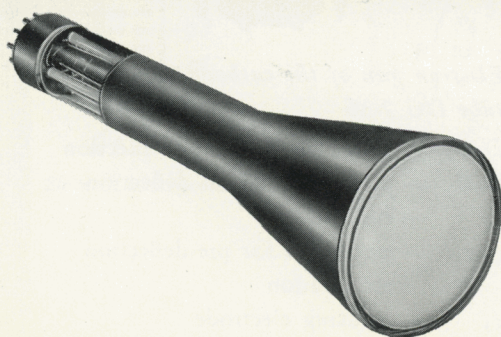
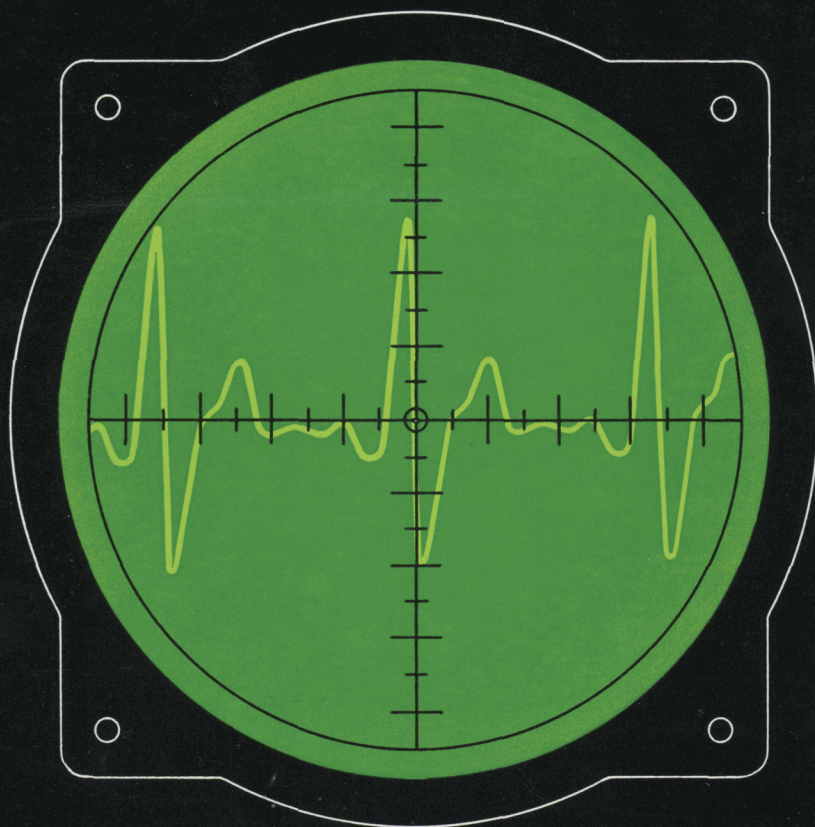


PHILIPS

CATHODE-RAY TUBES

for measuring equipment



PHILIPS ELECTRON TUBE DIVISION

7 cm Cathode-Ray Tube
for
MEASURING PURPOSES
DG 7-36

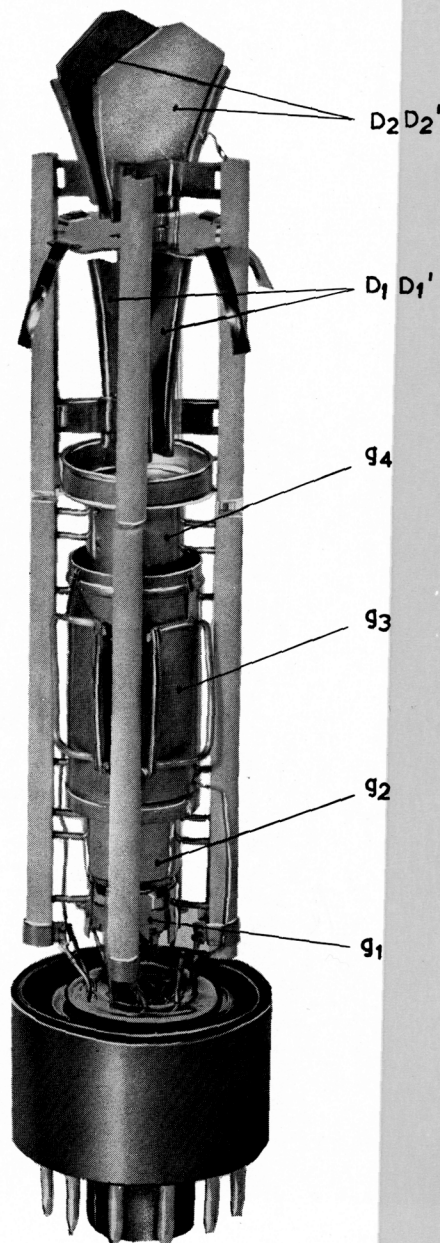
PHILIPS

7 cm CATHODE-RAY TUBE FOR MEASURING PURPOSES

DG 7-36

- *High sensitivity*
- *Flat faceplate*
- *Independent focusing control*
- *Brilliant and fine spot*
- *High-grade phosphor screen*

The DG 7-36 is a Cathode-Ray Tube for measuring purposes, with a flat faceplate of 7 cm (3'') diameter, featuring electrostatic focusing and highly sensitive, electrostatic double symmetric deflection. The tube has especially been designed for use in applications where close tolerances in the electrical and mechanical characteristics are of prime importance.



Electron gun of the cathode-ray tube DG 7-36

- 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 Philips Cathode-Ray Tube DG 7-36 has the following main features:

Very high deflection sensitivity, permitting the use of smaller amplifiers, both for the time-base and the signal under examination.

The plane parallel faceplate of high-quality glass ensures correct reading, drawing or photographic recording of the oscillograms without parallax.

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 current drawn by the focusing electrode, a low-current voltage-divider system can be used.

Thanks to the high-grade phosphor screen, high brilliancy at small spot dimensions is achieved. As a result of these very interesting electrical and mechanical characteristics, the DG 7-36 is an outstanding type for measuring equipment with a high standard of accuracy.

ELECTRICAL DATA

Heating:
 Indirect by A.C. or D.C.; parallel supply
 Heater voltage 6.3 V
 Heater current 0.3 A

Screen:
 Fluorescence: green
 Persistence : medium

Focusing: Electrostatic

Deflection: Double electrostatic
 D_1D_1' symmetric
 D_2D_2' symmetric
 Angle between D_1D_1' and D_2D_2' traces
 $90^\circ \pm 1^\circ$

Line width at:
 $V_{(g_2+g_4)} = 1500 \text{ V}$
 $I = 0.5 \text{ } \mu\text{A}$ 0.4 mm ¹⁾

INTERELECTRODE CAPACITANCES		
Electrodes	Symbol	Cap. (pF)
D_1 to D_1'	CD_1D_1'	1.7
D_2 to D_2'	CD_2D_2'	1.9
D_1 to all	CD_1	4.7
D_1' to all	CD_1'	4.7
D_2 to all	CD_2	6.0
D_2' to all	CD_2'	6.0
Grid 1 to all	C_{g1}	5.7
Cathode to all	C_k	3.3

1) Measured on a circle of 50 mm diameter
 2) To all electrodes, except the opposite deflection plate.

Operating characteristics

Grid No. 2 and grid No. 4 voltage	$V_{(g_2 + g_4)}$	=	1500 V
Grid No. 3 voltage	V_{g_3}	=	247-397 V ³⁾
Negative grid No. 1 voltage for visual extinction of the focused spot	$-V_{g_1}$	=	40- 80 V
Deflection sensitivity	$D_1 D_1'$	=	0.49-0.59 mm/V
Deflection sensitivity	$D_2 D_2'$	=	0.33-0.41 mm/V
Minimum useful screen diameter	$D_1 D_1'$	=	57 mm ⁴⁾
	$D_2 D_2'$	=	68 mm ⁵⁾
Variation of the linearity of deflection		=	max. 2 % ⁶⁾

Pattern distortion

The length of the edges of a raster pattern, whose mean dimensions are smaller than 75 % of the useful scan will not deviate from this mean dimensions by more than 2.5 %.

Spot position

With the tube shielded the undeflected spot will be within a circle of 4 mm radius, the circle being centered with respect to the tube face.

Limiting values (design centre values)

Grid No. 2 and grid No. 4 voltage	$V_{(g_2 + g_4)}$	=	max. 2500 V min. 1000 V
Grid No. 3 voltage	V_{g_3}	=	max. 1000 V ³⁾
Grid No. 1 voltage (negative value)	$-V_{g_1}$	=	max. 200 V
Grid No. 1 voltage (positive value)	$+V_{g_1}$	=	max. 0 V
Positive peak voltage at grid No. 1	$+V_{g_1 p}$	=	max. 2 V
Peak voltage between grid No. 2 and grid No. 4 and any of the deflection plates	$V_{D-(g_2+g_4)p}$	=	max. 500 V ⁷⁾
Voltage between cathode and heater	V_{kf}	=	max. 180 V
Screen dissipation	W_l	=	max. 3 mW/cm ²
Grid No. 2 and grid No. 4 dissipation	$W_{(g_2 + g_4)}$	=	max. 6 W

Circuit design values

Grid No. 3 voltage	V_{g_3}	=	165- 265 V	} Per 1000 volts of grid No. 2 and grid No. 4 voltage
Negative grid No. 1 voltage	$-V_{g_1}$	=	27- 53 V	
Deflection factor	$D_1 D_1'$	=	11.2-13.7 V/cm	
	$D_2 D_2'$	=	16.2-20.0 V/cm	
Deflection plate circuit resistance	R_D	=	5 MΩ ⁸⁾	
Grid No. 1 circuit resistance	R_{g_1}	=	1.5 MΩ	

MECHANICAL DATA

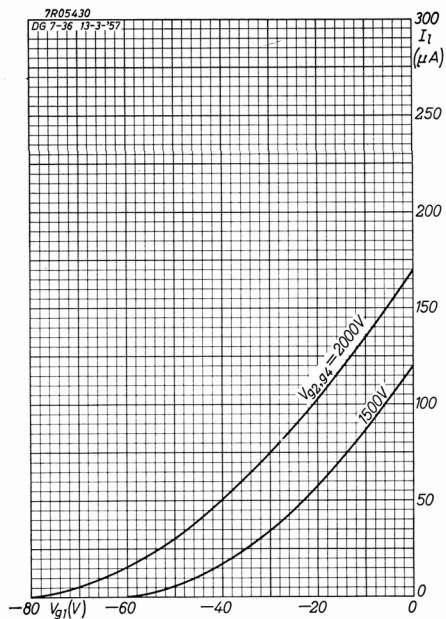
Mounting position: any

Dimensions: overall length 296 mm (11²¹/₃₂"")
screen diameter 7 cm (3")

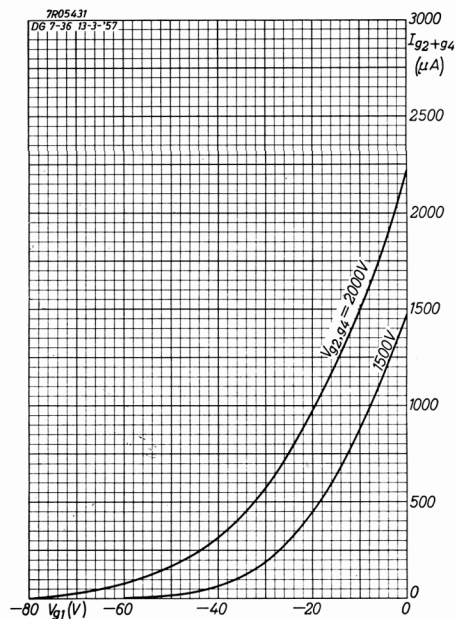
Net weight: approx. 370 g (13 ounces)

Base: Duodecal 12-p

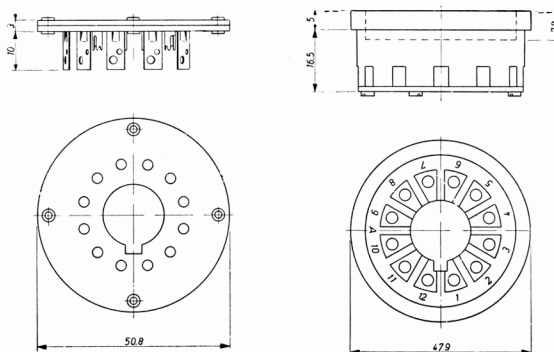
- 3) For calculation of the grid No. 3 potentiometer a grid No. 3 current of min. -15 μA and max. +10 μA must be taken into account.
- 4) Min. 28.5 mm at both sides from the tube face centre.
- 5) Min. 34 mm at both sides from the tube face centre.
- 6) The sensitivity of the deflection plates for a deflection smaller than 75 % of the useful scan will not differ from the sensitivity for a deflection of 25 % of the useful scan by more than the indicated value.
- 7) For optimum focus the average potentials of the deflection plates and grid No. 2 and 4 should be equal.
- 8) The deflection plate resistances should be approximately equal.



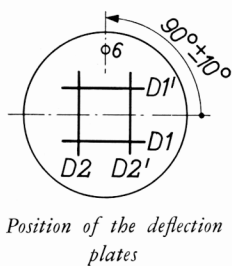
Screen current as a function of negative grid cut-off voltage



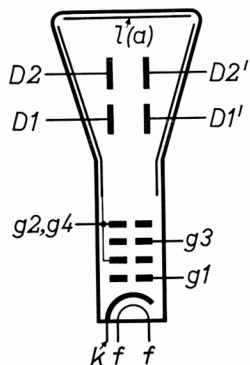
Final anode current as a function of negative grid cut-off voltage



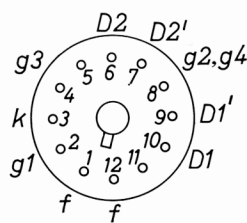
Base: duodecal 12-pins; type number 5912/20



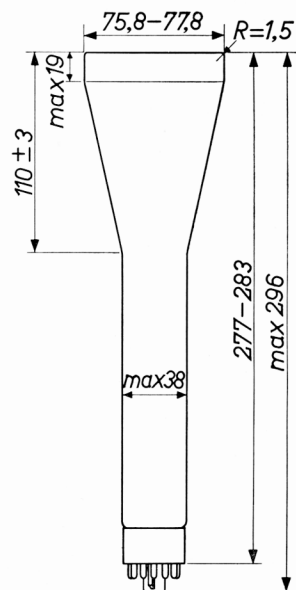
Position of the deflection plates



Electrode arrangement



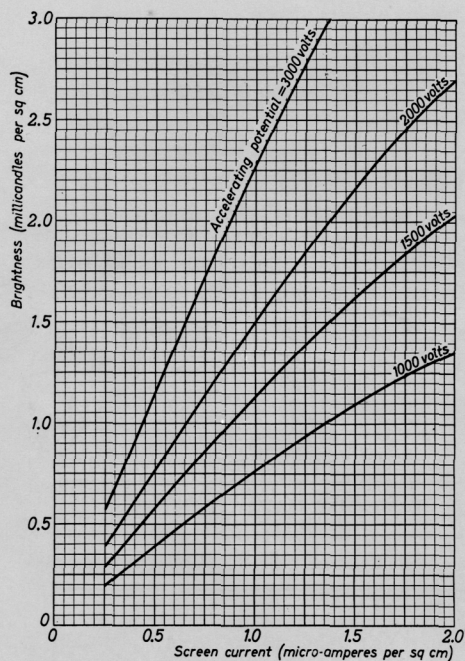
Base connections



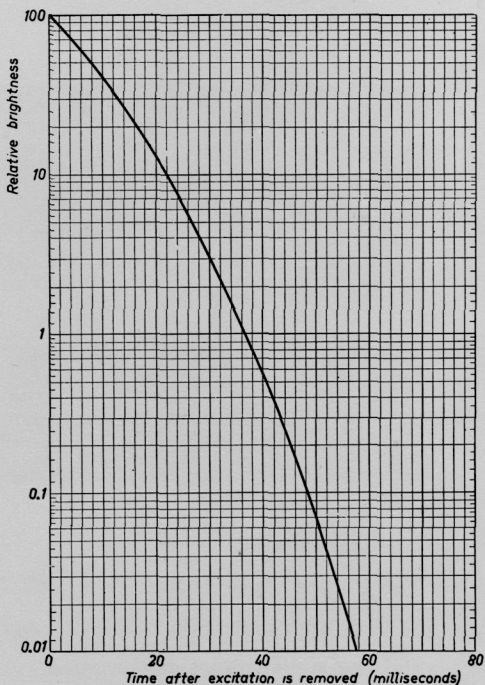
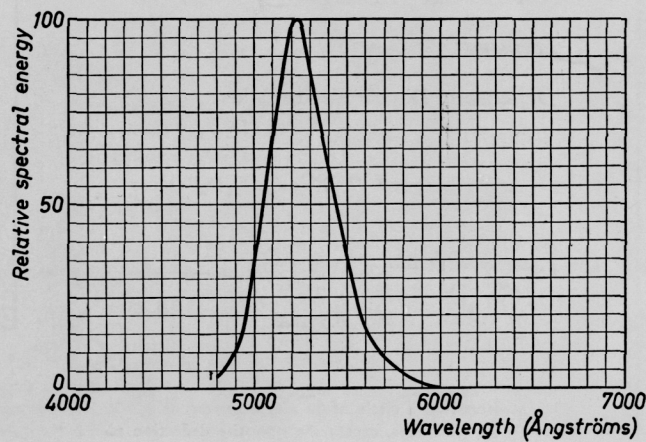
Outline drawing of the DG 7-36 (dimensions in mm)

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.



Relative spectral energy distribution of a G-screen



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.