

Fast, high PHR, 10-stage, 130 mm (5") round tube

Applications :	For high energy physics where the number of photons to be detected is very low e.g. coincidence measurements and Cerenkov light detection.		
Description :	Window :	Material :	borosilicate glass
		Photocathode :	bi-alkali
		Refr. index at 420 nm :	1.48
	Multiplier :	Structure :	linear focused
		Nb of stages :	10
	Mass :		620 g

Photocathode characteristics

Spectral range :				290-650	nm
	Maximum sensitivity at :			420	nm
<input checked="" type="checkbox"/> Sensitivity ① :	Luminous :			70	μA/lm
	Blue :	min.: 8	typ.: 10		μA/lmF
	Radiant, at 420 nm :		typ.: 80		mA/W
	Quantum efficiency at 420 nm :			24	%

Output characteristics

Gain slope (vs supp. volt., log/log) :				7	
<input checked="" type="checkbox"/> For a gain of :				2x10 ⁷	
<input checked="" type="checkbox"/> Supply voltage :	max.: 2600	typ.: 2100			V
	min.: 1450				
<input checked="" type="checkbox"/> Anode dark current ② :	max.: 400	typ.: 90			nA
Mean anode sensitivity deviation :					
	long term (16 h) :			1	%
	after change of count rate :			4	%
	vs temperature between 0°C and +40°C at 400 nm :			-0.3	%/K
Gain halved for a magnetic field of ④ :					
	perpendicular to axis "n" :			0.04	mT
	parallel with axis "n" :			0.07	mT
	parallel with the tube axis :			0.13	mT
For a supply voltage of 1700 V (typical gain is 5.0 10 ⁶) :					
Linearity (2%) of anode current up to :				80	mA
<input checked="" type="checkbox"/> Anode pulse ⑤ :	Rise time :			4.3	ns
	Duration at half height :			5.5	ns
	Transit Time :			48	ns
Capacitance	anode to all :			7	pF

Recommended voltage divider

Type C for timing/ linearity / gain compromise

K	G1	D1	D2	D3	D4	D5	D6/G2	D7	D8	D9	D10	A	
3	7	2	1	1	1	1	1.5	2	2.5	3	2.5	(total : 27.5)	

K: photocathode
 Dn: dynode

G1: focusing electrode

G2: to be externally connected to D6
 A: anode

Limiting values

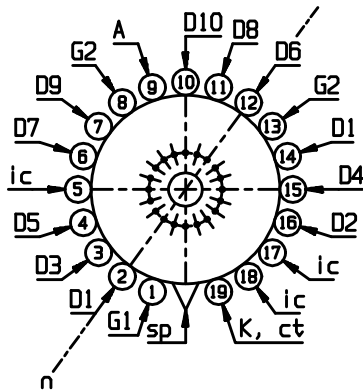
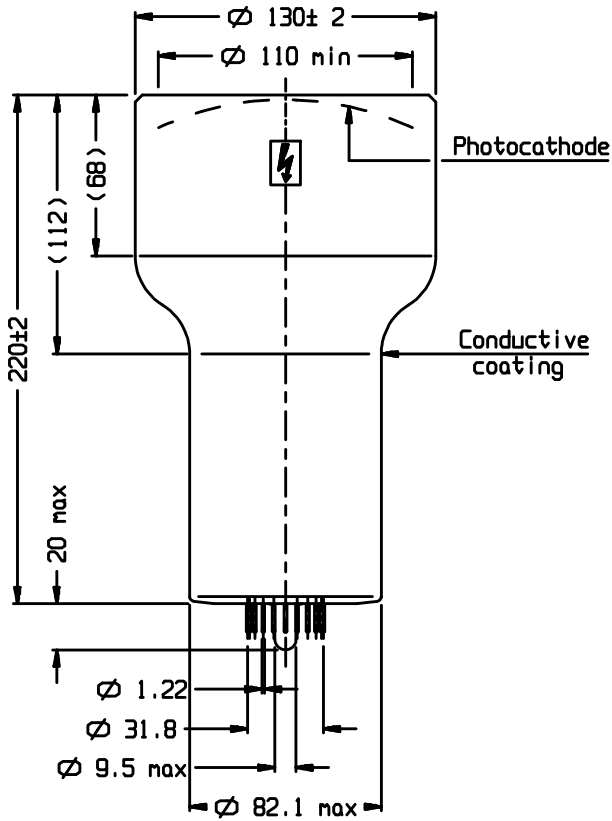
Gain :				max.:	10 ⁸		
Supply voltage :				max.:	2700	V	
Continuous anode current :				max.:	0.2	mA	
Voltage between :							
	first dynode and PK :		min.:	400	max.:	1100	V
	consecutive dynodes :				max.:	500	V
	anode and last dynode :		min.:	80	max.:	500	V
Ambient temperature :							
	short operation (< 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 $\mu\text{A/lmF}$, 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 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 $\sim 10^4$ cps, corresponding to an anode current of ~ 300 nA. The mean pulse amplitude deviation after change of count rate is measured with a ¹³⁷Cs at a distance from the scintillator such that the count rate can be changed from 10^4 to 10^3 cps, 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 It is recommended that the tube is screened from magnetic fields by a mu-metal shield protruding at least 15mm beyond the photocathode.
- 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 $(Vht)^{-1/2}$.

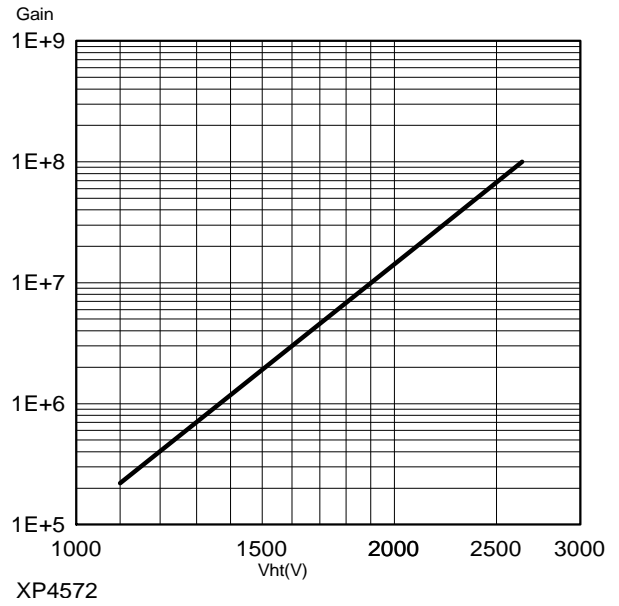
Note : The envelope of the tube is covered with a conductive coating connected to the photocathode on top of which a black paint is applied. This paint is neither guaranteed to be light-tight nor electrically insulating. Care should be taken to avoid electrical shock.



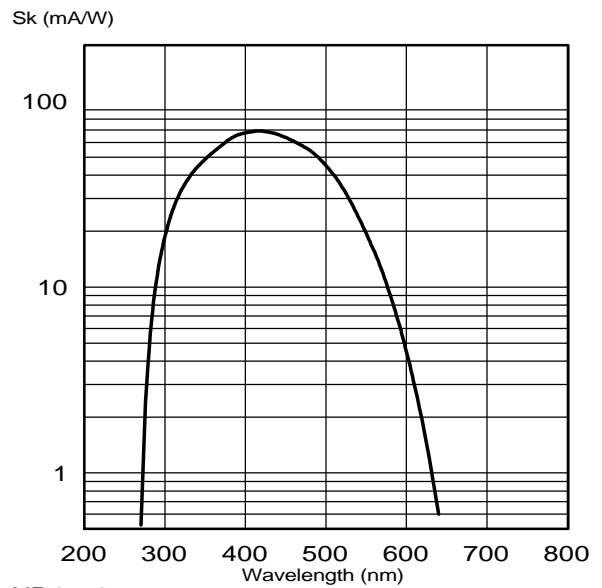
ref.: 99902387
sp: short pin
ic: internal connection
n: plane of symmetry of the multiplier

K: cathode Dn: dynode
Gn: focusing electrode
A: anode Ct: coating

Typical gain curve



Typical spectral characteristics



XP4572

Accessories

Socket : FE2019
Mu-metal shield: MS175