DEVELOPMENT SAMPLE DATA

This information is derived from development samples made available for evaluation. It does not form part of our data handbook system and does not necessarily imply that the device will go into production

D14-260GH

INSTRUMENT CATHODE-RAY TUBE

not final   Sept 78

14 cm diagonal, rectangular flat faced oscilloscope tube with post-deflection acceleration mesh, primarily intended for use in compact oscilloscopes with 15 to 20 MHz bandwidth.

QUICK REFERENCE DATA

Final accelerator voltage	$V_{g7(\ell)}$		4 kV
Display area			100 x 80 mm²
Deflection coefficient			
horizontal	M_x	approx.	~~20~~ V/cm *19.5*
vertical	M_y	approx.	~~10~~ V/cm *10.5*

SCREEN

	colour	persistence
D14-260GH	green	medium short

Useful screen dimensions	$\geqslant$	100 x 80 mm²
Useful scan		
horizontal	$\geqslant$	100 mm
vertical	$\geqslant$	80 mm
Spot eccentricity in horizontal and vertical directions	$\leqslant$	6,5 mm

HEATING

Indirect by a.c. or d.c.; parallel supply

Heater voltage	V_f	6,3 V
Heater current	I_f	300 mA

MECHANICAL DATA

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.

Net mass   approx. 1050 g

Base   14 pin, all glass

final accelerator contact

blue binder, tab 4

(handwritten: $\ell roen = 9$, $\delta\ell = k$)

Dimensions and connections

See also outline drawing		
Overall length	$\leqslant$	333 mm
Face dimensions	$\leqslant$	100 x 120 mm^2

Accessories

Socket, supplied with tube	type 55566
Mu-metal shield	type 55591
Final accelerator contact connector	type 55569

FOCUSING

electrostatic

DEFLECTION

double electrostatic

x-plates	symmetrical
y-plates	symmetrical
Angle between x and y-traces	$90 \pm 1^{\text{o}}$
Angle between x-trace and horizontal axis of the face	$\leqslant$ 5° *

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

CAPACITANCES

x_1 to all other elements except x_2	$C_{x1(x2)}$	5,8 pF	*(handwritten: 7)*
x_2 to all other elements except x_1	$C_{x2(x1)}$	5,4 pF	*(handwritten: 6,5)*
y_1 to all other elements except y_2	$C_{y1(y2)}$	3,4 pF	*(handwritten: 4)*
y_2 to all other elements except y_1	$C_{y2(y1)}$	2,8 pF	*(handwritten: 3,5)*
x_1 to x_2	C_{x1x2}	2,1 pF	*(handwritten: 2,2)*
y_1 to y_2	C_{y1y2}	1,1 pF	
Control grid to all other elements	C_{g1}	6,1 pF	
Cathode to all other elements	C_k	5 pF	

(handwritten: max)

* The tube is provided with a rotation coil, concentrically wound around the tube neck, enabling the alignment of the x-trace with the mechanical x-axis of the screen. The coil has 1000 turns and a resistance of 400 Ω. Under typical operating conditions, max. 30 ampere-turns are required for the max. rotation of 5°. This means the required current is max. 30 mA at a required voltage of 12 V.
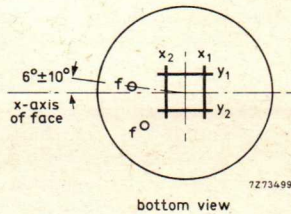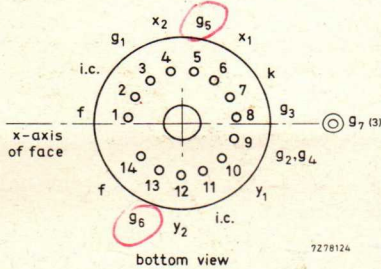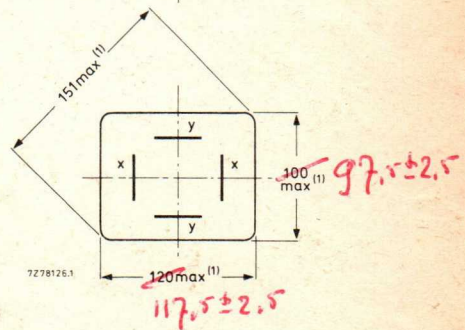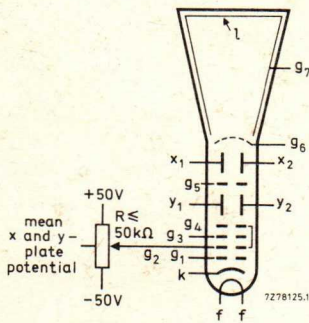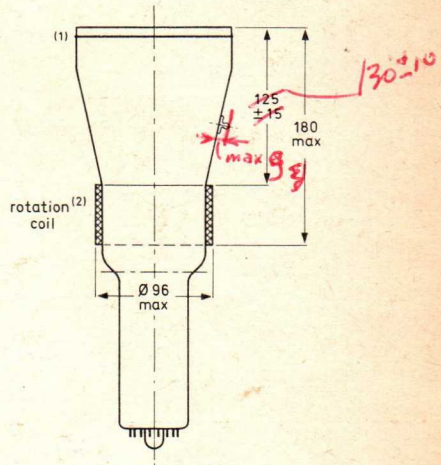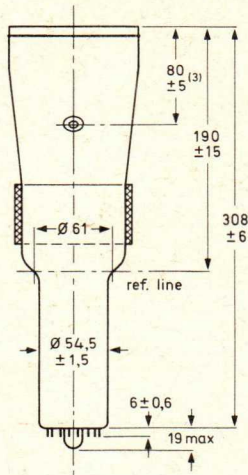
Notes to the drawings on opposite page.

1. The bulge at the frit seal may increase the indicated maximum dimensions by not more than 2 mm.

2. The coil is fixed to the envelope by means of adhesive tape.

3. The centre of the contact is situated within a square of 10 mm x 10 mm around the true geometrical position.

PHILIPS

DIMENSIONS AND CONNECTIONS

Dimensions in mm

For notes to the drawings see bottom of opposite page.

80 ±5 (3)

190 ±15

Ø 61

ref. line

308 ±6

Ø 54,5 ±1,5

6 ± 0,6

19 max

(1)

125 ±15

180 max

rotation (2) coil

Ø 96 max

$130^{\circ} \pm 10$

max g_5

151 max (1)

120 max (1)

100 max (1)

$97,5 \pm 2,5$

$117,5 \pm 2,5$

7Z78126.1

x y

g_7

g_6

x_1 x_2

g_5

y_1 y_2

g_4

g_3

g_2 g_1

k

f   f

+50V

R ≤ 50kΩ

mean x and y-plate potential

−50V

7Z78125.1

bottom view

g_1 x_2 g_5 x_1

i.c.

3 4 5 6

2   k

1   7

8   g_3

9

14 10 g_2,g_4

13 12 11 y_1

f

g_6 y_2 i.c.

g_7 (3)

7Z78124

bottom view

6°±10°

x-axis of face

x_2 x_1

f y_1

y_2

f

7Z73499

x-axis of face

plaats spoel in flozes

hoogte knopji

PHILIPS

January 1978   3

DEVELOPMENT SAMPLE DATA

TYPICAL OPERATION

Conditions

Final accelerator voltage	$V_{g7(\ell)}$	4 kV	
Post deflection accelerator mesh electrode voltage	V_{g6}	2000 V	
Interplate shield voltage	V_{g5}	2000 V	(note 1)
First accelerator voltage	$V_{g2, g4}$	2000 V	
Astigmatism control electrode voltage	$\Delta V_{g2, g4}$	± 50 V	(note 2)
Focusing electrode voltage	V_{g3}	300 to 480 V	
Control grid voltage for visual extinction of focused spot	V_{g1}	−30 to −70 V	

Performance

Useful scan horizontal		⩾ 100 mm	(note 3)
vertical		⩾ 80 mm	
Deflection coefficient horizontal	M_x	~~20~~ V/cm *[handwritten: 95 ... max 21,5]*	
vertical	M_y	~~10~~ V/cm *[handwritten: 10,5 ... 11,6]*	
Line width	l.w.	≈ ~~0,40~~ mm *[handwritten: 0,35]*	(note 4)
Deviation of linearity of deflection		⩽ 2 %	(note 5)
Grid drive for 10 μA screen current		≈ 20 V	
Geometry distortion	see note 6		

NOTES

1. The interplate shield voltage should be equal to the mean x-plate potential. The mean x-plate and y-plate potentials should be equal for optimum spot quality.
2. The astigmatism control electrode voltage should be adjusted for optimum spot shape. For any necessary adjustment its potential will be within the stated range.
3. The tube is designed for optimum performance when operating at a ratio $V_{g7(\ell)}/V_{g2, g4} = 2$. If this ratio is smaller than 2, the useful scan may be smaller than 100 mm x 80 mm.
4. Measured with the shrinking raster method in the centre of the screen with corrections adjusted for optimum spot size, at a beam current of 10 μA.
5. 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.
6. A graticule consisting of concentric rectangles of 95 mm x 75 mm and 93 mm x 73 mm is aligned with the electrical x-axis of the tube. With optimum corrections applied, the edges of a raster will fall between these rectangles.

PHILIPS

LIMITING VALUES (Absolute maximum rating system)

Final accelerator voltage	$V_{g7(\ell)}$	max.	4,4	kV
		min.	3	kV
Post deflection accelerator mesh electrode voltage	V_{g6}	max.	2200	V
Interplate shield voltage	V_{g5}	max.	2200	V
First accelerator and astigmatism control electrode voltage	$V_{g2, g4}$	max.	2200	V
		min.	1500	V
Focusing electrode voltage	V_{g3}	max.	2200	V
Control grid voltage	$-V_{g1}$	max.	200	V
		min.	0	V
Cathode to heater voltage				
positive	V_{kf}	max.	125	V
negative	$-V_{kf}$	max.	125	V
Grid drive, average		max.	20	V
Screen dissipation	W_{ℓ}	max.	3	mW/cm^2

260   1/0 × 50 = 20 cm².

$$4 \times 23V = \frac{92V}{19.5}$$

4.7 cm.
× .

$$\frac{4 \times 13.5}{10.5} = 5.14 \ cm.$$

24 cm².

4 × 23V