29 mm (1.13") photomultiplier
9670B series data sheet

ET Enterprises electron tubes

1 description

The image dissector is a variant of a photomultiplier with a small active area that can be magnetically positioned (or scanned) over a large photosensitive area. Its fast response time makes it the detector of choice when rapid movements in an object imaged onto the photosensitive area are to be monitored.

The 9670B has a 0.5 mm active diameter that can be positioned (or scanned) over an 15 mm diameter photosensitive area. The photocathode is an S20 type with low resistivity suited to monitoring images projected from, or back-lit by, visible light.

Photoelectrons from the photocathode enter a drift tube which has a fixed exit aperture, and only those passing through the aperture are amplified by the internal electron multiplier. The size of the exit aperture defines the size of the active area.

When a transverse magnetic field is applied in the cathode to first dynode region, photoelectrons from a different part of the photocathode pass through the exit aperture. The active diameter can be magnetically positioned or scanned as required to monitor changes in an image projected onto the photocathode.

The electron multiplier has 9 BeCu dynodes of linear focused design for fast response time. The size of the output signal can be adjusted by varying the applied HV.

2 applications

- monitoring of movements in images projected onto the photocathode (e.g. rotation of rotor blade)
- monitoring of changes in the edge of an object projected onto the photocathode (e.g. wheel or axle wobble under rotation or stress)

3 features

- electrostatically reduced active area of 0.5 mm diameter
- active area can be magnetically positioned (or scanned) over an area of 15 mm diameter
- fast time response to step changes in light input

4 window characteristics

	9670B borosilicate
spectral range (nm)*	290 - 800
refractive index (n_d)	1.49

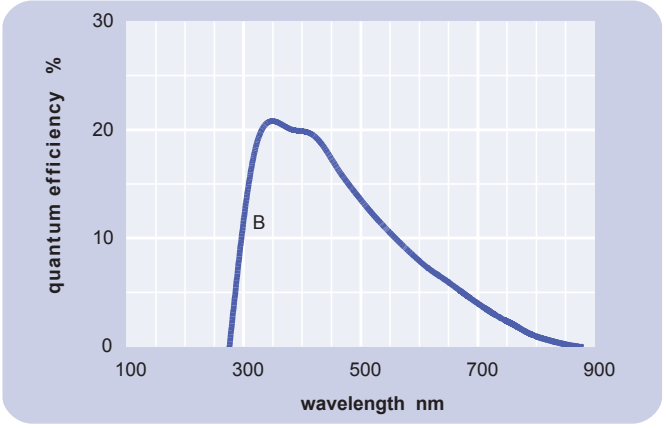
* wavelength range over which quantum efficiency exceeds 1 % of peak

5 characteristics

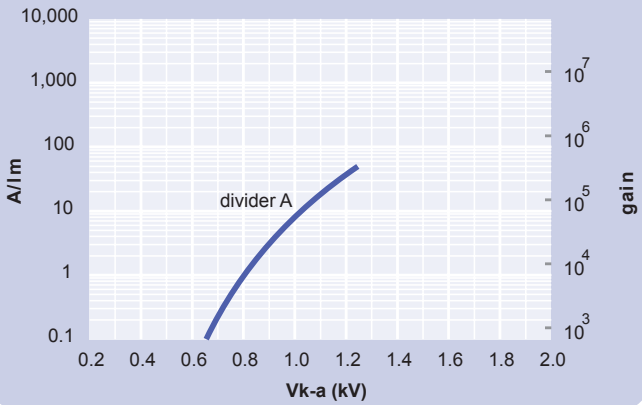
	unit	min	typ	max
photocathode: S20				
sensitive diameter	mm		15	
active diameter	mm		0.5	
quantum efficiency at peak	%		21	
luminous sensitivity	µA/lm	80	150	
with CB filter			7	
with CR filter			70	
with IR filter			7	
dynodes: 9LFBeCu				
anode sensitivity in divider A:				
at 900 V overall	A/lm	0.01	3	
dark current at 20 °C in divider A:				
at 900 V overall	nA		1	100
pulsed linearity (-5 % deviation):				
divider A	mA		50	
rate effect (I_a for $\Delta g/g=1\%$):	µA		1	
magnetic field sensitivity (transverse):				
applied field for:				
1 mm deflection active area	T x 10^{-4}		0.33	
6 mm deflection active area	T x 10^{-4}		2.0	
temperature coefficient (of anode sensitivity:	% °C^{-1}		± 0.5	
timing response to delta pulse:				
multi electron rise time	ns		5	
multi electron fwhm	ns		10	
transit time	ns		50	
weight:	g		55	
maximum ratings:				
anode current	µA			100
cathode current	nA			200
gain	x 10^6			1
sensitivity	A/lm			200
temperature	°C	-80		60
V (k-a)(1)	V			1500
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)

6 typical spectral response curves



7 typical voltage gain characteristics

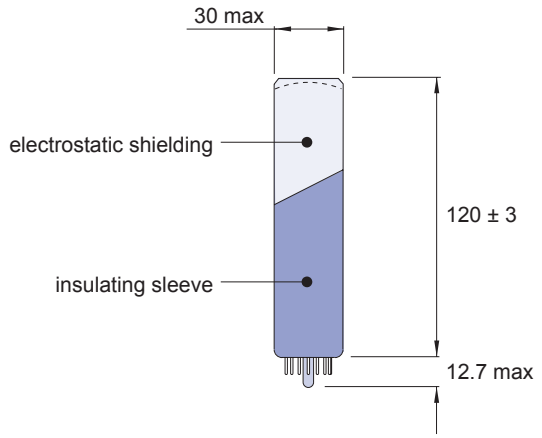


8 voltage divider distribution

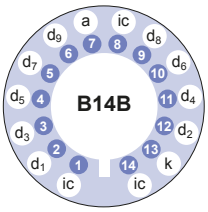
	k	d_1	d_2	.....	d_7	d_8	d_9	a	
A	300V	R	.....		R	R	R	R	Standard

Note: the k-d_1 voltage should be fixed by Zener diodes to maintain a fixed deflection in the active area with any given external magnetic field.

9 external dimensions mm



10 base configuration (viewed from below)



'ic' indicates an internal connection

Our range of B14B sockets is available to suit the B14B hardpin base. The socket range includes versions with or without a mounting flange, and versions with contacts for mounting directly onto printed circuit boards.

11 ordering information

The 9670B is the parent type. Electrostatic shielding with insulating sleeve is included as standard. The 9670B meets the specification given in this data sheet. You may order the indicated **option** by adding the 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 9670A. 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.

9670 □ □

options
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 types with a hardpin base is tabulated below:

	k	d_1	d_2	.....	d_7	d_8	d_9	a
C615G	300V	R	.....		R	R	R	R

ET Enterprises Limited
45 Riverside Way
Uxbridge UB8 2YF
United Kingdom
tel: +44 (0) 1895 200880
fax: +44 (0) 1895 270873
e-mail: sales@et-enterprises.com
web site: www.et-enterprises.com

ADIT Electron Tubes
300 Crane Street
Sweetwater TX 79556 USA
tel: (325) 235 1418
toll free: (800) 521 8382
fax: (325) 235 2872
e-mail: sales@electrontubes.com
web site: www.electrontubes.com

choose accessories for this pmt on our website

an ISO 9001 registered company