

A fast, 6-stage, 51mm (2") tube

Applications :	For high and medium energy physics experiments, for very good pulse linearity and time characteristics of high amplitude pulses at high count rates.		
Description :	Window :	Material :	lime glass
		Photocathode :	bi-alkali
		Refr. index at 420 nm :	1.54
	Multiplier :	Structure :	linear focused
		Nb of stages :	6
	Mass :		151 g

Photocathode characteristics

Spectral range :			290-650	nm
	Maximum sensitivity at :		420	nm
Sensitivity ① :				
<input checked="" type="checkbox"/>	Luminous :		typ.: 90	μA/lm
	Blue :	min.: 8	typ.: 10.5	μA/lmF
	Radiant, at 420 nm :		typ.: 80	mA/W

Characteristics with voltage divider A

Gain slope (vs supp. volt., log/log) :			4	
For a gain of :			10 ⁴	
<input checked="" type="checkbox"/>	Supply voltage :	max.: 1400	typ.: 1100	V
		min.: 800		
<input checked="" type="checkbox"/>	Anode dark current ② :	max.: 5	typ.: 1	nA
Mean anode sensitivity deviation ③ :				
	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 :				
	perpendicular to axis "n" :		0.2	mT
	parallel to axis "n" :		0.1	mT

Characteristics with voltage divider ④ :

	B	A	
For a supply voltage of :	1700	1600	V
Gain :	2x10 ⁴	4.5x10 ⁴	
Linearity (2%) of anode current up to :	350	100	mA
Anode pulse ⑤ :			
	Rise time :	1.6	ns
	Duration at half height :	2.4	ns
	Transit Time :	16.5	ns
	Transit Time Difference between centre of PK and 18mm from it :	0.7	ns
Capacitance	anode to all dynodes :	5	pF

product specification

Recommended voltage divider

Type A for maximum gain

K	D1	D2	D3	D4	D5	D6	A	
3	1	1	1	1	1	1	1	(total :9)

Type B for best timing / linearity compromise

K	D1	D2	D3	D4	D5	D6	A	
3	1	1.5	2.25	1.75	2.75	2.5		(total :14.75)

K: photocathode Dn: dynode A: anode

Limiting values

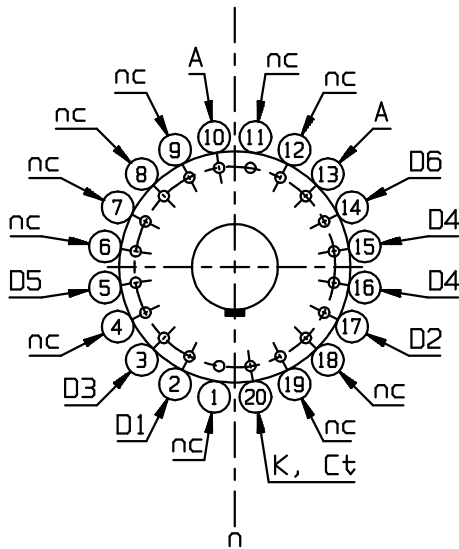
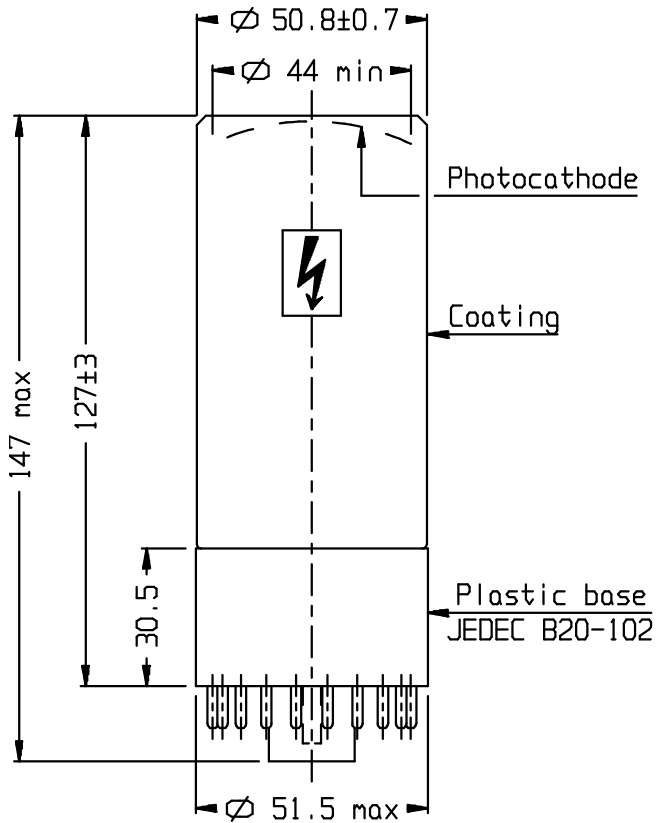
Gain :				max.:	2x10 ⁵	
Supply voltage :				max.:	2200	V
Continuous anode current :				max.:	0.2	mA
Voltage between :						
	D1 and photocathode :	min.:	200	max.:	800	V
	consecutive dynodes :			max.:	400	V
	anode and D6 :	min.:	80	max.:	600	V
Ambient temperature :						
	short operation (< 30 mn) :	min.:	-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 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 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 ~ 10⁴ 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 10⁴ to 10³ 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.
- ④ To obtain a peak pulse current greater than that obtainable with divider A, it is necessary to increase the inter-dynode voltage progressively. Divider circuit C is an example of a progressive divider, giving a compromise between gain, speed and linearity. 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.
- 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}.

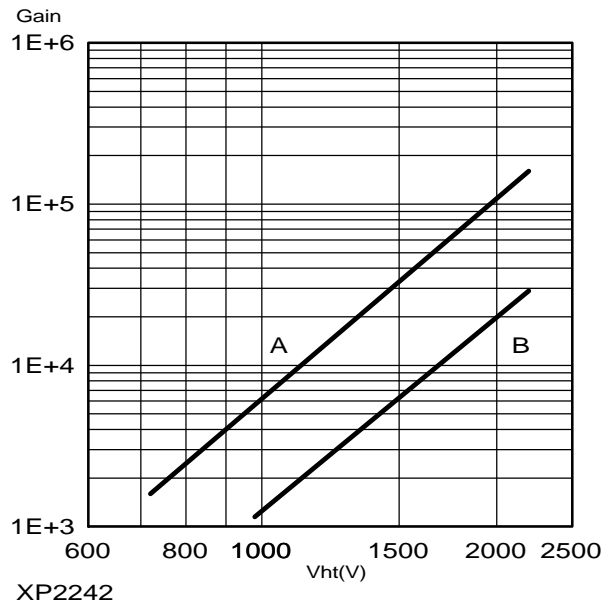
Note : The envelope of the tube is covered with a conductive coating connected to the photocathode on top of which a black paint is applied. This paint is neither guaranteed to be light-tight nor electrically insulating. Care should be taken to avoid electrical shock.



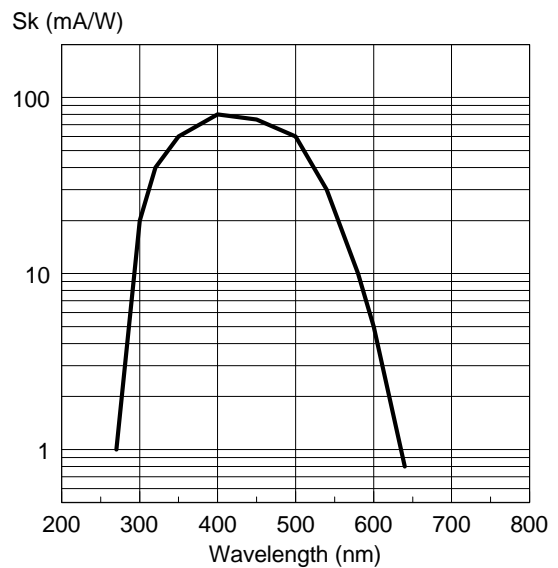
ref.: 87400007
 nc: not connected
 n: plane of symmetry of the multiplier

 K: cathode Dn: dynode
 A: anode

Typical gain curve



Typical spectral characteristics



Accessories

Socket : FE1120
 Mu-metal shield: MS152
 Voltage divider: VD162K/B