General purpose DOUBLE GUN OSCILLOSCOPE TUBE with 9 cm flat face, side connected y plates and separate x plates

SCREEN

For 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 V
Heater current $I_f$ = 1.25 A

CAPACITANCES

| | | | |
|---|---|---|---|
| $C_{g_1}$ | = 5.2-7.4 pF | $C_{g_1'}$ | = 5.0-7.2 pF |
| $C_k$ | = 3.0-4.6 pF | $C_k'$ | = 3.0-4.6 pF |
| $C_{x_1}$ | = 4.5-6.5 pF | $C_{x_1'}$ | = 4.5-6.5 pF |
| $C_{x_2}$ | = 4.6-7.2 pF | $C_{x_2'}$ | = 4.6-7.2 pF |
| $C_{y_1}$ | = 2.0-4.0 pF | $C_{y_1'}$ | = 2.8-4.4 pF |
| $C_{y_2}$ | = 2.8-4.4 pF | $C_{y_2'}$ | = 2.0-4.0 pF |
| $C_{x_1-x_2}$ | < 1.7 pF | $C_{x_1'-x_2'}$ | < 1.7 pF |
| $C_{y_1-y_2}$ | = 1.5-2.5 pF | $C_{y_1'-y_2'}$ | = 1.5-2.5 pF |
| $C_{(x_1+x_2)-(y_1+y_2)}$ | < 0.2 pF | $C_{(x_1'+x_2')-(y_1'+y_2')}$ | < 0.2 pF |

$C_{(x_1+x_2)-(x_1'+x_2')}$ < 1.6 pF

$C_{(y_1+y_2)-(y_1'+y_2')}$ < 0.6 pF

FOCUSING Electrostatic

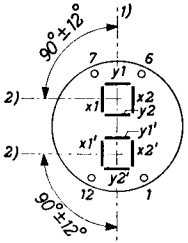
To obtain the highest possible focus performance, it may be desirable to adjust the mean potential of the deflection plates with respect to the grids No.2 and 4

DEFLECTION Double electrostatic; symmetrical

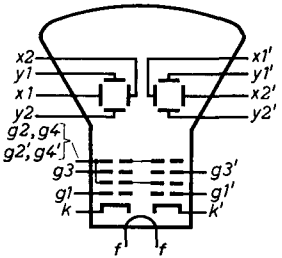
Each gun may be operated asymmetrically, but focus quality will detoriorate and trapezium distortion will be introduced

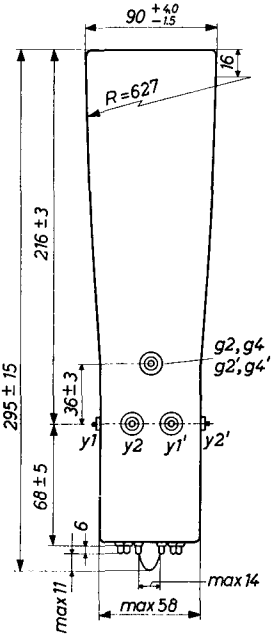
Deflection factors

x plates: $M_x$ = 13.8 to 18.2 V/cm
y plates: $M_y$ = 9.1 to 12.2 V/cm
} per kV of $V_{g_2,g_4}$

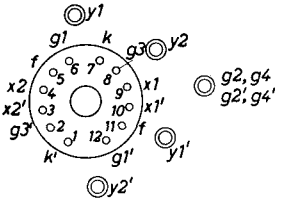


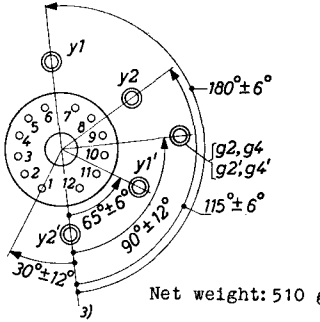

Orientation of axes of deflection as viewed from the screen end (see also page 3)




Axial distance between the radial planes through any two y connectors max. 2.5 mm




Dimensions in mm

Base: B12F

Net weight: 510 g

[1])[2])[3]) See page 3.

ORIENTATION OF THE ELECTRICAL AXES

The angle between the x and y axes of each gun is $90^{\circ} \pm 1.5^{\circ}$

The angle between the two x axes is max. $1.5^{\circ}$

The angle between the two y axes is max. $2.5^{\circ}$

The distance between the two y axes at the geometric screen centre is max. 3.5 mm

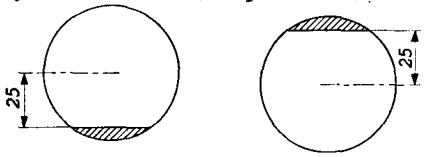
ACCESSORIES

| | |
|---|---|
| Socket | 55562 |
| Side contact connector | 55560 |
| Mu metal shield | 55533 |

USEFUL SCAN

In the x direction: full scan

In the y direction: unshaded portions in the figure below

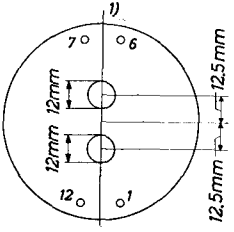



LINE WIDTH, measured on a circle of 50 mm diameter with symmetrical operation

| | | | |
|---|---|---|---|
| Accelerator voltage | $V_{g2,g4}$ | = | 1.5 kV |
| Focusing voltage | $V_{g3}$ | = | adjusted for focus |
| Beam current | $I_{\ell}$ | = | 1.0 μA |
| Line width | l.w. | = | max. 0.8 mm |

SPOT POSITION

With the tube magnetically shielded, the undeflected spot of each gun will fall within the appropriate 12 mm circle shown in the figure below




MOUNTING POSITION: any

---

1) Line drawn midway between pins 1,12 and 6,7
2) Angle between this line and y axes max. $12^{\circ}$
3) Electrical x axes
3) Reference line through the $y_2'$ connector

OPERATING CHARACTERISTICS, each electron gun

| | | | |
|---|---|---|---|
| Accelerator voltage | | $V_{g2,g4}$ | = 1.5 kV |
| Focusing voltage | | $V_{g3}$ | = 330 to 470 V |
| Negative grid No.3 current | | $-I_{g3}$ | = max. 125 μA [1]) |
| Negative grid No.1 voltage for visual cut-off | | $-V_{g1}$ | = 42 to 95 V [2]) |
| Deflection factors | x plates | $M_x$ | = 23 V/cm [2]) |
| | y plates | $M_y$ | = 16 V/cm [2]) |

Raster distortion max.±2.5 % with symmetrical operation

Centred at the screen centre, a nominally square pattern of either gun separately may be inserted into the frame bounded by the squares 48.75 mm and 51.25 mm

Raster misalignment max. ± 4 % with symmetrical operation

When two nominally square rasters, whose edges coincide at their centres, are superimposed at the screen centre, the edges may be inserted into the frame bounded by the squares 48 mm and 52 mm

LIMITING VALUES (Absolute limits)

| | | |
|---|---|---|
| Accelerator voltage | $V_{g2,g4}$ | = max. 1.8 kV<br>= min. 1.0 kV |
| Focusing voltage | $V_{g3}$ | = max. 600 V |
| Negative grid No.1 voltage | $-V_{g1}$ | = max. 200 V<br>= min. 1 V |
| Grid No.1 circuit resistance | $R_{g1}$ | = max. 1 MΩ |
| Peak voltage between each deflection plate and grids No.2 and 4 | $V_{g2,g4-x\ p}$<br>$V_{g2,g4-y\ p}$ | = max. 300 V<br>= max. 300 V |
| External resistance between each deflection plate and grids No.2 and 4 | $R_{g2,g4-x}$<br>$R_{g2,g4-y}$ | = max. 2 MΩ<br>= max. 2 MΩ |
| Total dissipation | $W_{tot}$ | = max. 2 W |
| Screen dissipation (both guns together) | $W_{\ell}$ | = max. 3 mW/cm² |
| Peak voltage between heater and cathode | $V_{kfp}$ | = max. 250 V |

[1]) With $V_{g1}$ = -1.0 V and $V_{g3}$ set for focus

[2]) Proportional to $V_{g2,g4}$

PHILIPS

Electronic Tube HANDBOOK

**DHM9-11**

| page | sheet | date |
|---|---|---|
| 1 | 1 | 1963.03.03 |
| 2 | 2 | 1963.03.03 |
| 3 | 3 | 1963.03.03 |
| 4 | 4 | 1963.03.03 |
| 5 | FP | 2000.09.24 |