

# 29 mm (1.13") photomultiplier

## 9900B series data sheet

### 1 description

The 9900B is a 29 mm (1.13") diameter, end window photomultiplier with sidewall sensitivity for wide angle light detection. It has an enhanced-green sensitive bialkali photocathode and 11 high gain, high stability, SbCs dynodes of box and grid design.

### 2 applications

- x-ray & gamma-ray spectroscopy
- photon counting of bio- and chemi-luminescent samples

### 3 features

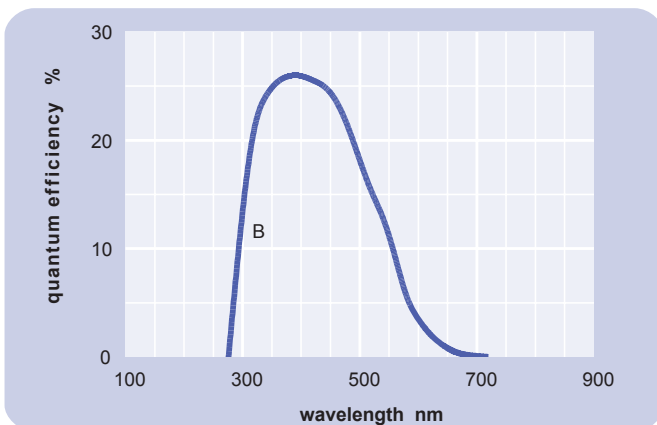
- high gain
- low operating voltage
- good SER
- good pulse height resolution
- $2\pi$  active area

### 4 window characteristics

9900B borosilicate	
spectral range *(nm)	280 - 680
refractive index ( $n_d$ )	1.49
K (ppm)	300
Th (ppb)	250
U (ppb)	100

\* wavelength range over which quantum efficiency exceeds 1 % of peak

### 5 typical spectral response curves

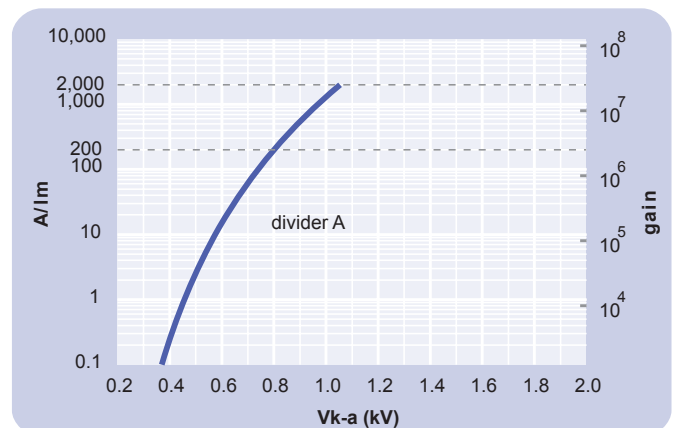


### 6 characteristics

	unit	min	typ	max
<b>photocathode: bialkali</b>				
active diameter	mm		25	
quantum efficiency at peak	%		26	
luminous sensitivity	$\mu\text{A/lm}$		80	
with CB filter		7	11	
with CR filter			7.5	
<b>dynodes: 11BGSbCs</b>				
<b>anode sensitivity in divider A:</b>				
nominal anode sensitivity	A/lm		200	
max. rated anode sensitivity	A/lm		2000	
overall V for nominal A/lm	V		800	1100
overall V for max. rated A/lm	V		1050	
gain at nominal A/lm	$\times 10^6$		2.5	
<b>dark current at 20 °C:</b>				
dc at nominal A/lm	nA		0.3	5
dc at max. rated A/lm	nA		3	
dark count rate	$\text{s}^{-1}$		300	
<b>pulsed linearity (-5% deviation):</b>				
divider A	mA		0.1	
<b>pulse height resolution:</b>				
single electron peak to valley	ratio		2	
<b>rate effect (<math>I_a</math> for <math>\Delta g/g=1\%</math>):</b>				
	$\mu\text{A}$		20	
<b>magnetic field sensitivity:</b>				
the field for which the output decreases by 50 %				
most sensitive direction	$\text{T} \times 10^{-4}$		2	
<b>temperature coefficient:</b>				
	$\% \text{ } ^\circ\text{C}^{-1}$		$\pm 0.5$	
<b>timing:</b>				
single electron rise time	ns		15	
single electron (fwhm)	ns		30	
transit time	ns		85	
<b>weight:</b>	g		55	
<b>maximum ratings:</b>				
anode current	$\mu\text{A}$			100
cathode current	nA			25
gain	$\times 10^6$			25
sensitivity	A/lm			2000
temperature	$^\circ\text{C}$	-30		60
V (k-a) <sup>(1)</sup>	V			2000
V (k-d1)	V			300
V (d-d) <sup>(2)</sup>	V			300
ambient pressure (absolute)	kPa			202

<sup>(1)</sup> subject to not exceeding max. rated sensitivity <sup>(2)</sup> subject to not exceeding max rated V(k-a)

### 7 typical voltage gain characteristics

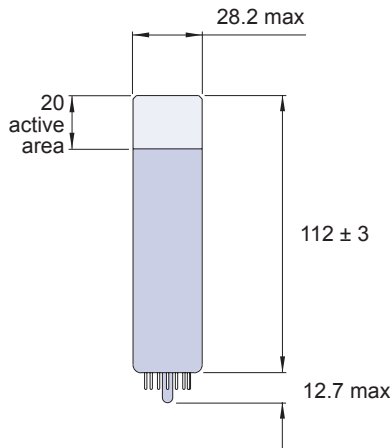


## 8 voltage divider distribution

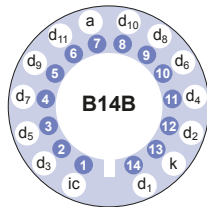
k	d <sub>1</sub>	d <sub>2</sub>	.....	d <sub>8</sub>	d <sub>9</sub>	d <sub>10</sub>	d <sub>11</sub>	a	
A	150V	R	.....	R	R	R	2R	R	Standard

Characteristics contained in this data sheet refer to divider A unless stated otherwise.

## 9 external dimensions mm



## 10 base configuration (viewed from below)



'ic' indicates an internal connection

Our range of B14B sockets, available for this series, includes versions with or without a mounting flange, and versions with contacts for mounting directly onto printed circuit boards.

## 11 ordering information

The 9900B meets the specification given in this data sheet. You may order **variants** by adding a suffix to the type number. You may also order **options** by adding a suffix to the type number. You may order product with **specification options** by discussing your requirements with us. If your selection option is for one-off order, then the product will be referred to as 9900A. For a repeat order, ET Enterprises will give the product a two digit suffix after the letter B, for example B21. This identifies your specific requirement.

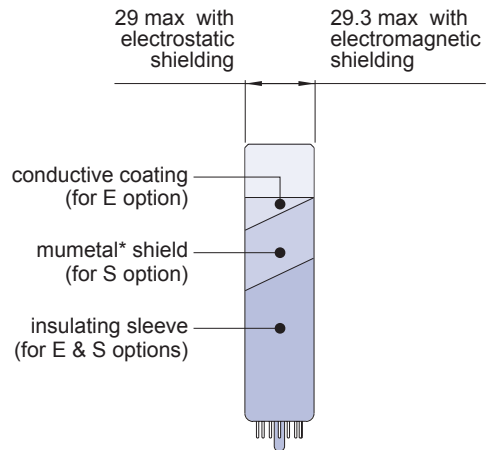
9900

### options

- E** electrostatic shielding  
see drawing below
- S** electromagnetic shielding  
see drawing below
- M** supplied with spectral  
response calibration

### specification options

- B** as given in data sheet
- A** single order to  
selected specification
- Bnn** repeat order to  
selected specification



## 12 voltage dividers

The standard voltage divider available for these pmts is tabulated below:

	k	d <sub>1</sub>	d <sub>2</sub>	.....	d <sub>7</sub>	d <sub>8</sub>	d <sub>9</sub>	d <sub>10</sub>	d <sub>11</sub>	a
C637E	2R	R	.....		R	R	R	R	R	
C637F	2R	R	.....		R	R	R	2R	R	

R = 330 kΩ

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