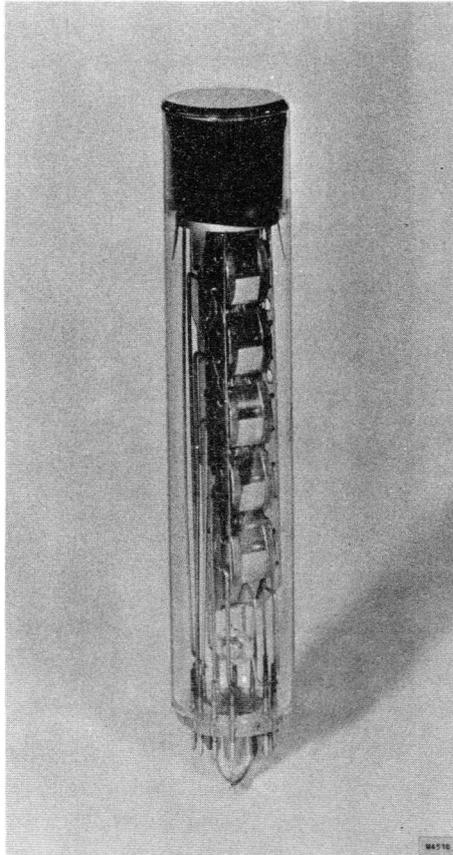


# PHILIPS

# 52AVP

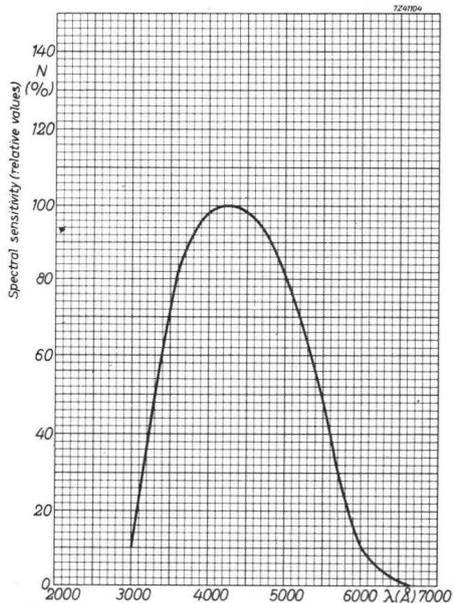
## PHOTOMULTIPLIER



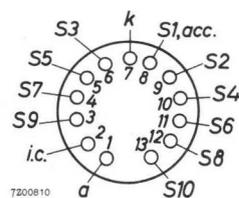
The 52AVP is a 10-stage photomultiplier tube provided with a caesium-antimony, semi-transparent flat cathode having a diameter of 20 mm. The sensitive uniform photocathode has a typical sensitivity of  $60 \mu\text{A}/\text{lm}$  and a spectral response that lies mainly in the visible region, with its maximum at  $4200 \text{ \AA}$ , 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.

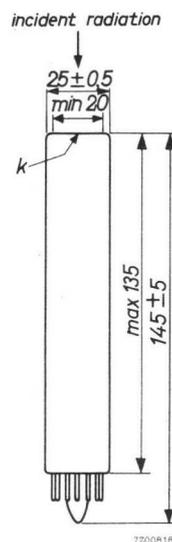
The total gain of the tube is approx.  $3 \cdot 10^6$  at an overall voltage of 1800 V.



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 <sup>1)</sup>

avg. 60 μA/lm  
min. 35 μA/lm

Radiant sensitivity <sup>2)</sup>

avg. 50 mA/W

Dark current (at  $t_{amb} = 25\text{ }^{\circ}\text{C}$ )

max.  $3 \cdot 10^{-15}$  A/cm<sup>2</sup>

MULTIPLIER SYSTEM

Number of stages

10

Dynode material

AgMgOCs

Capacitance between anode  
and final dynode

$C_{a-S10} = 3$  pF

Capacitance between anode  
and all other electrodes

$C_a = 5$  pF

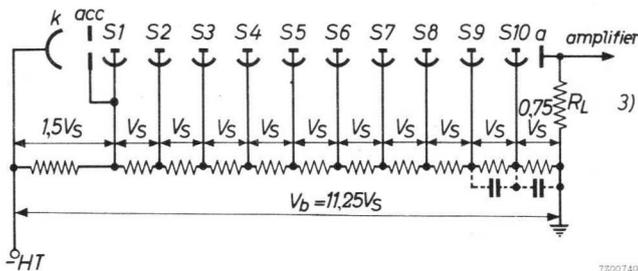
<sup>1)</sup> Measured with a tungsten ribbon lamp with a colour temperature of 2850 °K

<sup>2)</sup> 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	$\mu$ A
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

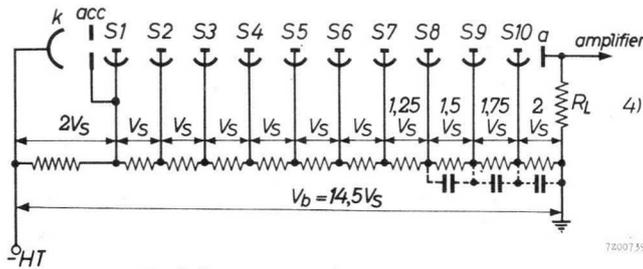
## OPERATING CONDITIONS



Voltage divider type A

7200740

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



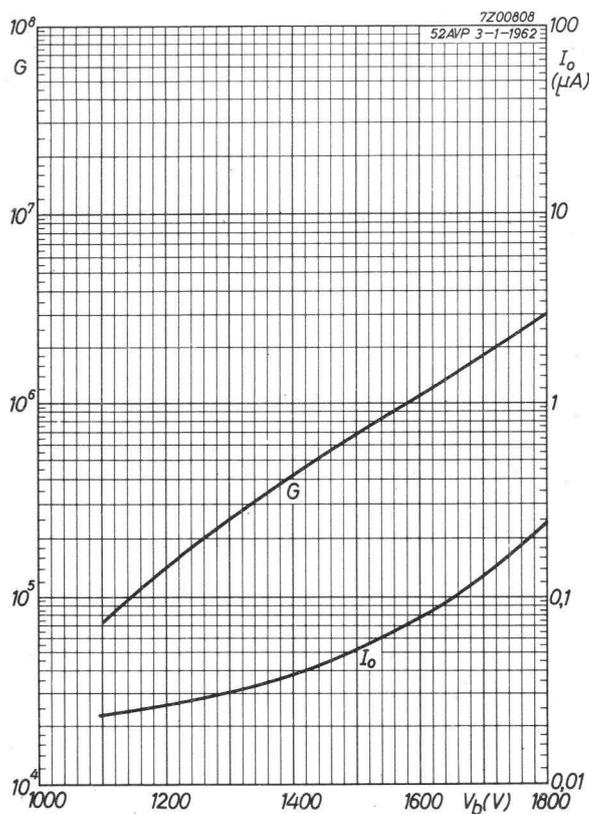
Voltage divider type B

7200739

## 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	$V_{S_n-S_{n+1}} =$	min. 80	V
		max. 300	V
Voltage between $S_{10}$ and anode	$V_{a-S_{10}} =$	min. 80	V <sup>3)</sup>
		max. 300	V

<sup>3)</sup> 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.