

**A standard fast, 12-stage, 51mm (2") tube**

<b>Applications :</b>	High and medium energy physics.		
<b>Description :</b>	Window :	Material :	lime glass
		Photocathode :	bi-alkali
		Refr. index at 420 nm :	1.54
	Multiplier :	Structure :	linear focused
		Nb of stages :	12
	Mass :	130 g	

**Photocathode characteristics**

Spectral range :		290-650	nm
	Maximum sensitivity at :	420	nm
Sensitivity ① :			
<input checked="" type="checkbox"/>	Luminous :	typ.: 70	μA/lm
	Blue :	min.: 9	typ.: 11.2
	Radiant, at 400 nm :	typ.: 90	μA/lmF mA/W

**Characteristics with voltage divider A**

Gain slope (vs supp. volt., log/log) :		9	
For a gain of :		3x10 <sup>7</sup>	
<input checked="" type="checkbox"/>	Supply voltage :	max.: 2400	typ.: 1800
		min.: 1500	V
<input checked="" type="checkbox"/>	Anode dark current ② :		typ.: 10
<input checked="" type="checkbox"/>	Background noise ③ :	max.: 6000	typ.: 1000
	Single electron spectrum ④ resolution :		typ.: 70
	peak to valley ratio :		typ.: 3
	Mean anode sensitivity deviation :		
	long term (16 h) :		typ.: 1
	after change of count rate :		typ.: 1
	vs temperature between 0 and +40°C at 400 nm :		typ.: -0.2
	Gain halved for a magnetic field of :		
	perpendicular to axis "n" :		0.2
	parallel to axis "n" :		0.1

**Characteristics with voltage divider ⑤ :**

	<b>B</b>	<b>A</b>	
For a supply voltage of :	2300	1900	V
Gain :	6x10 <sup>7</sup>	5x10 <sup>7</sup>	
Linearity (2%) of anode current up to :	250	100	mA
Anode pulse ⑥ :			
	Rise time :	2	2.3
	Duration at half height :	3	3.7
	Transit Time :	30	31
	Transit Time Difference between centre of PK and 18mm from it :		0.7
Capacitance	anode to all dynodes :		5

product specification

Recommended voltage divider

Type A for maximum gain

K	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	A	
4	1.1	0.9	1	1	1	1	1	1	1	1	1	1	1	(total : 16)

Type B for best timing / linearity compromise

K	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	A	
4	1.1	0.9	1	1	1	1.25	1.25	1.5	2.25	1.75	2.75	2.5	1	(total : 22.25)

K: photocathode      Dn: dynode      A: anode

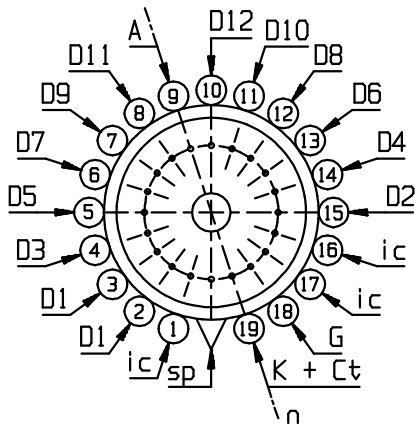
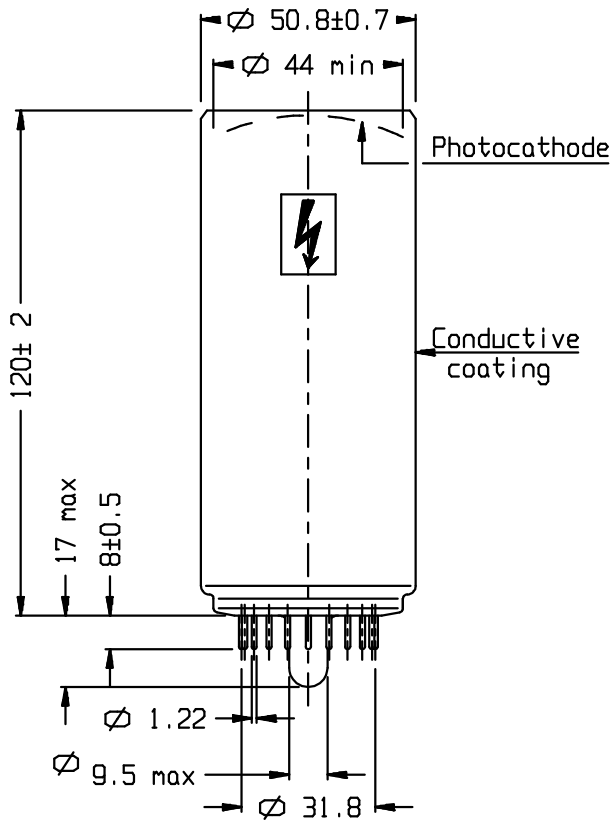
Limiting values

Anode luminous sensitivity :			max.:	2x10 <sup>8</sup>	
Supply voltage :			max.:	2500	V
Continuous anode current :			max.:	0.2	mA
Voltage between :					
	D1 and photocathode :	min.:	300	max.:	800 V
	consecutive dynodes :			max.:	400 V
	anode and D12 :	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 radiant blue sensitivity expressed in A/lmF ("F" as filtered) is measured with a tungsten filament lamp with a colour of 2856 ± 5 K transmitted through a blue filter Corning Cs N°5-58, polished to half stock thickness.
- ② Dark current is measured at ambient temperature, after the tube has been in darkness for approximately 1 min. A lower value can be obtained after a longer stabilisation period in darkness (approx. 30 min.).
- ③ Noise is measured at ambient temperature. After having been stored with its protection hood, the tube is placed in darkness with Vd set at a value to give a gain of 3 10<sup>7</sup>. After a 30mn stabilisation period, noise pulses above a threshold of 1 pC (corresponding to 0.2 photoelectron) are recorded.
- ④ The peak to valley ratio is defined as the single electron peak value divided by the minimum value to the left of the peak.
- ⑤ 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 B is an example of a progressive divider, giving an optimisation of 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.
- ⑥ Measured with a pulse light source, with a pulse duration (FWHM) of approximately 1ns., 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)<sup>-1/2</sup>. Transit Time Difference between centre and edge (18mm from PK centre) is 0.25 ns at 2500 V with C divider.

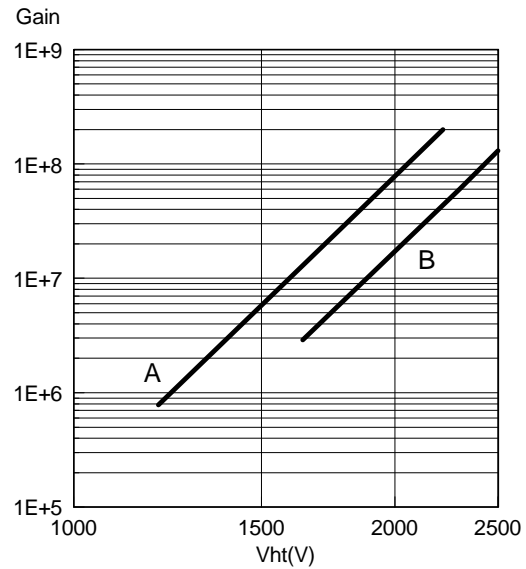
**Note : The envelope of the tube is covered with a conductive coating connected to the photocathode on top of which a black paint is applied. This paint is neither guaranteed to be light-tight nor electrically insulating. Care should be taken to avoid electrical shock.**



ref. 90500012

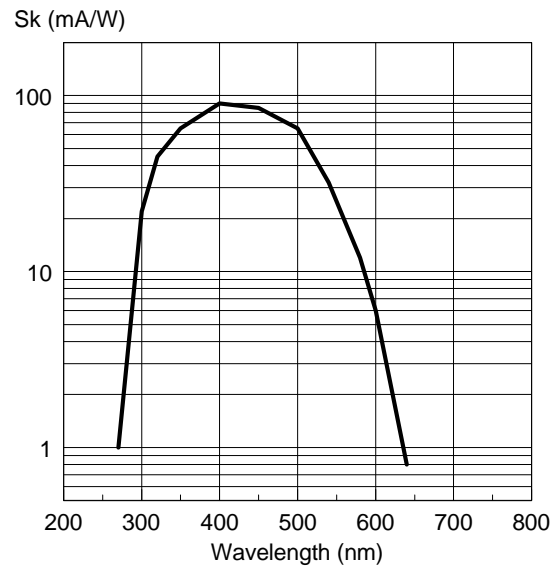
- sp: short pin
- ic: internal connection
- n: plane of symmetry of the multiplier
- K: cathode                      Dn: dynode
- A: anode

Typical gain curve



XP2262

Typical spectral characteristics



XP2262

**Accessories**

- Socket : FE2019
- Mu-metal shield : MS172