

**A 5" (127mm) , 10-stage, venetian blind tube**

<b>Applications :</b>	For application requiring a large detection area but no timing performances.		
<b>Description :</b>	Window :	Material :	borosilicate glass
		Photocathode :	bi-alkali
		Refr. index at 400 nm :	1.48
	Multiplier :	Structure :	venetian blind
		Nb of stages :	10
	Mass :		460 g

**Photocathode characteristics**

Spectral range :			270-650	nm
	Maximum sensitivity at :		420	nm
<input checked="" type="checkbox"/> Sensitivity ① :	Luminous :		typ.: 60	μA/lm
	Blue :	min.: 8	typ.: 11	μA/lmF
	Radiant, at 700 nm :		typ.: 85	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.: 1500	typ.: 1250	V
		min.: 1000		
Gain :			1.4x10 <sup>5</sup>	
<input checked="" type="checkbox"/> Anode dark current ② :		max.: 5	typ.: 0.5	nA
Pulse height resolution <sup>137</sup> Cs ③ :			typ.: 7	%
Mean anode sensitivity deviation ④ :				
	long term (16 h) :		1	%
	after change of count rate :		1	%
	vs temperature between			
	0 and +40 °C at 420 nm :		- 0.2	%/K
Gain halved for a magnetic field of :			0.2	mT

**Characteristics with voltage divider ⑤ :**

	<b>A2</b>	<b>A1</b>	
For a supply voltage of :	1500	1500	V
Gain :	2.6x10 <sup>5</sup>	4.2x10 <sup>5</sup>	
Linearity (2%) of anode current up to :	10	10	mA
Anode pulse ⑥ :			
	Rise time :	16	ns
	Duration at half height :	40	ns
	Transit Time :	90	ns
Capacitance	anode to all :	8.5	pF

**Recommended voltage divider**

**Type A1** 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		(total :12)

**Type A2**

K	G	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	A	
0.5	2.5	1	1	1	1	1	1	1	1	1	1		(total :13)
K: photocathode		Dn: dynode				A: anode							

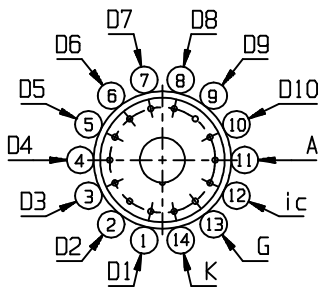
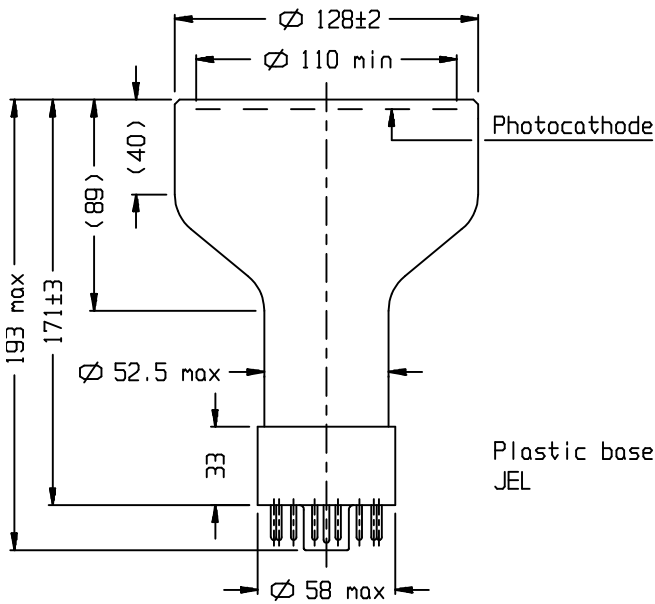
**Limiting values**

Anode luminous sensitivity :		max.:	30	A/lmF
Supply voltage :		max.:	2000	V
Continuous anode current :		max.:	0.2	mA
Voltage between :				
	G and photocathode :		max.:	500
	D1 and photocathode :	min.:	100	max.:
	consecutive dynodes :		max.:	300
	anode and D10 :	min.:	30	max.:
				300
				V
Ambient temperature :				
	short operation (< 30 mn) :	min.:	-30	max.:
	continuous operation & storage :	min.:	-30	max.:
				+80
				+50
				°C
				°C

**Notes**

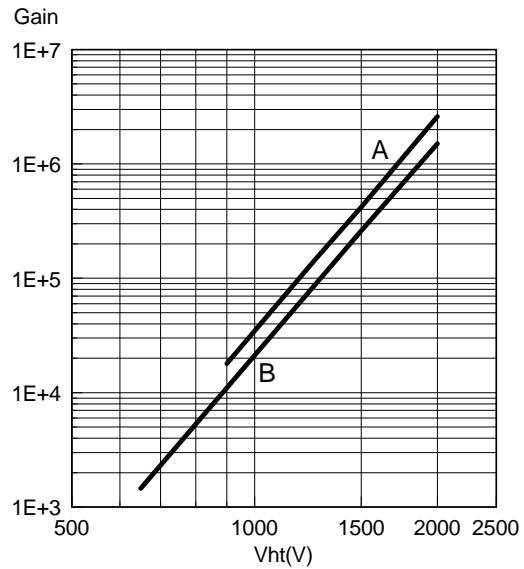
Characteristic measured and mentioned on the test ticket of each tube.

- ① Luminous sensitivity is measured with a tungsten filament lamp with a colour temperature of  $2856 \pm 5$  K. The blue sensitivity, expressed in A/lmF ("F" as in Filtered) is measured with a tungsten filament lamp with a colour temperature of  $2856 \pm 5$  K. Light is transmitted through an interference filter.
- 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  $^{137}\text{Cs}$  is measured with NaI(Tl) cylindrical scintillator with a diameter of 12 mm and a height of 25 mm. The count rate used is  $\sim 10^4$  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  $^{137}\text{Cs}$  source at a distance from the scintillator such that the count rate is  $\sim 10^4$  c/s, corresponding to an anode current of  $\sim 300$  nA. The mean pulse amplitude deviation after change of count rate is measured with a  $^{137}\text{Cs}$  source at a distance from the scintillator such that the count rate can be changed from  $10^4$  to  $10^3$  c/s, corresponding to an anode current of  $\sim 1$   $\mu\text{A}$  and  $0.1$   $\mu\text{A}$  respectively. Both tests are carried out according to ANSI-N42-9-1972 of IEEE recommendations.
- ⑤ To obtain a peak pulse current greater than that obtainable with divider A, it is necessary to increase the inter-dynode voltage progressively. Other dividers can be conceived to achieve other compromises. It is generally recommended that the voltage ratio between two successive stages is less than 2.
- ⑥ 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  $V_{ht}$  as  $(V_{ht})^{-1/2}$ .



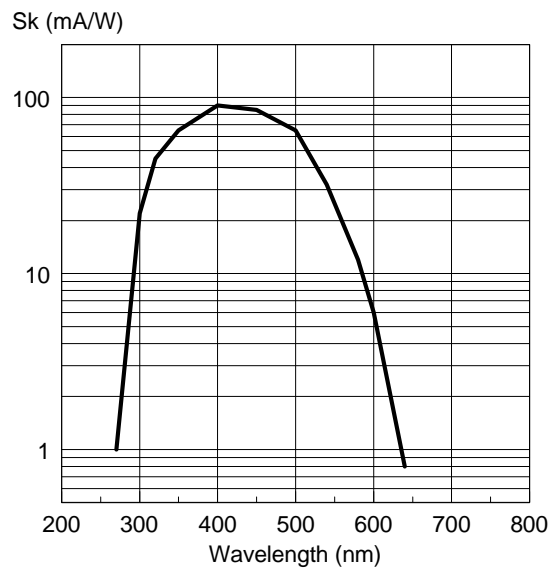
ref. 72500004  
ic: internal connection  
n: plane of symmetry of the multiplier  
  
K: cathode      Dn: dynode  
A: anode

Typical gain curve



XP2050

Typical spectral characteristics



XP2050

Accessories

Socket : FE2019  
Mu-metal shield: MS153