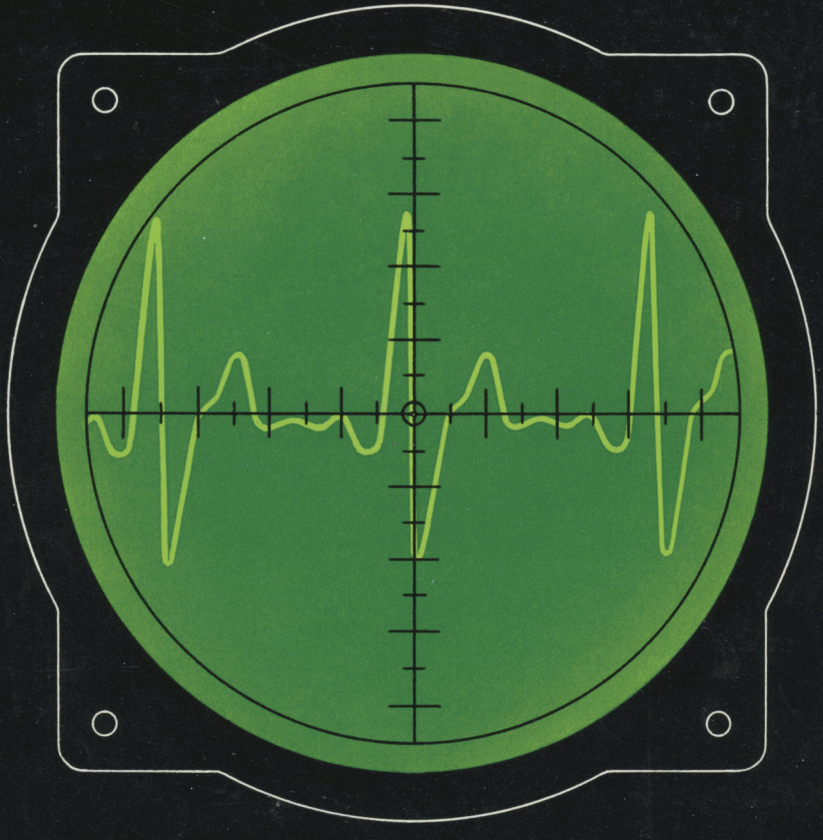
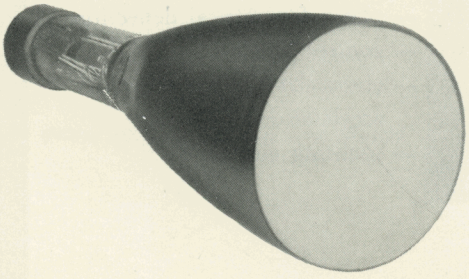
PHILIPS CATHODE-RAY TUBES

for measuring equipment





PHILIPS ELECTRON TUBE DIVISION

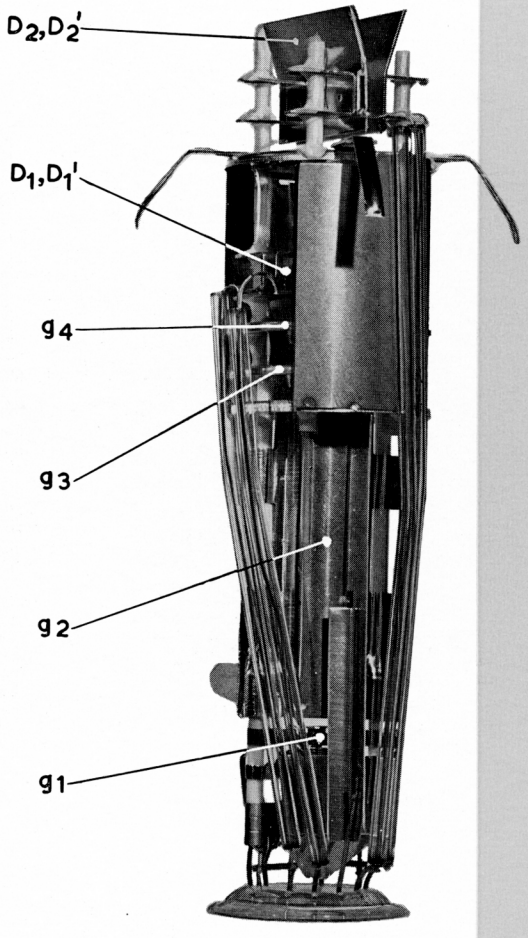
DG 13-2
DB 13-2
DP 13-2
DR 13-2

PHILIPS

GENERAL-PURPOSE CATHODE-RAY TUBE

DG 13-2
DB 13-2
DP 13-2
DR 13-2

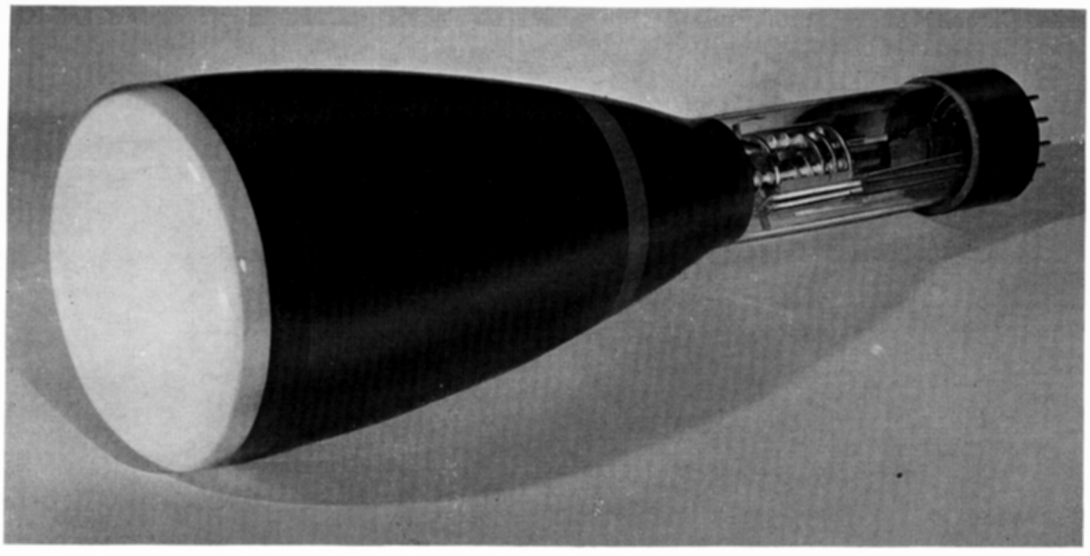
- *Independent focusing control*
- *Large screen diameter; 13 cm (5″)*
- *Symmetrical deflection*



Electron gun of the Cathode-Ray Tube DG 13-2

D_2D_2' — plates for horizontal deflection
D_1D_1' — plates for vertical deflection
g_1 — control grid
g_2,g_4 — electrodes for pre-deflection acceleration
g_3 — focusing electrode

The DG 13-2 is a general-purpose Cathode-Ray Oscilloscope Tube, with a faceplate of 13 cm (5″) diameter, featuring electrostatic double symmetrical deflection and extra high tension post-acceleration



The Philips Cathode-Ray Tube DG 13-2, has the following main features:

The focusing control is independent of the brightness control, so that the spot remains sharp when the beam-current is varied over a wide range. Owing to the very small grid No. 3 current, a low-current voltage-divider system can be used.

A large useful screen-area in relation to bulb diameter.

Symmetrical deflection, which minimizes the occurrence of distortion.

For various applications different screen types available:

G - A green screen for oscilloscopy and recording of medium- and high - frequency phenomena.

B - A blue screen for photographic recording of non-recurrent high-speed phenomena.

P - A double-layer screen with bluish fluorescence for oscilloscopy and recording of low-frequency and low-speed non-recurrent phenomena.

R - A greenish-yellow screen for oscilloscopy and recording of low- and medium-frequency signals. *)

As a result of these electrical and mechanical characteristics, this tube is particularly suitable for measuring equipment.

ELECTRICAL DATA

Screen

Tube type	Fluorescence (colour)	Persistence	
		Character	0.1 % of max. brightness after
DG 13-2	green	medium	50 millisec.
DB 13-2	blue	short	20 millisec.
DP 13-2	blue (afterglow greenish-yellow)	very long	80 sec.
DR 13-2	greenish-yellow	long	20 sec.

Heating indirect by A.C. op D.C.

Heater voltage: . . . . . V_f = 6.3 V

Heater current: . . . . . I_f = 0.3 A

Deflection double electrostatic D_1D_1' symmetric, D_2D_2' symmetric

Focusing electrostatic

Line width at V_{g5} = 2000 V

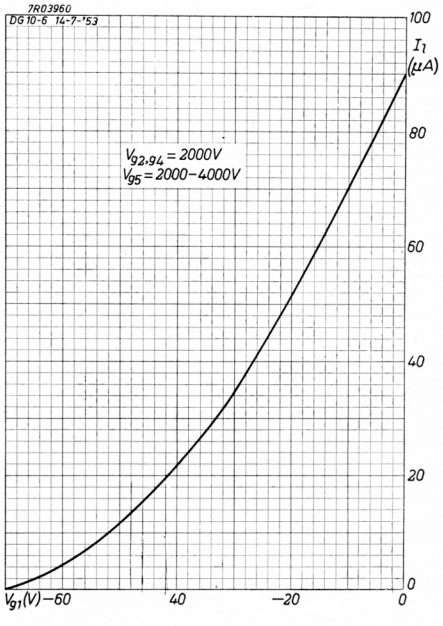
$V_{(g_2 + g_4)}$ = 2000 V 0.4 mm **)

I_l = 0.5 µA

V_{g5} = 4000 V

$V_{(g_2 + g_4)}$ = 2000 V 0.3 mm **)

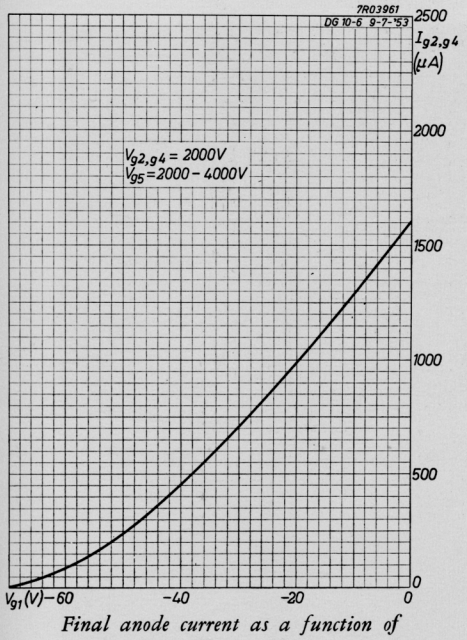
I_l = 0.5 µA



Screen current as a function of negative grid cut-off voltage

*) Detailed information on all phosphors is given in a folder dealing with data and characteristics of Philips phosphors.

**) Measured on a circle of 50 mm diameter.



Final anode current as a function of negative grid cut-off voltage

INTERELECTRODE CAPACITANCES		
Electrodes	Symbol	Value (pF)
D_1 to D_1'	$C_{D_1D_1'}$	1.9
D_2 to D_2'	$C_{D_2D_2'}$	2.5
$D_1 + D_1'$ to $D_2 + D_2'$	$C_{D_1D_1'\text{-}D_2D_2'}$	0.2
D_1 to all	C_{D_1}	4.7*)
D_1' to all	$C_{D_1'}$	4.7*)
D_2 to all	C_{D_2}	5.5*)
D_2' to all	$C_{D_2'}$	5.5*)
Grid 1 to all	C_{g1}	4.6
Cathode to all	C_k	6.0
Grid 1 to $D_1D_1'D_2D_2'$	$C_{g1\text{-}D_1D_1'D_2D_2'}$	0.15
Cathode to $D_1D_1'D_2D_2'$	$C_{k\text{-}D_1D_1'D_2D_2'}$	0.35

Operating characteristics		with post acceleration	without post acceleration
Grid No. 5 voltage	V_{g5}	= 4000	2000 V
Grid No. 2 + No. 4 voltage	$V_{(g2 + g4)}$	= 2000	2000 V
Grid No. 3 voltage	V_{g3}	= 400 720	400 720 V
Grid No. 3 current	I_{g3}	= −15 to +10	−15 to +10 μA
Negative grid No. 1 voltage **)	$-V_{g1}$	= 45 100	45 100 V
Deflection sensitivity	D_1D_1'	= 0.34 0.42	0.43 0.51 mm/V
Deflection sensitivity	D_2D_2'	= 0.29 0.37	0.37 0.45 mm/V

Limiting values (design center values)			
Grid No. 5 voltage	V_{g5}	= max.	5000 V
Grid No. 2 + No. 4 voltage	$V_{(g2 + g4)}$	= max.	2500 V
Grid No. 3 voltage	V_{g3}	= max.	1000 V
Grid No. 1 voltage (negative value)	$-V_{g1}$	= max.	150 V
Grid No. 1 voltage (positive value)	$+V_{g1}$	= max.	0 V
Peak voltage on D_1D_1	$V_{D_1D_1'p}$	= max.	450 V
Peak voltage on D_2D_2'	$V_{D_2D_2'p}$	= max.	450 V
Voltage between cathode and heater	V_{kf}	= max.	125 V
Screen dissipation	W_l	= max.	3 mW/cm²
Grid No. 2 and grid No. 4 dissipation	$W_{(g2 + g4)}$	= max.	4 W

Maximum circuit values			
Deflection plate circuit resistance	R_D	= max.	5 MΩ
Grid No. 1 circuit resistance	R_{g1}	= max.	1.5 MΩ

MECHANICAL DATA

Mounting position any

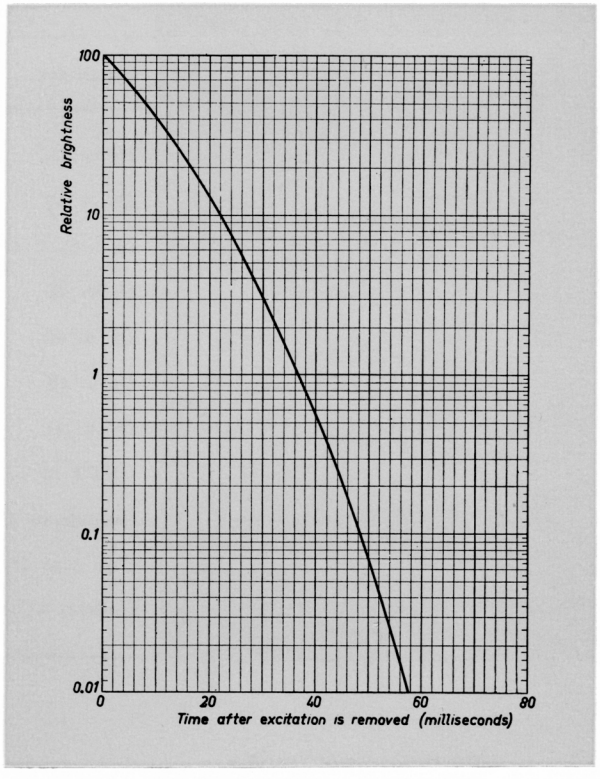
Dimensions overall-length 425 mm ($16\frac{3}{4}$″)
screen diameter 13 cm (5″)

Anode contact B1.885.06.

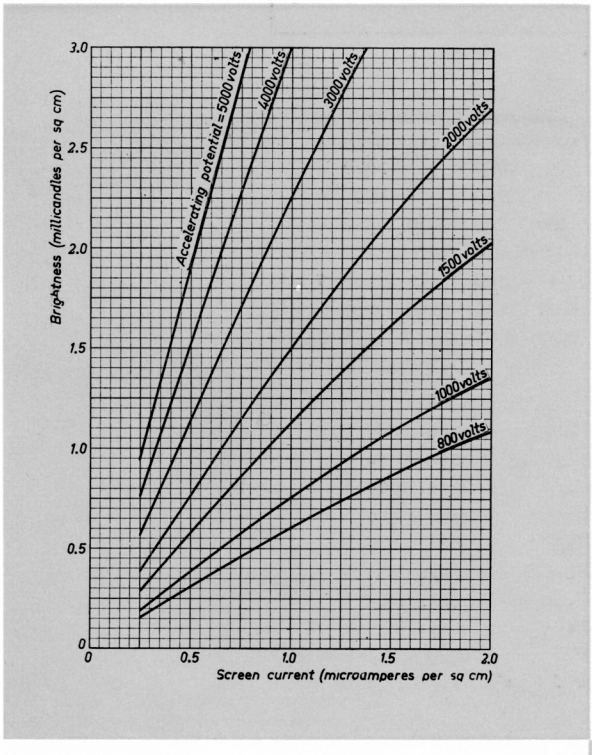
*) Except the opposite deflection plate.
**) For visual extinction of the focused spot.

G-screen

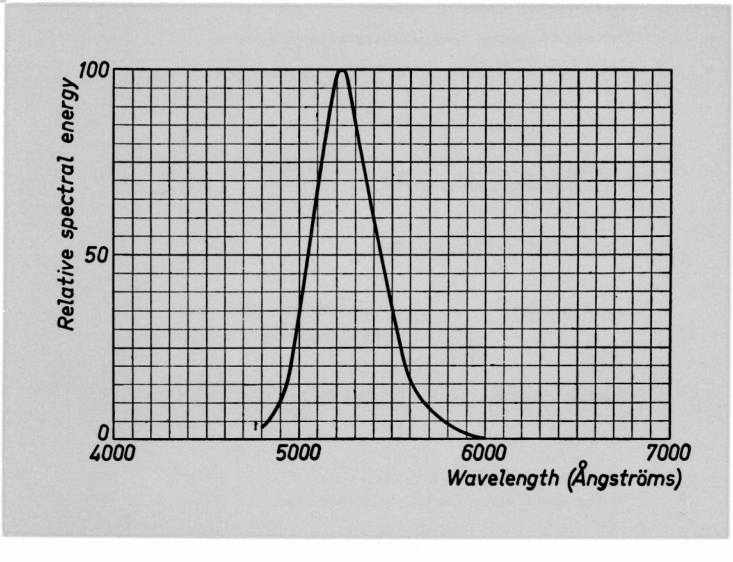
The green fluorescent G-screen provides high visual contrast under conditions of normal ambient illumination. It has medium persistence and can be used for visual observation of recurrent phenomena in the majority of applications.



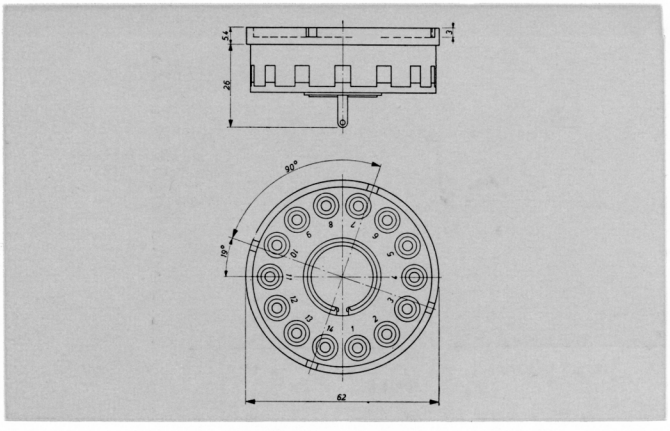
Persistence characteristic of a G-screen.



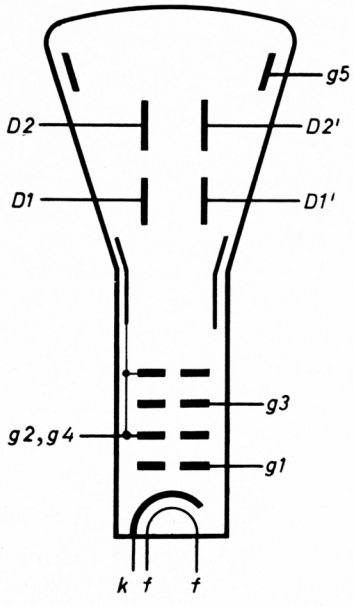
Brightness of a G-screen as a function of the screen current per square cm screen area, with the accelerating potential as a parameter.



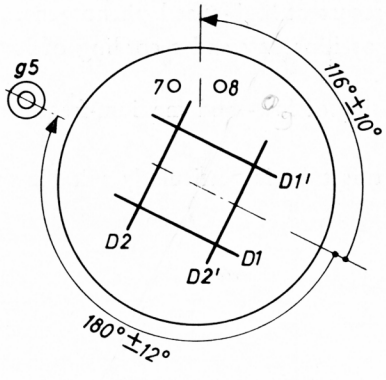
Relative spectral energy distribution of a G-screen



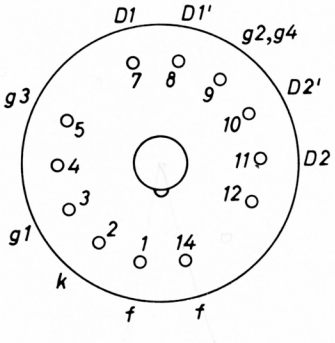
Base: Diheptal



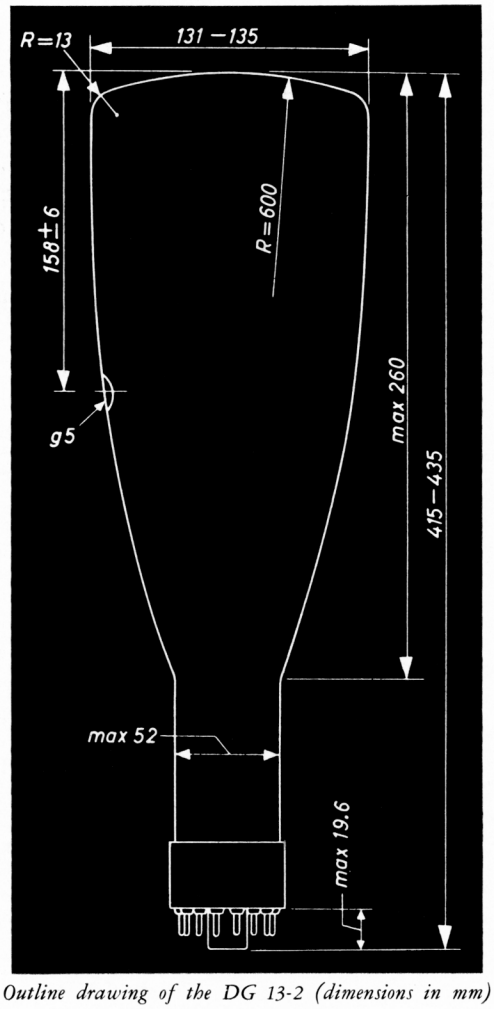
Electrode arrangement



Position of the deflection plates



Base connections



Outline drawing of the DG 13-2 (dimensions in mm)