Fast, 8-stage, 76 mm (3") round tube

Applications :	This tube features a good compromise between pulse amplitude resolution and time characteristics for scintillation detection application.		
Description :	Window :	Material :	lime glass
		Photocathode :	bi-alkali
		Refr. index at 420 nm :	1.54
	Multiplier :	Structure :	linear focused
		Nb of stages :	8
	Mass :	200 g	

Photocathode characteristics

	Spectral range :				290-650	nm
		Maximum sensitivity at :			420	nm
	Sensitivity ① :	Luminous :		typ.:	100	µA/lm
☑		Blue :	min.: 9	typ.:	12	µA/lmF
		Radiant, at 420 nm :		typ.:	96	mA/W

Characteristics with voltage divider A

	Gain slope (vs supp. volt., log/log) :				5.5	
	For a gain of :				10^6	
☑	Supply voltage :		max.: 1600	typ.:	1350	V
			min.: 1150			
☑	Anode dark current ② :		max.: 20	typ.:	2	nA
☑	Background noise ③ :		max.: 10000	typ.:	5000	c/s
	Mean anode sensitivity deviation :					
		long term (16h) :			1	%
		after change of count rate :			1	%
		vs temperature between 0°C and +40°C at 400 nm			-0.2	%/K
	Single electron spectrum ④ :					
		resolution :		typ.:	60	%
		peak to valley ratio :		typ.:	2	
	Gain halved for a magnetic field of :					
		perpendicular to axis "n" :			0.2	mT
		parallel with axis "n" :			0.1	mT

Characteristics with voltage divider ⑤ :

		B	A	
For a supply voltage of :		1600	1350	V
Gain :		10^6	10^6	
Linearity (2%) of anode current up to :		200	50	mA
Anode pulse ⑥ :	Rise time :	3		ns
	Duration at half height :	4		ns
	Transit Time :	40		ns
	Transit Time Difference centre of PK to 18mm from it :	0.5	0.7	ns
Capacitance	anode to all dynodes :		5	pF

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product specification

Recommended voltage divider

Type A for maximum gain

K	G1	G2	D1	D2	D3	D4	D5	D6	D7	D8	A	
0.12	0.7	2.3	1.5	1	1	1	1	1	1	1		(total :11.62)

Type B for best timing / linearity compromise

K	G1	G2	D1	D2	D3	D4	D5	D6	D7	D8	A	
0.12	0.7	2.3	1.5	1.25	1.25	1.5	1.75	2	2.75	2.75		(total :17.87)

K: photocathode G1, G2: focusing electrodes Dn: dynode A: anode

Limiting values

Gain:				max.:	$3x10^6$	
Supply voltage :				max.:	2000	V
Continuous anode current :				max.:	0.2	mA
Voltage between:						
	G1 and photocathode :			max.:	20	V
	D1 and photocathode :	min.:	250	max.:	700	V
	consecutive dynodes :			max.:	400	V
	anode and D8 :	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 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 Noise is measured at ambient temperature, after the tube has been stored with its protection hood, the tube is placed in darkness with Vd set at a value to give a gain of $3x10^7$. After a 30 mn stabilisation period, noise pulses with a threshold of 1 pC (corresponding to 0.2 PE) are recorded.

④ The peak to valley ratio is defined as the single electron peak value divided by the minimum value at 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 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.

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 Vht as (Vht)-½.

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.

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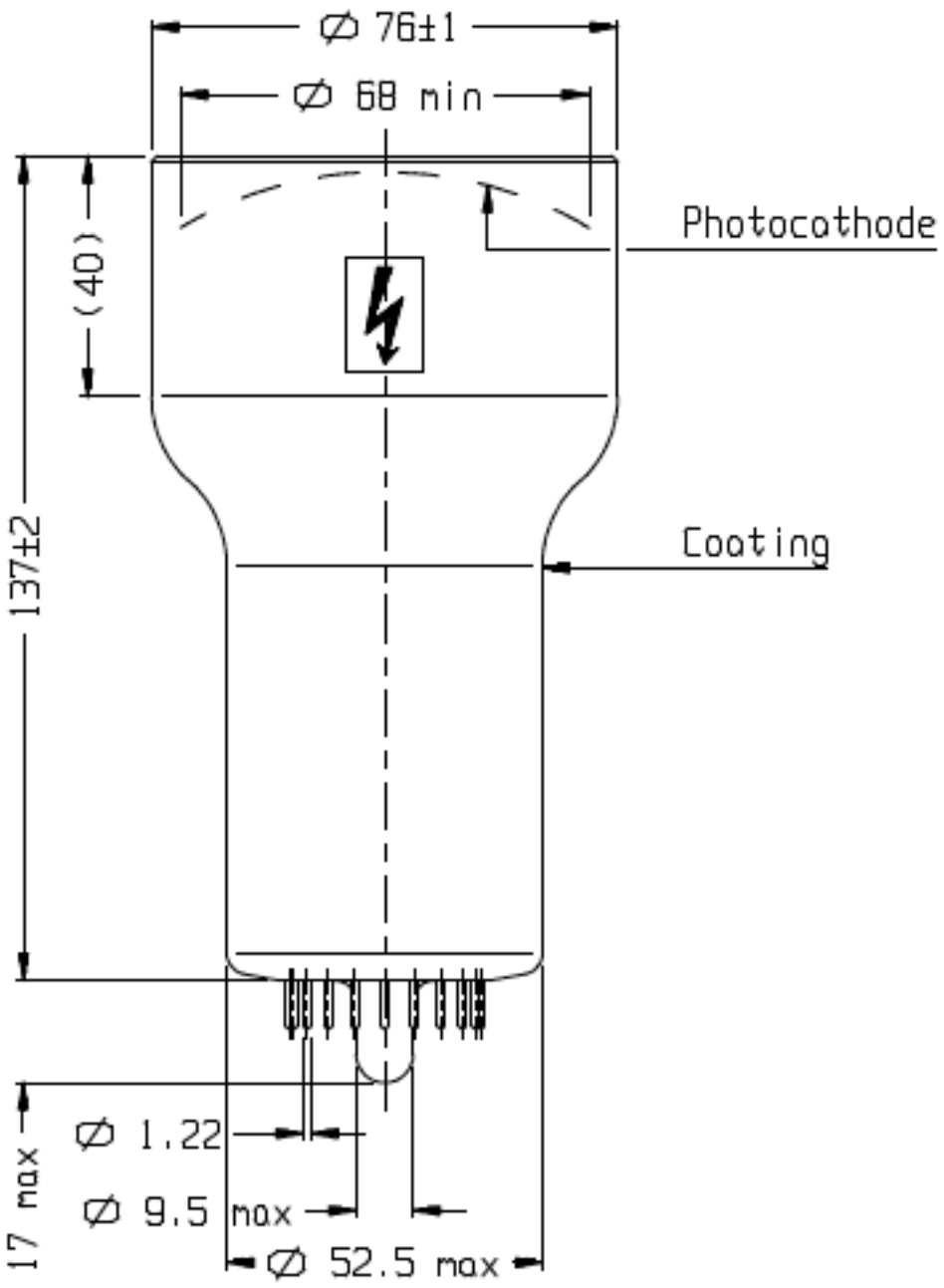
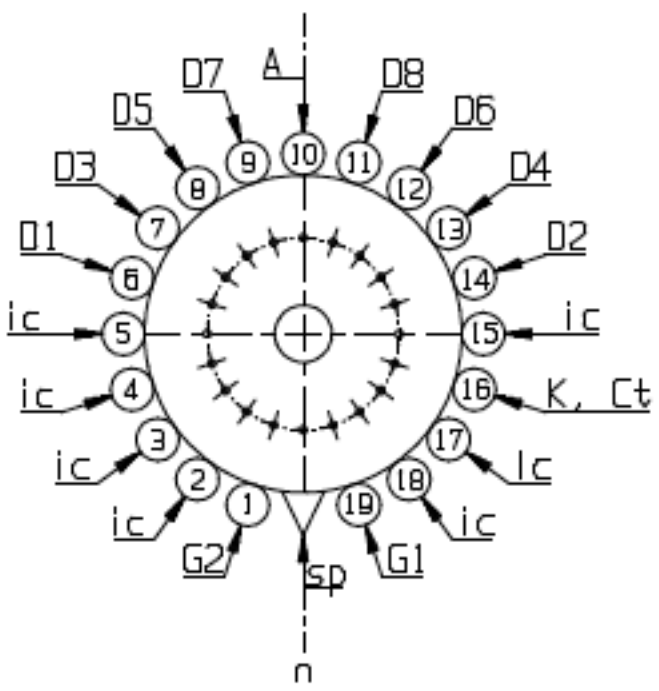
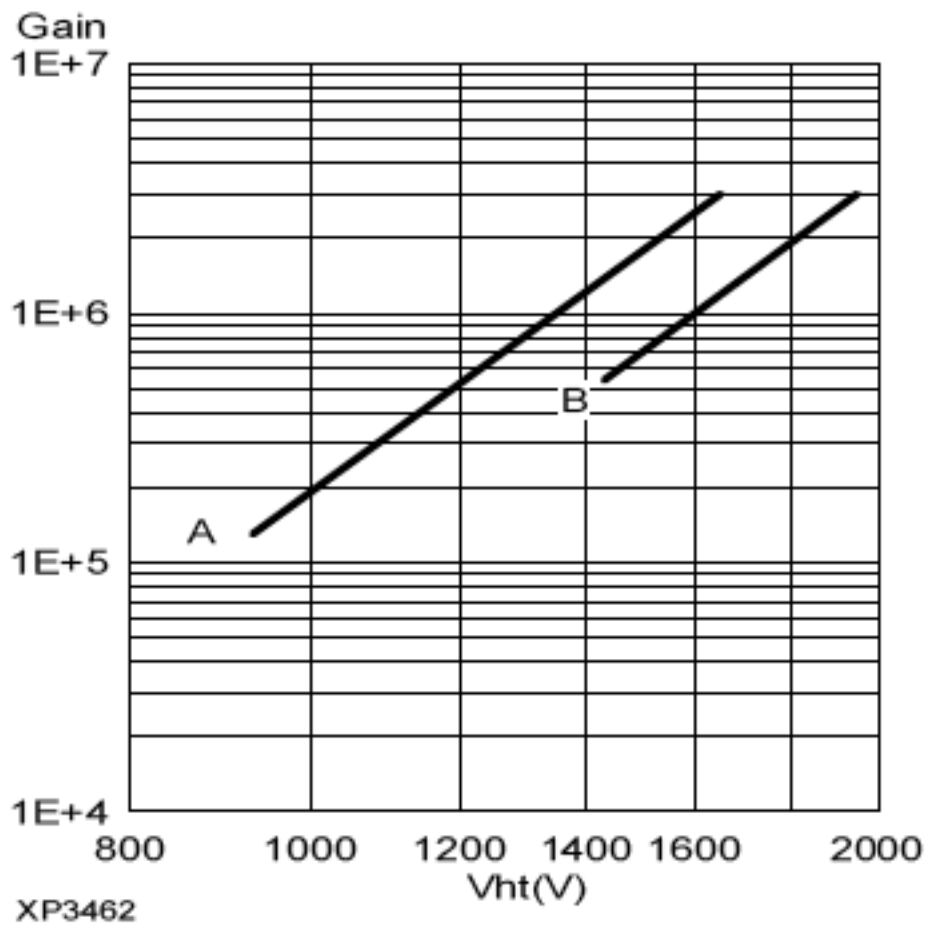




ref.: 07200008
sp: short pin
ic: internal connection
n: plane of symmetry of the multiplier

K: cathode Dn: dynode
G1, G2: focusing electrodes
A: anode Ct: coating

Typical gain curve



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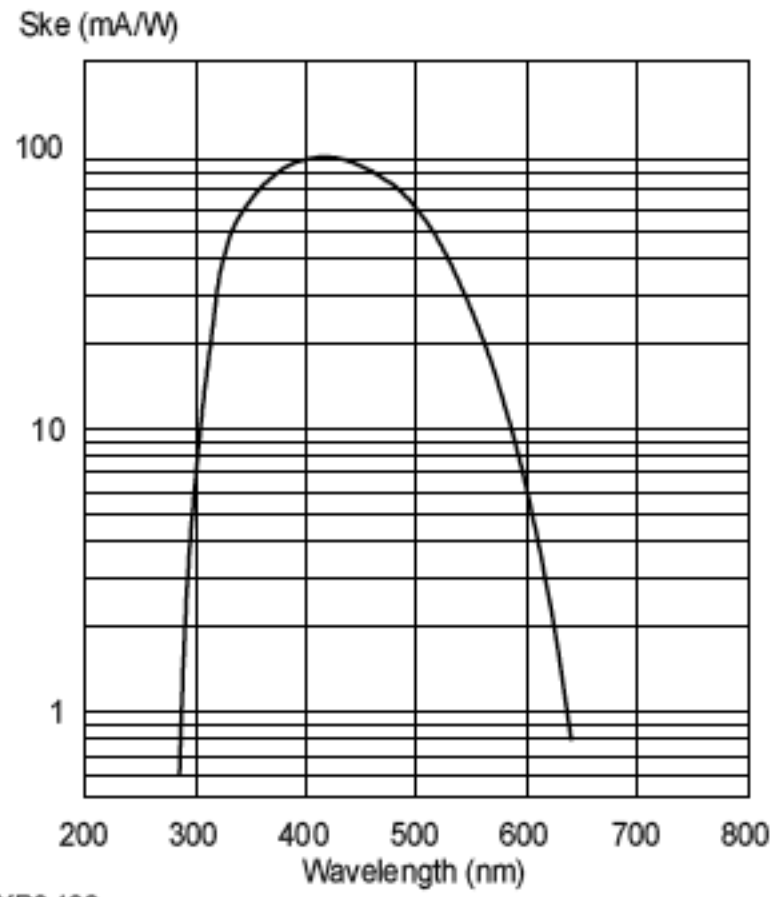
Typical spectral characteristics



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Accessories

Socket: FE2019
Mu-metal shield: MS153

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