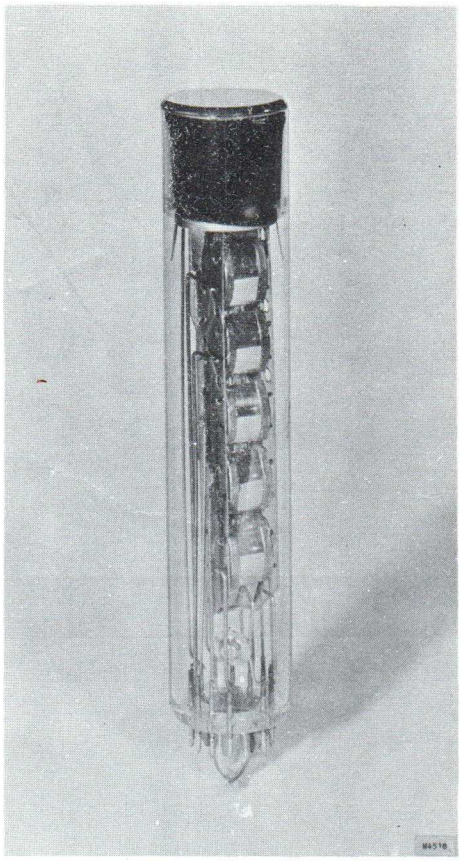
PHILIPS

52AVP

PHOTOMULTIPLIER

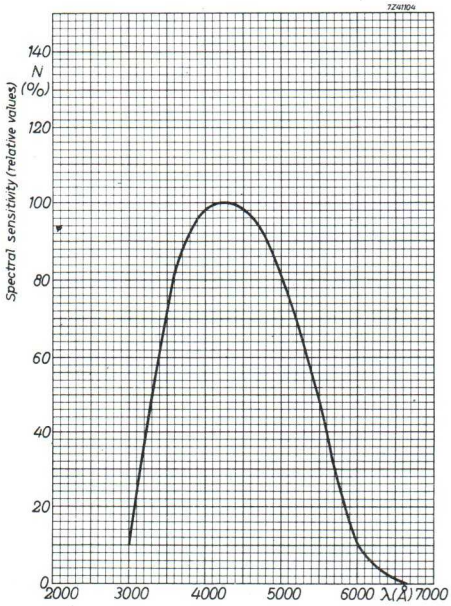


The 52AVP is a 10-stage photomultiplier tube provided with a caesium-antimony, semi-transparent flat cathode having a diameter of 20 mm. The sensitive uniform photocathode has a typical sensitivity of 60 μA/lm and a spectral response that lies mainly in the visible region, with its maximum at 4200 Å, as shown in the spectral response curve.

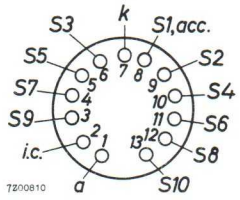
The tube is intended for use in applications such as scintillation counting, in small medical probes or in portable equipment or any optical or nuclear application in which a small diameter is required.

The total gain of the tube is approx. 3.10^6 at an overall voltage of 1800 V.

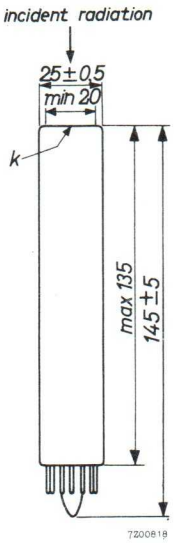
JANUARY 1962 PHILIPS' ELECTRON TUBE DIVISION



Spectral response



13-pins socket
type No. B8 700 67



Dimensions (in mm) and
electrode connections

PHOTOCATHODE

Semi-transparent, head-on, flat surface

Cathode material		SbCs	
Minimum useful diameter		20	mm
Wavelength at max. response		4200±300	Å
Luminous sensitivity [1]		avg. 60 min. 35	µA/lm µA/lm
Radiant sensitivity [2]		avg. 50	mA/W
Dark current (at t_{amb} = 25 °C)		max. 3.10^{-15}	A/cm²

MULTIPLIER SYSTEM

Number of stages		10	
Dynode material		AgMgOCs	
Capacitance between anode and final dynode	C_{a-S10} =	3	pF pF
Capacitance between anode and all other electrodes	C_a =	5	pF

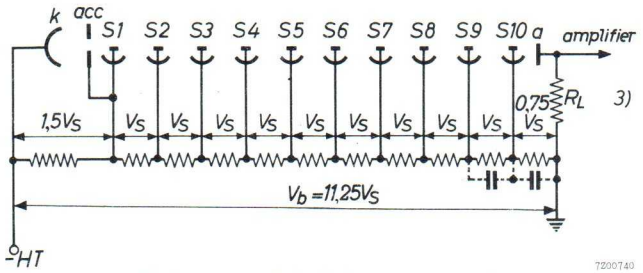
[1]) Measured with a tungsten ribbon lamp with a colour temperature of 2850 °K

[2]) At a wavelength of 4200 Å

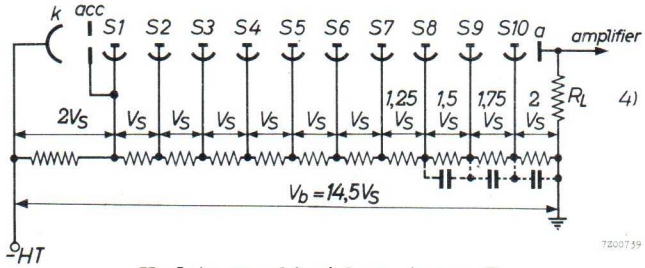
TYPICAL CHARACTERISTICS (voltage divider type A)

Anode sensitivity (at a total voltage of 1800 V)	N_a =	avg. 250	A/lm
		min. 30	A/lm
Anode dark current (at N_a = 30 A/lm)		max. 0.1	μA
Linearity between anode pulse amplitude and input-light flux:			
- with voltage divider type A		up to 5	mA
- with voltage divider type B		up to 10	mA

OPERATING CONDITIONS



Voltage divider type A



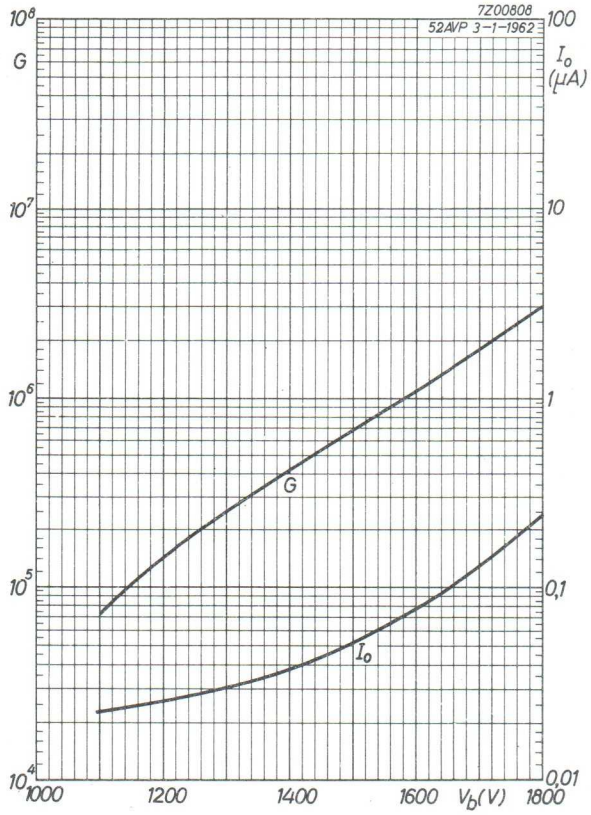
Voltage divider type B

k = cathode
acc = accelerating electrode
S_n = dynode No. **n**
a = anode

LIMITING VALUES

Total voltage	V_b	= max.	1800	V
Anode current at continuous operation (in order not to overload the tube)	I_a	= max.	1	mA
Anode dissipation	W_a	= max.	0.5	W
Voltage between cathode and first dynode	V_{k-S1}	= min.	120	V
		max.	500	V
Voltage between two consecutive dynodes	$V_{Sn-Sn+1}$	= min.	80	V
		max.	300	V
Voltage between S_{10} and anode	V_{a-S10}	= min.	80	V [3])
		max.	300	V

[3]) When calculating the anode voltage the voltage drop in the load resistance R_L should not be overlooked.



Gain and dark current

OPERATIONAL CONSIDERATIONS

To achieve a stability of about 1 % the ratio of the current through the voltage-divider bridge to that through the heaviest loaded stage of the tube should be approx. 100.

For moderate intensities of radiation a bridge current of approx. 0.5 mA will be sufficient.

With the voltage divider type A the tube gives the highest gain, while with the voltage divider type B the tube can deliver higher anode currents at the cost of the total gain.

In pulse techniques, such as scintillation counting, it is advisable to decouple the last two or three stages by means of capacitors of approx. 100 pF, to avoid a serious voltage drop between these stages during a pulse.

When the tube has been exposed to full daylight just before mounting, it will probably show an increased dark current, which will be back at its normal value after several hours of operation.

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