

OSCILLOSCOPE TUBE with flat face, post deflection acceleration by means of a helical electrode and all glass base

SCREEN

Type	Fluorescence	Phosphorescence	Persistence
D10-12BE	Blue	Blue	Medium short
D10-12GH	Green	Green	Medium short
D10-12GL	Yellowish green	Yellowish green	Medium short
D10-12GM	Purplish blue	Yellowish green	Long

Useful screen diameter 90 mm

Useful scan at $V_{g6}/V_{g4} = 4$

in the x direction full scan

in the y direction 60 mm

The useful scan may vertically be shifted max. 4 mm with respect to the geometric centre of the face plate

For further screen properties please refer to front of this section

HEATING

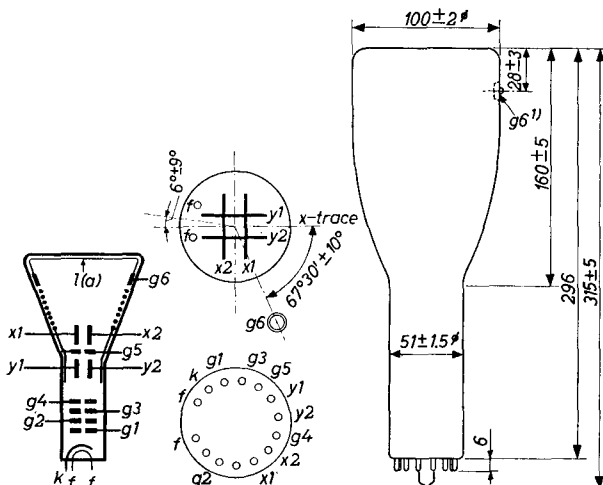
Indirect by A.C. or D.C.; parallel supply

Heater voltage $V_f = 6.3 \text{ V}$

Heater current $I_f = 0.3 \text{ A}$

CAPACITANCES

Grid No.1 to all other electrodes	C_{g1}	=	4.0 pF
Cathode to all other electrodes	C_k	=	3.0 pF
x_1 plate to all other electrodes except x_2 plate	C_{x1}	=	4.0 pF
x_2 plate to all other electrodes except x_1 plate	C_{x2}	=	4.0 pF
y_1 plate to all other electrodes except y_2 plate	C_{y1}	=	3.0 pF
y_2 plate to all other electrodes except y_1 plate	C_{y2}	=	3.0 pF
x_1 plate to x_2 plate	C_{x1-x2}	=	2.0 pF
y_1 plate to y_2 plate	C_{y1-y2}	=	1.7 pF



Dimensions in mm

Base: 14 p. all glass

g_5 = isolation shield

The post accelerator helix is connected between g_6 and g_5
The resistance of the helix is min. 50 MΩ

MOUNTING POSITION: any

The tube should not be supported by the base alone

ACCESSORIES

Socket 55566

Mu-metal shield 55541

NET WEIGHT 660 g

¹) Recessed small ball cap

<u>FOCUSING</u>	electrostatic
<u>DEFLECTION</u>	double electrostatic
x plates	symmetrical
y plates	symmetrical
Angle between x and y traces $90^{\circ} \pm 1^{\circ}$	

LINE WIDTH

Post accelerator voltage	$V_{g6} = 4000 \text{ V}$
Grid No.4 voltage	$V_{g4} = 1000 \text{ V}$
Grid No.2 voltage	$V_{g2} = 1000 \text{ V}$
Beam current	$I_b = 10 \mu\text{A}$
Line width	$l.w. = 0.35 \text{ mm}$

OPERATING CHARACTERISTICS

Post accelerator voltage	$V_{g6} = 4000 \text{ V}$
Isolation shield voltage	$V_{g5} = 1000 \pm 100 \text{ V } ^1)$
Second accelerator voltage	$V_{g4} = 1000 \pm 50 \text{ V } ^1)$
Focusing electrode voltage	$V_{g3} = 20 \text{ to } 200 \text{ V}$
First accelerator voltage	$V_{g2} = 1000 \text{ V}$
Grid No.1 voltage	$V_{g1} = -25 \text{ to } -67 \text{ V } ^2)$
Deflection factor	
horizontal	$M_x = \text{max. } 31 \text{ V/cm}$
vertical	$M_y = \text{max. } 11.2 \text{ V/cm}$
Deviation of linearity of deflection	$= \text{max. } 2 \% ^1)^3)$
Pattern distortion	$= \text{max. } 2 \% ^1)^4)$
Undelected spot position	$R = 5 \text{ mm } ^5)$

¹⁾²⁾³⁾⁴⁾⁵⁾ See page 4

- ¹) In general the voltages on g_5, g_4 and the average potential of the deflection plates should be equal

Variation of the isolation shield voltage (max. 10% of V_{g_4}) serves to correct pincushion and barrel pattern distortion

A small potential difference (max. $\pm 5\%$ of V_{g_4} , obtained by varying V_{g_4}) between the y plates and g_4 may be desirable for obtaining optimum sharpness

- ²) For visual extinction of the focused spot
- ³) The sensitivity (of both x and y plate pairs separately) for a deflection of less than 75% of the useful scan will not differ more than 2% from the sensitivity for a deflection of 25% of the useful scan
- ⁴) With a vertical or horizontal line which is adjusted so that the centre of the line touches the sides of a square of 51 mm, no points of the centre of the line will be within a concentric square of 49 mm
- ⁵) With the tube shielded the spot will be within a circle of 5 mm radius, the circle being centered with respect to the tube face
- ⁶) If use is made of the full deflection capabilities of the tube, the deflection plates will intercept part of the electron beam near the edge of the scan; a low impedance deflection plate drive is therefore desirable
- ⁷) Values to be taken into account for the calculation of the V_{g_5} -potentiometer

LIMITING VALUES (Absolute limits)

Post accelerator voltage	V_{g6}	= max. 5000 V = min. 1500 V
Isolation shield voltage	V_{g5}	= max. 2200 V
Second accelerator voltage	V_{g4}	= max. 2200 V = min. 1000 V
Focusing electrode voltage	V_{g3}	= max. 1500 V
First accelerator voltage	V_{g2}	= max. 2200 V = min. 1000 V
Grid No.1 voltage		
negative	$-V_{g1}$	= max. 200 V
positive	$+V_{g1}$	= max. 0 V
peak positive	$+V_{g1p}$	= max. 2 V
Ratio V_{g6}/V_{g4}	V_{g6}/V_{g4}	= max. 4
Peak voltage between second accelerator and any deflec- tion plate	$V_{g4-x\ p}$ $V_{g4-y\ p}$	= max. 500 V = max. 500 V
Voltage between cathode and heater		
cathode positive	$V_{kf}(k\ pos)$	= max. 200 V
cathode negative	$V_{kf}(k\ neg)$	= max. 125 V
Accelerator grids		
dissipation	$W_{g2, g4}$	= max. 6 W
Screen dissipation	W_{ℓ}	= max. 3 mW/cm ²

CIRCUIT DESIGN VALUES

Focusing voltage	$V_{g3} = 50\ to\ 200\ V$	per kV of $V_{g2, g4}$
Grid No.1 voltage ²⁾	$-V_{g1} = 25\ to\ 67\ V$	per kV of V_{g2}
Deflection factors at $V_{g6}/V_{g2, g4} = 4$		
horizontal	$M_x = \max. 31\ V/cm$	per kV of V_{g4}
vertical	$M_y = \max. 11.2\ V/cm$	per kV of V_{g4}
Grid No.1 circuit resistance	$R_{g1} = \max. 1.5\ M\Omega$	
Deflection plate resistance	$R_x = R_y = 6)$	
Grid No.3 current	$I_{g3} = -30\ to\ +10\ \mu A$	⁷⁾

^{2) 6) 7)} See page 4



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6	FP		2000.01.21