

Standard, 10-stage, 19mm (3/4") round tube

Applications :	For high energy physics and scintillation counting under limited dimensional conditions.		
Description :	Window :	Material :	borosilicate glass
		Photocathode :	bi-alkali
		Refr. index at 420 nm :	1.48
	Multiplier :	Structure :	linear focused
		Nb of stages :	10
	Mass :	25 g	

Photocathode characteristics

Spectral range :				270-650	nm
	Maximum sensitivity at :			420	nm
Sensitivity ① :	Luminous :			100	μA/lm
<input checked="" type="checkbox"/>	Blue :	min.: 9	typ.: 11	11	μA/lmF
	Radiant, at 420 nm :		typ.: 85	85	mA/W

Characteristics with voltage divider A

Gain slope (vs supp. volt., log/log) :				6.8	
For an anode blue sensitivity of :				10	A/lmF
<input checked="" type="checkbox"/> Supply voltage :		max.: 1280	typ.: 1100	1100	V
		min.: 920			
Gain :				9x10 ⁵	
<input checked="" type="checkbox"/> Anode dark current ② :		max.: 20	typ.: 5	5	nA
Mean anode sensitivity deviation ③ :					
	long term (16 h) :			1	%
	after change of count rate :			1	%
Pulse amplitude resolution for ²² Na (511 keV) ④ :				16	%
Gain halved for a magnetic field of					
	perpendicular to axis "n" :			0.3	mT
	parallel to axis "n" :			0.2	mT

Characteristics with voltage divider A

A

For a supply voltage of :				1500	V
Gain :				7.5x10 ⁶	
Linearity (2%) of anode current up to :				20	mA
Anode pulse ⑤ :					
	Rise time :			2.3	ns
	Duration at half height :			3.5	ns
	Transit Time :			20.5	ns
	Transit Time Difference centre of photocathode up to 7 mm from it :			1.5	ns
Capacitance	anode to all :			4	pF

Recommended voltage divider

Type A for maximum gain

K	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	A	
2	1	1.5	1	1	1	1	1	1	1	1	1	(total :12.5)

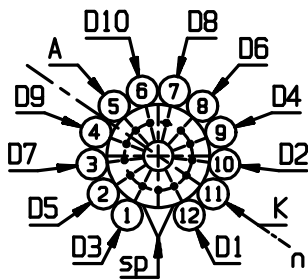
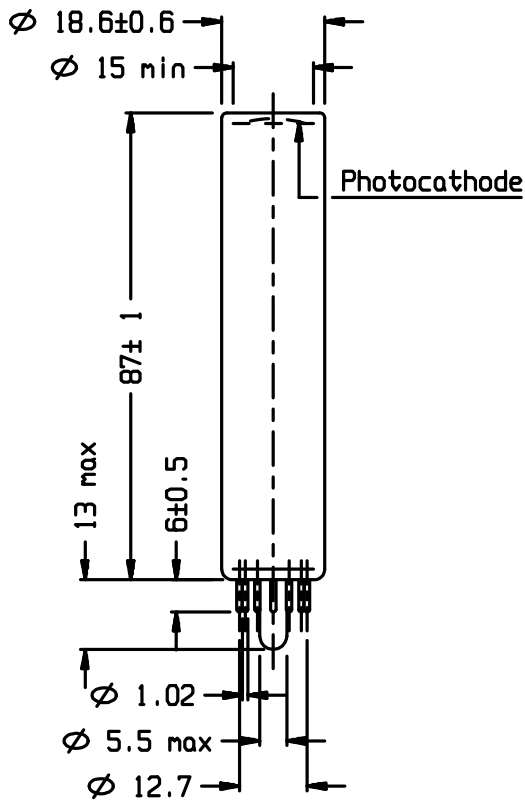
K: photocathode Dn: dynode A: anode

Limiting values

Anode luminous sensitivity :		max.:	100	A/lmF		
Supply voltage :		max.:	1700	V		
Continuous anode current :		max.:	0.2	mA		
Voltage between :						
	D1 and photocathode :	min.:	100	max.:	350	V
	consecutive dynodes :			max.:	250	V
	anode and D10 :	min.:	30	max.:	300	V
Ambient temperature :						
	short operation (< 30 mn) :	min.:	-30	max.:	+80	°C
	continuous operation & storage :	min.:	-30	max.:	+50	°C

Notes

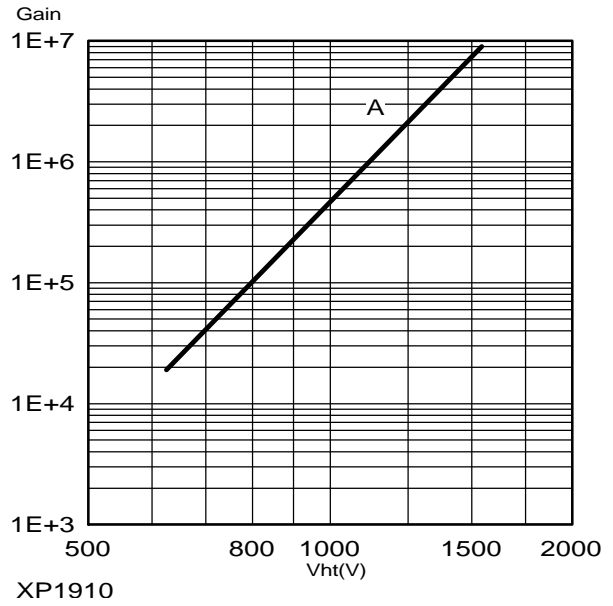
- Characteristic measured and mentioned on the test ticket of each tube.
- ① Luminous sensitivity is measured with a tungsten filament lamp with a colour temperature of 2856 ± 5 K. The blue sensitivity, expressed in A/lmF ("F" as in Filtered) is measured with a tungsten filament lamp with a colour temperature 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 ± 5 K. 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 μ A/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 ^{22}Na (511 keV) is measured with a BGO square (19 mm x 19 mm) scintillator with a height of 30 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}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 ~ 300 nA. The mean pulse amplitude deviation after change of count rate is measured with a ^{137}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 ~ 1 μ A and 0.1 μ A 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 $(Vht)^{-1/2}$.



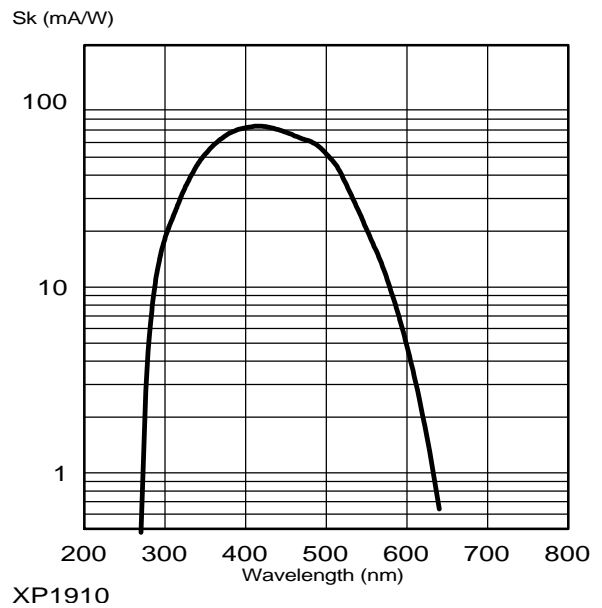
ref.: 99901519
sp: short pin
n: plane of symmetry of the multiplier

K: cathode
Dn: dynode
A: anode

Typical gain curve



Typical spectral characteristics



Accessories

- Socket: FE1004
- Socket for PCB: FE3112
- Mu-metal shield: MS178
- Voltage divider assembly:
 - + HV: VD308
 - HV: VD108