

# photodetector module P30PC

## 1 description

The P30PC is a photodetector module configured for photon counting. It comprises a selected 30 mm diameter end window photomultiplier tube with a blue-green sensitive bi-alkali photocathode with low dark counts, a positive 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 operating voltage is factory set.

## 2 applications

These modules are intended for low light measurement applications requiring single photon detection. Their low power consumption makes them ideal for use in battery powered portable instruments. Applications include:

- lidar
- luminometers
- spectrometry

## 3 features

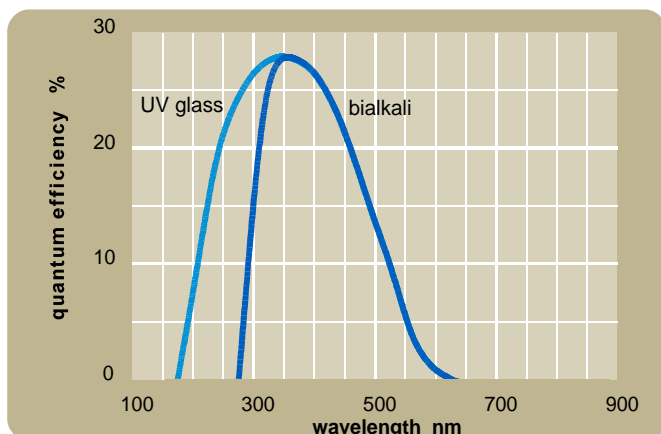
- easy to operate
- compact cylindrical assembly
- electrostatic and magnetic shielding
- UV window option
- 100 MHz count rate capability
- operates from low voltage supply
- preset discriminator level
- fully enclosed high voltages
- only 550 mW total power dissipation (typical)
- optional prescaler factory set to divide the output count rate by any chosen integer from 2 to 16.



## 4 characteristics

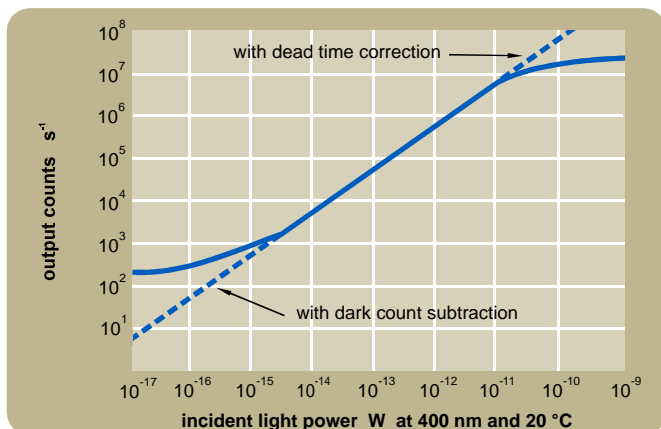
<b>photocathode type</b>	bi-alkali
<b>photocathode active diameter</b>	25 mm
<b>spectral response range</b>	see curves
<b>peak QE (typ)</b>	see curves
<b>output pulse</b>	TTL high level
<b>output pulse rise/full time</b>	2 ns
<b>output pulse amplitude (unterminated)</b>	5 V
<b>output impedance</b>	50 Ω
<b>discriminator level</b>	-2 mV
<b>dark counts at 20 °C (typ.) (max.)</b>	100 s <sup>-1</sup> 200 s <sup>-1</sup>
<b>power input at 10<sup>6</sup> s<sup>-1</sup></b>	+5 V, 110 mA
<b>warm up time</b>	less than 2 s
<b>input voltage</b>	+4.75 V to +5.25 V
<b>temperature (operating)</b>	+5 °C to +55 °C
<b>(storage)</b>	-40 °C to +55 °C
<b>humidity (non-condensing)</b>	93 % RH maximum at 30 °C
<b>weight</b>	285 g
<b>operating position</b>	any
<b>finish</b>	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 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. Where the signal lead is longer than 200 mm, it should be terminated into 50Ω. Do not expose the photomultiplier tube photocathode to strong lights while the package is energised.

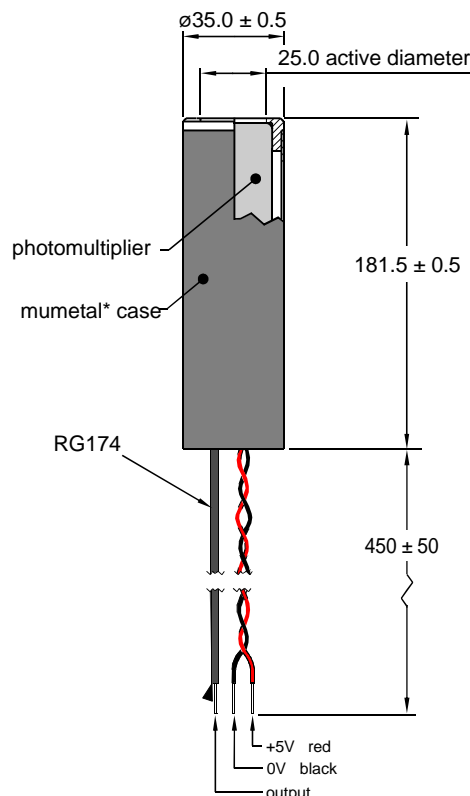
Dead time may be corrected for, as follows:

$$N = pn / (1 - nTp)$$

where:  $N$  is the true count rate ( $s^{-1}$ ),  
 $n$  is the measured count rate ( $s^{-1}$ ),  
 $T$  is the count rate correction factor (typically  $2.0 \times 10^{-8}$  s)  
 $p$  is the prescaler factor if this option is included.

The prescaler factor  $p$  is factory set from 2 to 16 as agreed.

## 8 outline drawing mm



## 9 warning

No attempt must be made to repair or dismantle this product. High voltage used within the module 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.

\*mumetal is a registered trademark of Magnetic Shield Corporation