

51 mm (2") photomultiplier

9816B series data sheet

1 description

The 9816B is a 51mm (2") diameter end window photomultiplier, with S20 infra-red sensitive photocathode, and 14 BeCu dynodes of linear focused design.

2 applications

- high energy physics studies
- low light level detection

3 features

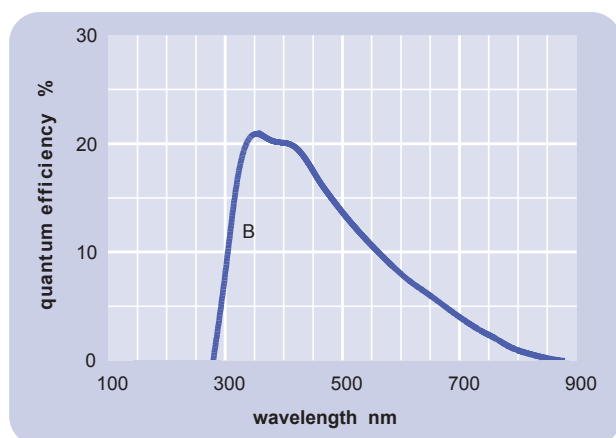
- high gain
- high pulsed linearity

4 window characteristics

9816B borosilicate	
spectral range *(nm)	290 - 870
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

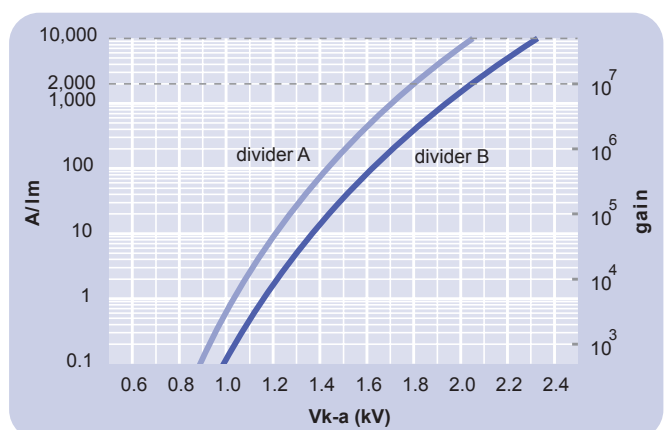


6 characteristics

	unit	min	typ	max
photocathode: S20				
active diameter	mm		46	
quantum efficiency at peak	%		21	
luminous sensitivity	$\mu\text{A}/\text{lm}$	120	200	
with CB filter			9	
with CR filter			90	
with IR filter			12	
dynodes: 14LFBcCu				
anode sensitivity in divider B:				
nominal anode sensitivity	A/lm		5000	
max. rated anode sensitivity	A/lm		10000	
overall V for nominal A/lm	V		2200	2500
overall V for max. rated A/lm	V		2300	
gain at nominal A/lm	$\times 10^6$		25	
dark current at 20 °C:				
dc at nominal A/lm	nA		50	500
dc at max. rated A/lm	nA		100	
dark count rate	s^{-1}		15000	
pulsed linearity (-5% deviation):				
divider A	mA		50	
divider B	mA		150	
rate effect (I_a for $\Delta g/g=1\%$):				
	μA		1	
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:				
single electron rise time	ns		2	
single electron fwhm	ns		3	
single electron jitter (fwhm)	ns		2.2	
transit time	ns		46	
weight:				
	g		180	
maximum ratings:				
anode current	μA			100
cathode current	nA			1000
gain	$\times 10^6$			50
sensitivity	A/lm			10000
temperature	$^\circ\text{C}$	-80		60
V (k-a) ⁽¹⁾	V			3000
V (k-d1)	V			500
V (d-d) ⁽²⁾	V			450
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

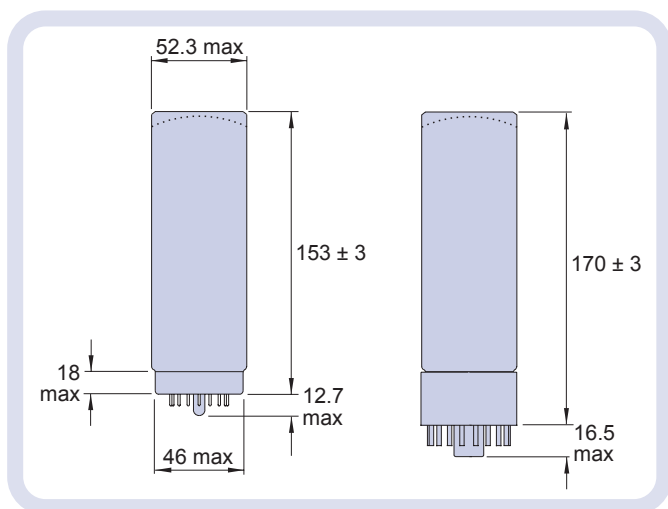
k	d ₁	d ₂	.....	d ₁₁	d ₁₂	d ₁₃	d ₁₄	a	
A	300V	R	.....	R	R	R	R	R	Standard
B	300V	R	.....	R	1.25R	1.5R	2R	3R	High Pulsed Linearity

note: focus connected to d₁

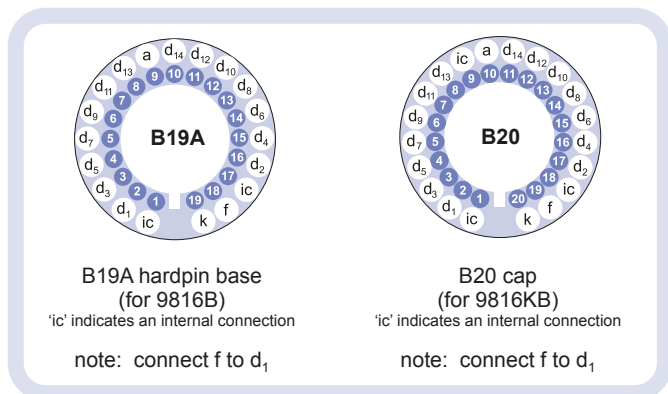
Characteristics contained in this data sheet refer to divider B unless stated otherwise.

9 external dimensions mm

The drawings below show the 9816B in hardpin format and the 9816KB with the B20 cap fitted.



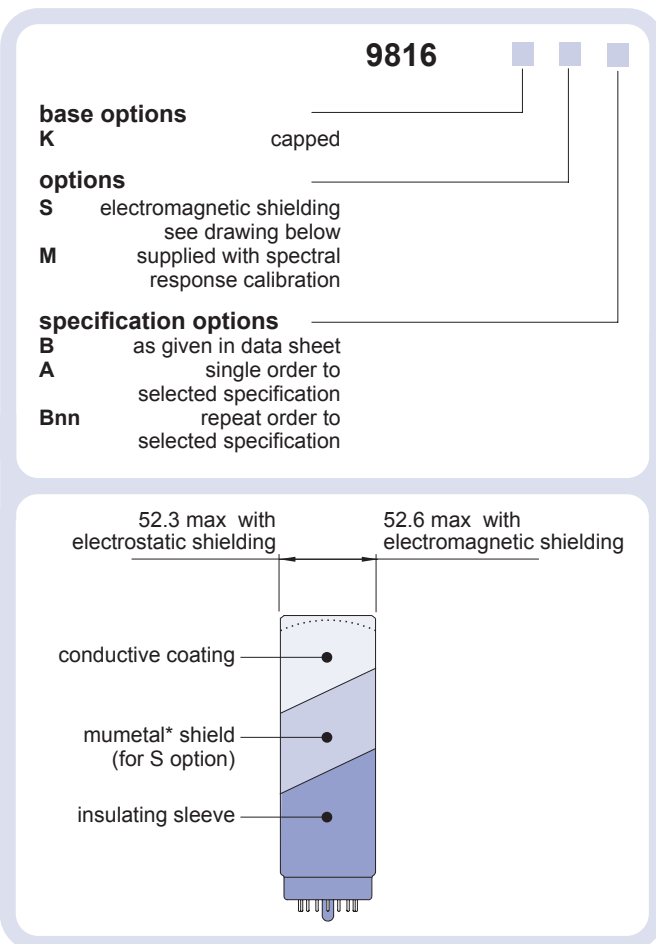
10 base configuration (viewed from below)



Our range of B19A sockets is available to suit the hardpin base. Our range of B20 sockets is available to suit the B20 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 9816B 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 a one-off order, then the product will be referred to as 9816A. For a repeat order, ET Enterprises Limited will give the product a two digit suffix after the letter B, for example B21. This identifies your specific requirement.



12 voltage dividers

The standard voltage dividers available for these pmts are tabulated below:

9816B	9816KB	k	d ₁	d ₂	.....	d ₁₀	d ₁₁	d ₁₂	d ₁₃	d ₁₄	a
C638A	C643A	3R	R	.....		R	R	R	R	R	
C638B	C643B	3R	R	.....		R	1.25R	1.5R	2R	3R	
C638C	C643C	300 V	R		R	R	R	R	R	
C638D	C643D	300 V	R		R	1.25R	1.5R	2R	3R	

R = 330 kΩ note: focus connected to d₁

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