

High PHR, venetian blind, 10-stage, 76 mm (3") round tube

Applications : For gamma-cameras principally.			
Description :	Window :	Material :	lime glass
		Photocathode :	bi-alkali
		Refr. index at 420 nm :	1.54
	Multiplier :	Structure :	linear focused
		Nb of stages :	10
Mass :	190 g		

Photocathode characteristics

Spectral range :				290-650	nm
	Maximum sensitivity at :			420	nm
Sensitivity ① :					
<input checked="" type="checkbox"/>	Luminous :			100	μA/lm
	Blue :	min.: 11	typ.: 12.5		μA/lmF
	Radiant, at 420 nm :		typ.: 100		mA/W

Characteristics with voltage divider A

Gain slope (vs supp. volt., log/log) :				6.2	
For an anode blue sensitivity of :				1.5	A/lmF
<input checked="" type="checkbox"/> Supply voltage :		max.: 1400	typ.: 1250		V
		min.: 1000			
Gain :			typ.: 1.2x10 ⁵		
<input checked="" type="checkbox"/> Anode dark current ② :		max.: 20	typ.: 1		nA
<input checked="" type="checkbox"/> Pulse height resolution ⁵⁷ Co ③ :		max.: 10	typ.: 9.5		%
	Pulse height resolution ¹³⁷ Cs ③ :		typ.: 7		%
Mean anode sensitivity deviation ④ :					
	long term (16 h) :			1	%
	after change of count rate :			1	%
	vs temperature between 0 & +40°C at 420 nm :			- 0.2	%/K
Anode sensitivity change for magnetic field of 0.05 mT :				2	%
For a supply voltage of :				1500	V
	Linearity (2%) of an. current up to :			10	mA
	Anode pulse rise time ⑤ :			11	ns
	Anode pulse duration at half height :			22	ns
	Signal transit time :			54	ns
Capacitance	anode to all			8.5	pF

Recommended voltage divider

Type A for maximum gain

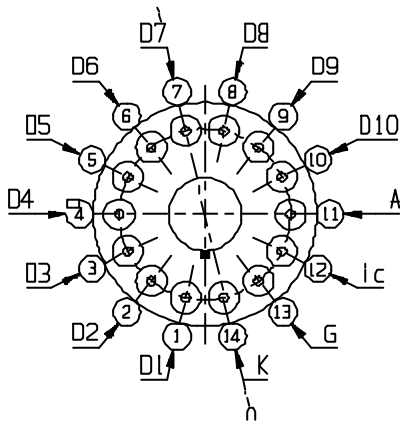
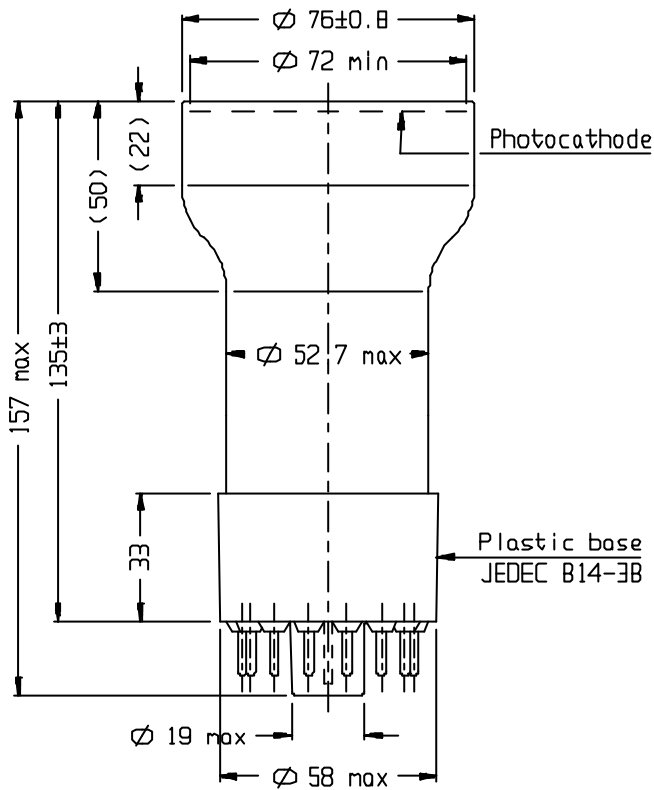
K	G	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	A	
0.5	1.5	1	1	1	1	1	1	1	1	1	1	1	(total : 12)
K: photocathode		G: focusing electrode				Dn: dynode			A: anode				

Limiting values

Anode blue sensitivity ⑥ :		max.:	15	A/lmF		
Supply voltage :		max.:	2000	V		
Continuous anode current ⑦ :		max.:	0.2	mA		
Voltage between:	G and photocathode :	max.:	500	V		
	D1 and photocathode :	min.:	150	max.:	500	V
	consecutive dynodes :			max.:	300	V
	anode and D10 ⑧ :	min.:	40	max.:	300	V
Ambient temperature:	short operation (< 30 mn) :	min.:	-30	max.:	+80	°C
	continuous operation & storage :	min.:	-30	max.:	+50	°C

Notes

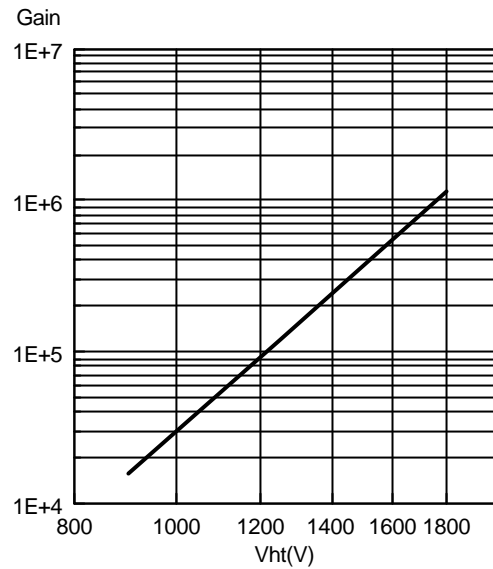
- ☑ Characteristic measured and mentioned on the test ticket of each tube.
- ① Luminous sensitivity is measured with a tungsten filament lamp with a colour temperature of 2856 ± 5 K. The blue sensitivity, expressed in A/lmF ("F" as in Filtered) is measured with a tungsten filament lamp with a colour temperature of 2856 ± 5 K. Light is transmitted through a blue filter Corning CS no.5-58, polished to half stock thickness. The radiant sensitivity is measured with a tungsten filament lamp with a colour temperature of 2856 ± 5K. Light is transmitted through an interference filter. Radiant sensitivity at 420 nm, expressed in mA/W, can be estimated by multiplying the blue sensitivity, expressed in µA/lmF, by 7.5 for this type of tube.
- ② Dark current is measured at ambient temperature, after the tube has been in darkness for approximately 1 min. Lower value can be obtained after a longer stabilisation period in darkness (approx. 30 min.).
- ③ Pulse amplitude resolution for ¹³⁷Cs and ⁵⁷Co is measured with a NaI(Tl) cylindrical scintillator with a diameter of 76 mm and a height of 76 mm. The count rate used is ~ 1.E+04 c/s.
- ④ The mean pulse amplitude deviation is measured by coupling a NaI(Tl) scintillator to the window of the tube. Long term (16h) deviation is measured by placing a ¹³⁷Cs source at a distance from the scintillator such that the count rate is ~1.E+04 c/s, corresponding to an anode current of ~ 300 nA. The mean pulse amplitude deviation after change of count rate is measured with a ¹³⁷Cs source at a distance from the scintillator such that the count rate can be changed from 1.E+04 to 1.E+03 c/s, corresponding to an anode current of ~1 µA and 0.1 µA respectively. Both tests are carried out according to ANSI-N42-9-1972 of IEEE recommendations.
- ⑤ Measured with a pulse light source, with a pulse duration (FWHM) of approximately 1 ns., the cathode being completely illuminated. The rise time is determined between 10 % and 90 % of the anode pulse amplitude. The signal transit time is measured between the instant at which the illuminating pulse of the cathode becomes maximum, and the instant at which the anode pulse reaches its maximum. Rise time, pulse duration and transit time vary with respect to high tension supply voltage Vht as (Vht)^{-1/2}.
- ⑥ The voltage corresponding to this maximum anode blue sensitivity is equal to 1.5 times the voltage indicated on the test ticket of the tube.
- ⑦ A value less than 10 µA is recommended for applications requiring good stability.
- ⑧ When calculating the anode voltage, the voltage drop across the load resistor should be taken into account.



ref.: 89200011
ic: internal connection
n: plane of symmetry of the multiplier

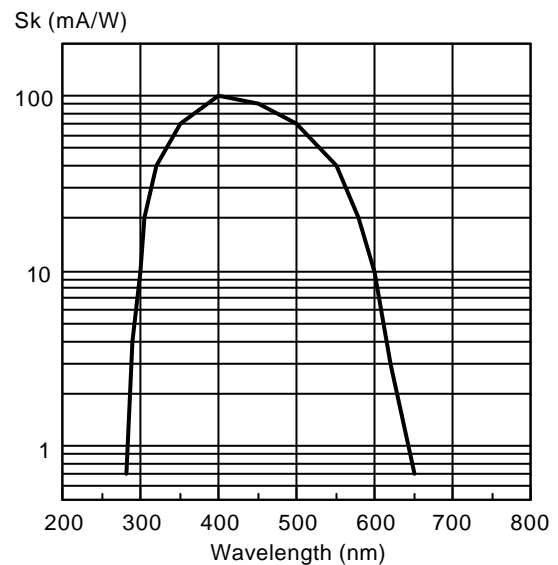
K: cathode G: focusing electrode
Dn: dynode A: anode

Typical gain curve



XP2412

Typical spectral characteristics



XP2412

Accessories

Socket : FE1014
Mu-metal shield : MS153
Voltage divider : VD202K