Fast, UV sensitive, 10-stage, 130 mm (5") round tube

Applications :	For high and medium energy physics where the number of photons to be detected is very low such as coincidence measurements and Cerenkov light detection		
Description :	Window :	Material :	UV glass
		Photocathode :	bi-alkali
		Refr. index at 420 nm :	1.48
	Multiplier :	Structure :	linear focused
		Nb of stages :	10
	Mass :	520 g	

Photocathode characteristics

	Spectral range :					200-650	nm
		Maximum sensitivity at :				420	nm
	Sensitivity ① :	Luminous :				70	µA/lm
☑		Blue :	min.:	9	typ.:	10.5	µA/lmF
		Radiant, at 420 nm :			typ.:	80	mA/W
		Quantum efficiency at 420 nm :				24	%

Characteristics with voltage divider A

	Gain slope (vs supp. volt., log/log) :					7	
	For a gain of :					$2x10^7$	
☑	Supply voltage :		max.:	2500	typ.:	2100	V
			min.:	1800			
☑	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 tube axis :				0.13	mT
	For a supply voltage of 1700 V (typical gain is $5x10^6$)						
	Linearity (2%) of anode current up to :					80	mA
	Anode pulse ⑤ :						
		Rise time :				2.5	ns
		Duration at half height :				3.8	ns
		Transit Time :				49	ns
	Capacitance	anode to all :				7	pF

PHOTONIS imaging sensors

Recommended voltage divider

Type C for timing/ linearity / gain compromise

K	G	D1	D2	D3	D4	D5	D6	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 G: focusing electrode Dn: dynode 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 ± 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.

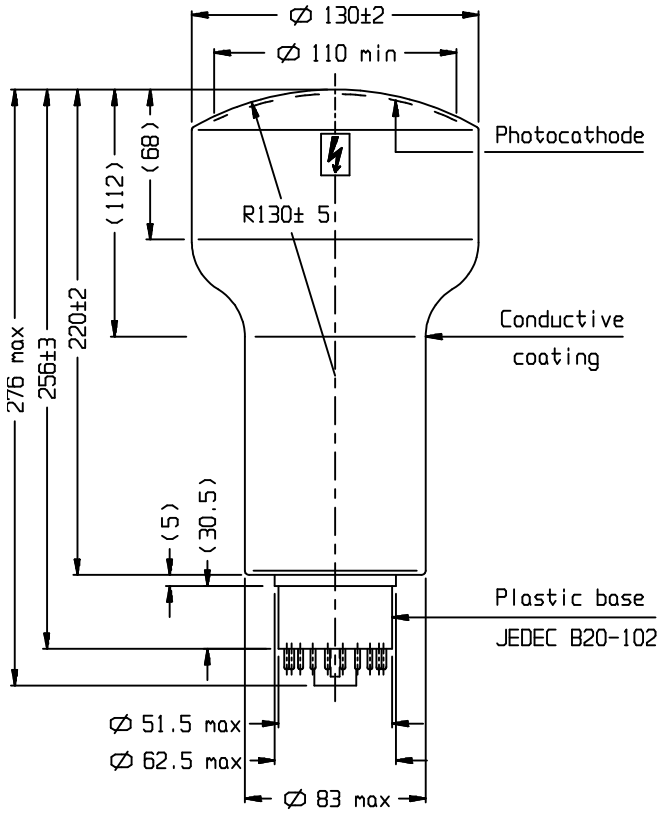
② Dark current is measured at ambient temperature, after the tube has been in darkness for approximately 1 min. Lower value can be obtained after a longer stabilisation period in darkness (approx. 30 min.).

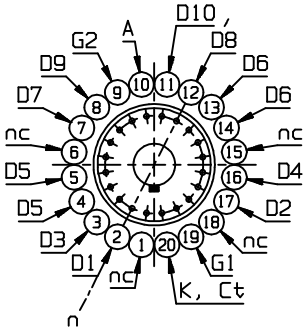
③ The mean pulse amplitude deviation is measured by coupling a NaI(Tl) scintillator to the window of the tube. Long term (16h) deviation is measured by placing a ^{137}Cs source at a distance from the scintillator such that the count rate is ~ 10^4 cps, corresponding to an anode current of ~ 300 nA. The mean pulse amplitude deviation after change of count rate is measured with a ^{137}Cs 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.

☑ It is recommended that the tube is screened from magnetic fields by a mu-metal shield protruding at least 15mm beyond the photocathode.

☑ 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.

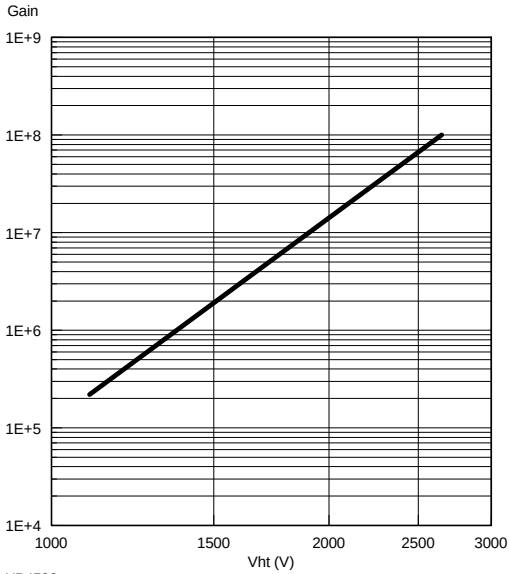




ref.: 52400008
nc: not connected
n: plane of symmetry of the multiplier

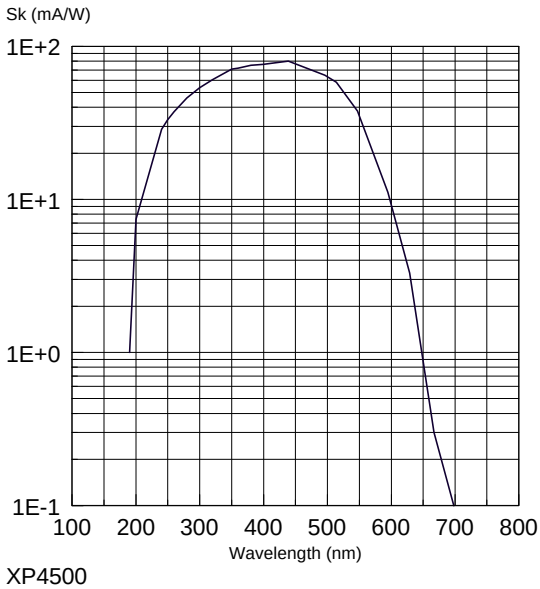
K: cathode Dn: dynode
G: focusing electrode
A: anode Ct: coating

Typical gain curve



XP4500

Typical spectral characteristics



XP4500

Accessories

Socket:	FE1120
Mu-metal shield:	MS175
Voltage divider (-HV):	VD105K
Voltage divider (+HV) :	VD305K/B

PHOTONIS imaging sensors