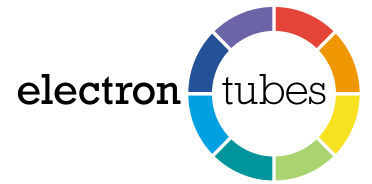


130mm (5") photomultiplier 9390B series data sheet



1 description

The 9390B is a 130mm (5") diameter, end window photomultiplier with blue-green sensitive bialkali photocathode. It has 10 high gain, high stability, SbCs dynodes of linear focused design for good linearity and timing. The 9390WB and 9390QB are variants for applications requiring UV sensitivity.

2 applications

- radiation monitoring
- scintillation spectroscopy

3 features

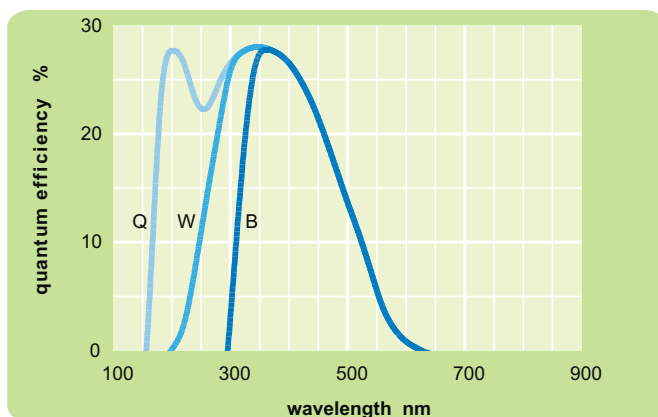
- good SER
- high pulsed linearity
- good pulse height resolution
- large active area

4 window characteristics

	9390B borosilicate	9390WB uv glass	9390QB* fused silica
spectral range**(nm)	300 - 630	205 - 630	165 - 630
refractive index (n_d)	1.49	1.48	1.46
K (ppm)	300	8500	<10
Th (ppb)	250	30	<10
U (ppb)	100	30	<10

* note that the sidewall of the envelope contains graded seals of high K content
** wavelength range over which quantum efficiency exceeds 1 % of peak

5 typical spectral response curves

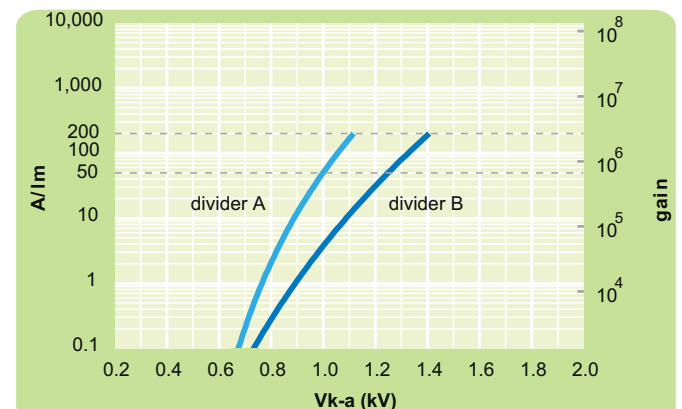


6 characteristics

	unit	min	typ	max
photocathode: bialkali				
active diameter	mm		115	
quantum efficiency at peak	%		28	
luminous sensitivity	$\mu\text{A}/\text{lm}$		75	
with CB filter		9	12	
with CR filter			2	
dynodes: 10LFSbCs				
anode sensitivity in divider A:				
nominal anode sensitivity	A/lm		50	
max. rated anode sensitivity	A/lm		200	
overall V for nominal A/lm	V		1000	1500
overall V for max. rated A/lm	V		1100	
gain at nominal A/lm	$\times 10^6$		0.7	
dark current at 20 °C:				
dc at nominal A/lm	nA		1	20
dc at max. rated A/lm	nA		4	
dark count rate	s^{-1}		1500	
pulsed linearity (-5% deviation):				
divider A	mA		30	
divider B	mA		100	
pulse height resolution:				
single electron peak to valley	ratio		2	
^{137}Cs with 5" x 5" NaI(Tl)	%		7.5	
rate effect (I_a for $\Delta g/g=1\%$):	μA		20	
magnetic field sensitivity:				
the field for which the output decreases by 50 %				
most sensitive direction	$\text{T} \times 10^{-4}$		1	
temperature coefficient:	$\% \text{ } ^\circ\text{C}^{-1}$		± 0.5	
timing:				
multi electron rise time	ns		13	
multi electron fwhm	ns		25	
single electron rise time	ns		5	
single electron fwhm	ns		8	
transit time	ns		60	
weight:	g		420	
maximum ratings:				
anode current	μA			100
cathode current	nA			500
gain	$\times 10^6$			2.7
sensitivity	A/lm			200
temperature	$^\circ\text{C}$	-30		60
V (k-a) ⁽¹⁾	V			2000
V (k-d1)	V			600
V (d-d) ⁽²⁾	V			350
ambient pressure (absolute)	kPa			202

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

7 typical voltage gain characteristics



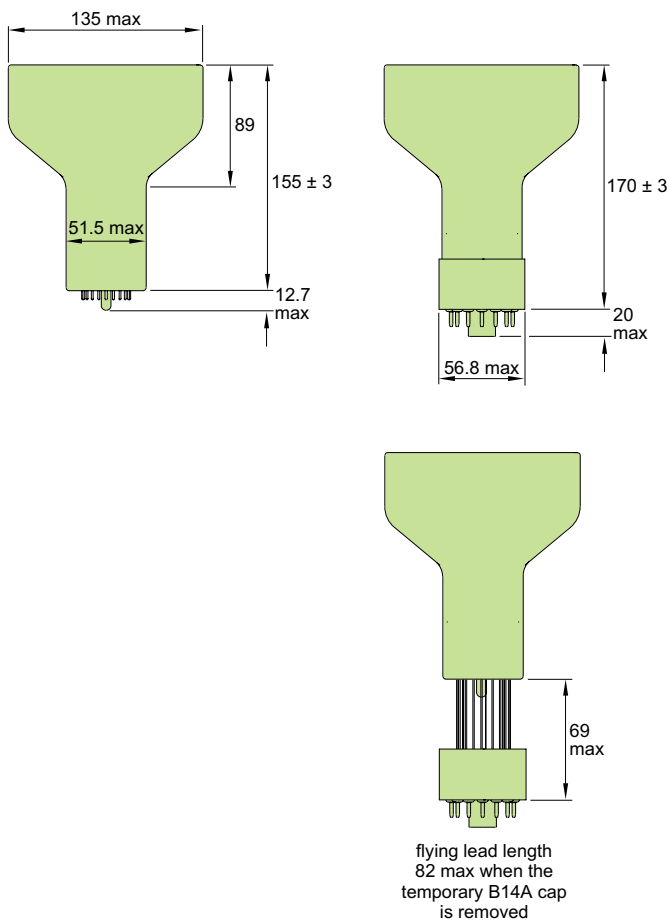
8 voltage divider distribution

	k	d ₁	d ₂	.....	d ₇	d ₈	d ₉	d ₁₀	a	
A	450V	R	.....		R	R	R	2R	R	Standard
B	450V	R	.....		R	2R	3R	4R	3R	High Pulsed linearity

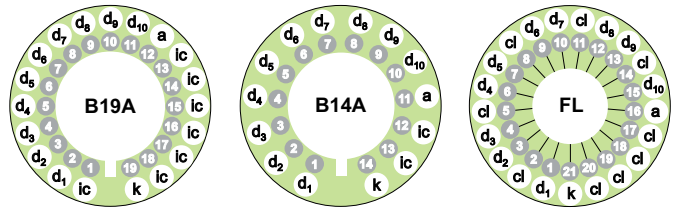
Characteristics contained in this data sheet refer to divider A unless stated otherwise.

9 external dimensions mm

The drawings below show the 9390B in hardpin format and the 9390KB with the B14A cap fitted. The 9390KFLB is shown in flying lead format with a temporary cap fitted. This temporary cap is attached as agreed with the customer.



10 base configuration (viewed from below)



B19A hardpin base (for 9390B)
'ic' indicates an internal connection

B14A cap (for 9390KB)
'ic' indicates an internal connection

flying lead base (for 9390FLB) after removal of temporary cap
'cl' indicates cut lead

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 ordering information

The 9390B 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 9390A. For a repeat order, Electron Tubes will give the product a two digit suffix after the letter B, for example B21. This identifies your specific requirement.

