

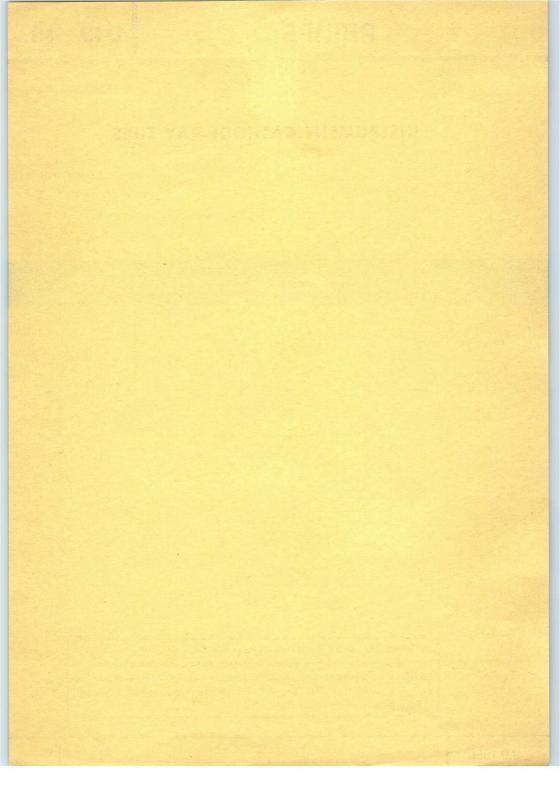
D13-48..

## **INSTRUMENT CATHODE-RAY TUBE**

# development sample data

Development samples are distributed without guarantee for further supply. Development sample data represent the characteristics and ratings of development samples and are to be regarded as first indications of the ultimate performance to be achieved by the product in preparation.

9.9.1966



### **INSTRUMENT CATHODE-RAY TUBE**

13 cm diameter flat faced monoaccelerator oscilloscope tube primarily intended for use in inexpensive oscilloscopes and read-out devices.

| QUICK REFERENCE DATA          |                           |            |                 |  |  |
|-------------------------------|---------------------------|------------|-----------------|--|--|
| Accelerator voltage           | $V_{g_2, g_4, g_5}(\ell)$ | 2000       | v               |  |  |
| Display area                  | 2 1 0                     | 100 x 80   | mm <sup>2</sup> |  |  |
| Deflection factor, horizontal | M <sub>x</sub>            | approx. 30 | V/cm            |  |  |
| vertical                      | My                        | approx. 15 | V/cm            |  |  |

SCREEN

|          | colour | persistence  |
|----------|--------|--------------|
| D13-48GH | green  | medium short |

Useful screen diameter

Useful scan at  $Vg_2, g_4, g_5(\ell) = 2000 V$ 

| horizontal | min. | 100 | mm |
|------------|------|-----|----|
| vertical   | min. | 80  | mm |

vertical min. 80 mm

The useful scan may be shifted vertically to a max. of  $5 \, \text{mm}$  with respect to the geometric centre of the faceplate.

### HEATING: Indirect by A.C. or D.C.; parallel supply

| Heater voltage | Vf | 6.3 V  |
|----------------|----|--------|
| Heater current | If | 300 mA |

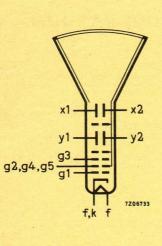
7Z2 7548

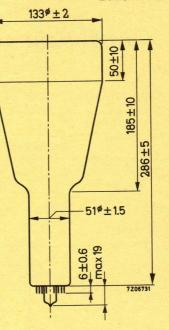
min. 114 mm

D13-48.

### MECHANICAL DATA

Dimensions in mm





### CONNECTIONS INDICATED ON SAMPLES

### Mounting position: any

The tube should not be supported by the base alone and under no circumstances should the socket be allowed to support the tube.

| Dimensions and connections  |         |      |      |
|-----------------------------|---------|------|------|
| See also outline drawing    |         |      |      |
| Overall length              | max.    | 310  | mm   |
| Face diameter               | max.    | 135  | mm   |
| Base 14 pin all glass       |         |      |      |
| Net weight                  | approx. | 650  | g    |
| Accessories                 |         |      |      |
| Socket (supplied with tube) | type 5  | 5566 |      |
| Mu-metal shield             | type    | 7Z2  | 7549 |

# PHILIPS

## D13-48..

### CAPACITANCES

| $x_1$ to all other elements except $x_2$ | $C_{x_1(x_2)}$                    | 4   | pF |
|--|-----------------------------------|-----|----|
| $x_2$ to all other elements except $x_1$ | $C_{x_2(x_1)}$                    | 4   | pF |
| $y_1$ to all other elements except $y_2$ | C <sub>y1</sub> (y <sub>2</sub> ) | 3.5 | pF |
| $y_2$ to all other elements except $y_1$ | $C_{y_2(y_1)}$                    | 3.5 | pF |
| x <sub>1</sub> to x <sub>2</sub>         | $C_{x_1x_2}$                      | 3   | pF |
| y <sub>1</sub> to y <sub>2</sub>         | Cy1y2                             | 2   | pF |
| Control grid to all other elements       | Cg1                               | 6   | pF |
| Cathode to all other elements            | Ck                                | 5   | pF |

FOCUSING

electrostatic

| DEFLECTION | double electrostatic |
|------------|----------------------|
| x plates   | symmetrical          |
| y plates   | symmetrical          |

If use is made of the full deflection capabilities of the tube the deflection plates will intercept part of the electron beam; hence a low impedance deflection plate drive is desirable.

Angle between x and y traces  $90 \pm 1^{\circ}$ 

#### LINE WIDTH

Measured with the shrinking raster method in the centre of the screen under typical operating conditions, adjusted for optimum spot size at a beam current  $I_{\ell} = 10 \ \mu A^{-1}$ ).

### Line width

1.w. 0.35 mm

1) The beam current should be determined as follows:

| Accelerator voltage  | $V_{g2, g4, g5}(l)$                                   | 2000  | v   |
|--|---|-------|-----|
| Focusing electrode voltage                                 | Vg2   | adjus | ted |
| y plate voltage  | $v_{g_3} v_{y_1} = v_{y_2}$                           | 2000  | V   |
| x1 plate voltage   | V <sub>x1</sub> , , , , , , , , , , , , , , , , , , , | 1300  | v   |
| x <sub>2</sub> plate voltage                               | V <sub>x2</sub>                                       | 1700  | v   |
| Current, measured on x <sub>2</sub>                        | I <sub>X2</sub>                                       | 10    | μA  |
| Grid No.1 voltage (adjust for $I_{x_2} = 10 \mu\text{A}$ ) | 2   |       |     |

With the above  $V_{g_1}$ , adjusted  $V_{g_3}$ , and all other voltages according to the typical operating conditions, the beam current  $I_{\ell} = 10 \ \mu A$ .

7Z2 7550

### TYPICAL OPERATING CONDITIONS

| Accelerator voltage                  | $v_{g_2, g_4, g_5(\ell)}$     |         | 2000 | V                |
|--------------------------------------|-------------------------------|---------|------|------------------|
| Astigmatism control voltage          | $\Delta V_{g_2, g_4, g_5(l)}$ |         | ± 75 | V 1)             |
| Focusing electrode voltage           | v <sub>g3</sub>               | approx. | 300  | V                |
| Control grid voltage for visual      |                               |         |      |                  |
| extinction of focused spot           | vg1                           | approx. | -40  | V                |
| Deflection factor, horizontal        | M <sub>x</sub>                | approx. | 30   | V/cm             |
| vertical                             | My                            | approx. | 15   | V/cm             |
| Deviation of linearity of deflection |                               | max.    | 2    | % <sup>2</sup> ) |
| Useful scan, horizontal              |                               | min.    | 100  | mm               |
| vertical                             |                               | min.    | 80   | mm               |
|                                      |                               |         |      |                  |

### LIMITING VALUES

| A seclenator voltage           | V                      | max.    | 2200   | V                  |
|--------------------------------|------------------------|---------|--------|--------------------|
| Accelerator voltage            | $V_{g_2, g_4, g_5}(l)$ | min.    | 1500   | V                  |
| Focusing electrode voltage     | v <sub>g3</sub>        | max.    | 2200   | V                  |
|                                | V                      | max.    | 200    | V                  |
| Control grid voltage, negative | -v <sub>g1</sub>       | min.    | 0      | v                  |
| Cathode to heater voltage      | V <sub>kf</sub>        | cathode | connee | cted to            |
|                                |                        | heater  |        |                    |
| Grid drive, average            |                        | max.    | 20     | v                  |
| Screen dissipation             | Wl                     | max.    | 3      | mW/cm <sup>2</sup> |

The astigmatism control electrode voltage should be adjusted for optimum spot shape. For any necessary adjustment the control voltage will be within the stated range.

<sup>2)</sup> The sensitivity at a deflection of less than 75% of the useful scan will not differ from the sensitivity at a deflection of 25% of the useful scan by more than the indicated value.