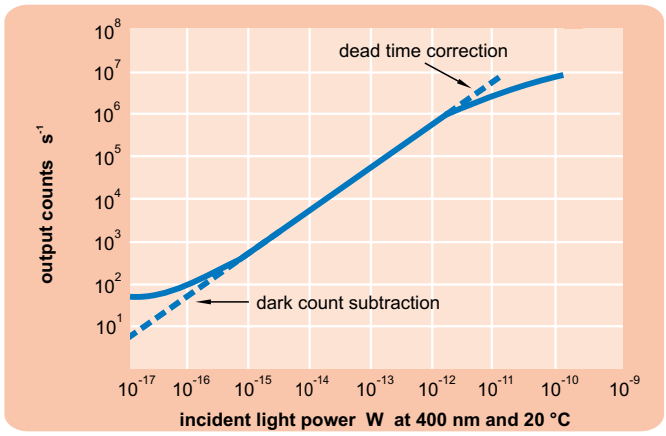
photocathode type	bialkali
photocathode active diameter	25 mm
spectral response range	280 to 630 nm, see curve
peak QE at 400 nm	28 %
output pulse	TTL high level
output pulse amplitude (unterminated)	5 V
output pulse rise time	2 ns
output pulse fall time	2 ns
output impedance	50
discriminator level	-2 mV
pulse pair resolution	23 ns
dark counts at 20 °C (typ.)	100 s^{-1}
(max.)	200 s^{-1}
power input at 10^6 s^{-1}	+5 V, 35 mA
tube voltage/control volt. ratio	1000:1
warm up time	less than 10 s
ratings	
input voltage	+4.75 V to +6.0 V
temperature (operating)	+5 °C to +55 °C
(storage)	-40 °C to +55 °C
weight	285 g
operating position	any
finish	matt black

5 photocathode spectral response



6 dynamic range

Extended dynamic range can be obtained by dark count subtraction and by dead time correction to compensate for departure from linearity at high count rates due to pulse pile up.



7 installation and operation

Each package 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 package. If necessary, the photomultiplier window can be cleaned using a lens tissue moistened with alcohol. Do not use any other solvent.

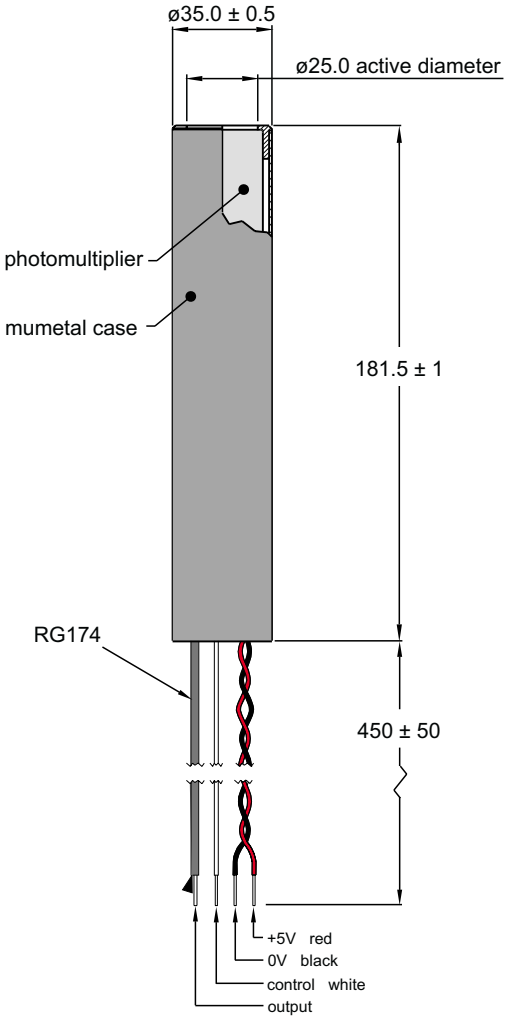
Mount the package and make power input and signal connections. Where the signal lead is longer than 200 mm, it should be terminated into 50 Do not expose the photomultiplier tube photocathode to strong lights while the package is energised.

Dead time may be corrected for, as follows:-

$$N = n/(1-nT)$$

where: N is the true count rate (s^{-1}),
n is the measured count rate (s^{-1}),
T is the count rate correction factor (2.3×10^{-8} s).

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.

No attempt must be made to repair or dismantle this product. High voltage used within the package may present an electric shock hazard.

Operation beyond the maximum ratings, or reversal of the input voltage may result in loss of performance or permanent damage to the product.

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DS_P30CWAD5 Issue 3
24 September 2001