

51 mm (2") photomultiplier

9428B series data sheet

1 description

The 9428B is a 51mm (2") diameter, end window photomultiplier with a magnesium fluoride window, blue-green sensitive bialkali photocathode and 10 high gain, high stability, SbCs dynodes of linear focused design for good linearity and timing.

It is supplied with spectral response data at specific wavelengths in the vacuum ultra-violet and with photon counting plateau curves showing the recommended voltage for photon counting applications.

2 applications

- fluorescence studies from 110 nm to 630 nm.

3 features

- sensitive to vacuum ultra-violet
- high gain
- low operating voltage
- good SER

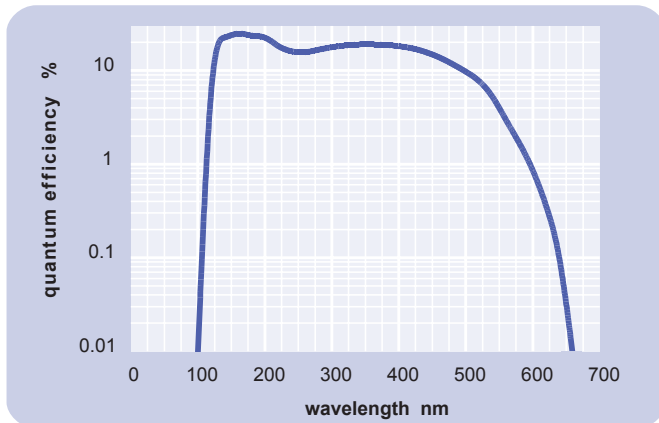
4 window characteristics

The plane of the window is cut perpendicular to its optical axis.

9428B magnesium fluoride	
spectral range (nm)*	110 - 850
refractive index (n_o)	1.38

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

5 typical spectral response curves



6 voltage divider distribution

	k	d ₁	d ₂	.....	d ₇	d ₈	d ₉	d ₁₀	a	
A	2R	R	.....	R	R	R	2R	R		Standard
B	2R	R	.....	R	2R	3R	4R	3R		High Pulsed linearity

note: Connect focus to d1

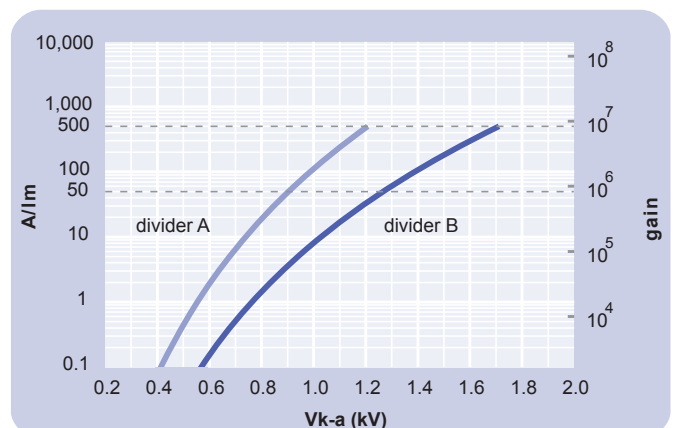
Characteristics contained in this data sheet refer to this divider unless otherwise stated.

7 characteristics

	unit	min	typ	max
photocathode: bialkali				
active diameter	mm		46	
quantum efficiency at peak	%		23	
luminous sensitivity	μA/lm		60	
with CB filter		7	10	
with CR filter			2	
dynodes: 10LFSbCs				
anode sensitivity in divider A:				
nominal anode sensitivity	A/lm		50	
max. rated anode sensitivity	A/lm		500	
overall V for nominal A/lm	V		900	1100
overall V for max. rated A/lm	V		1150	
gain at nominal A/lm	x 10 ⁶		0.8	
dark current at 20 °C:				
dc at nominal A/lm	nA		0.3	1.5
dc at max. rated A/lm	nA		3	
pulsed linearity (-5% deviation):				
divider A	mA		30	
divider B	mA		100	
rate effect (I_a for Δg/g=1%):	μA		20	
magnetic field sensitivity:				
the field for which the output decreases by 50 %				
most sensitive direction	T x 10 ⁻⁴		1.3	
temperature coefficient:	% °C ⁻¹		± 0.5	
timing:				
single electron rise time	ns		4	
single electron fwhm	ns		6.5	
transit time	ns		40	
weight:				
	g		100	
maximum ratings:				
anode current	μA			100
cathode current	nA			100
gain	x 10 ⁶			8.3
sensitivity	A/lm			500
temperature	°C	-30		60
V (k-a) ⁽¹⁾	V			2000
V (k-d1)	V			300
V (d-d) ⁽²⁾	V			300
ambient pressure (absolute)	kPa			202

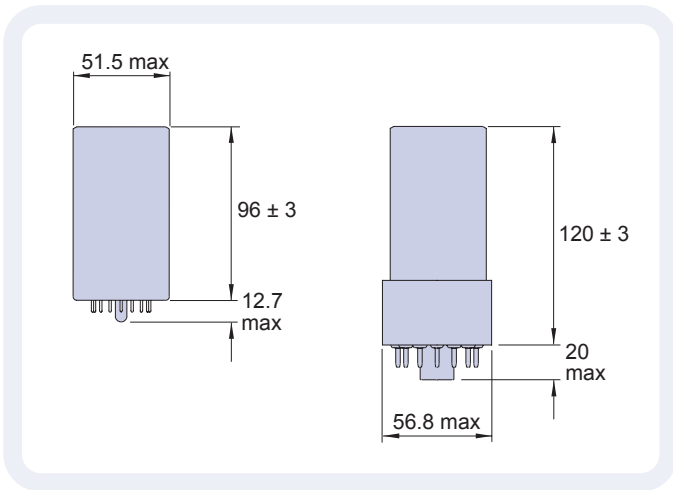
⁽¹⁾ subject to not exceeding max. rated sensitivity ⁽²⁾ subject to not exceeding max rated V(k-a)

8 typical voltage gain characteristics

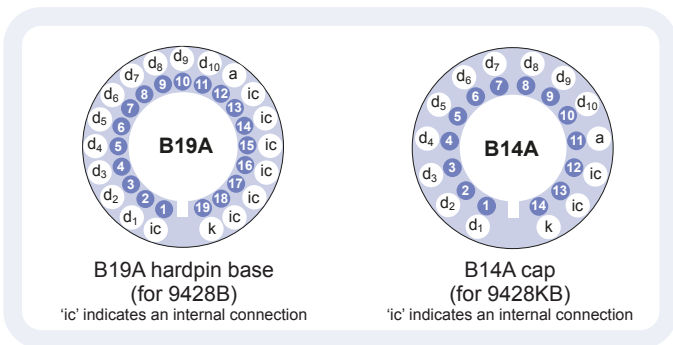


9 external dimensions mm

The drawings below show the 9428B in hardpin format and the 9428KB with the B14A cap fitted.



10 base configuration (viewed from below)



Our range of B19A sockets is available to suit the hardpin base. Our range of B14A sockets is available to suit the B14A cap. Both socket ranges include versions with or without a mounting flange, and versions with contacts for mounting directly onto printed circuit boards.

11 high voltage caution (when operating in vacuum)

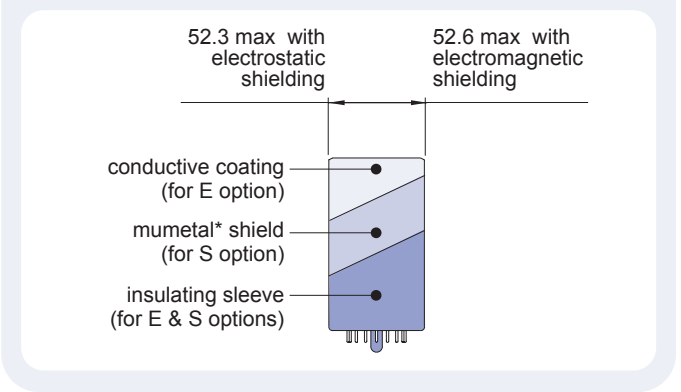
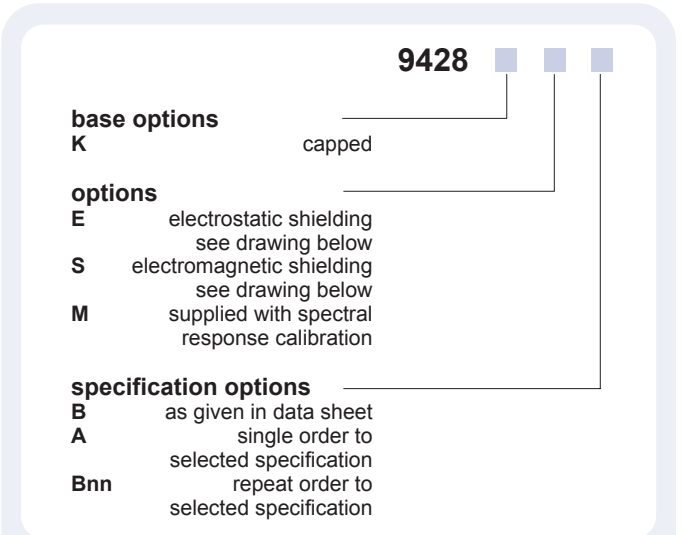
To avoid arc discharges between the photocathode and nearby grounded surfaces apply the HV only after hard vacuum has been attained, that is when the pressure is less than 10^{-3} torr. Failure to observe this precaution will destroy the pmt and invalidate the warranty.

12 handling instructions

The window of this pmt has been specially cleaned to give maximum efficiency. It should not be touched with fingers or allowed to come into contact with oil or grease. The window can be cleaned with isopropyl alcohol to remove oil deposits.

13 ordering information

The 9428B 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 9428A. 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.



14 voltage dividers

The standard voltage divider available for types with a hardpin base is tabulated below:

	k	d ₁	d ₂	.....	d ₆	d ₇	d ₈	d ₉	d ₁₀	a
C647A	2R	R	.....		R	R	R	R	R	
C647B	2R	R	.....		R	R	R	R	R	
C647C	150 V	R		R	2R	3R	4R	3R	
C647D	150 V	R		R	2R	3R	4R	3R	

note: connect focus to d1
R = 1 MΩ

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