INSTRUMENT CATHODE-RAY TUBE

14 cm diagonal, rectangular flat faced, split-beam oscilloscope tube with mesh and metal-backed screen.

QUICK REFERENCE DATA			
Final accelerator voltage	$V_{g7(\ell)}$	10	kV
Display area		100 x 80	mm^2
Deflection coefficient, horizontal	M_x	13.5	V/cm
vertical	M_y'	9	V/cm
	M_y''	9	V/cm
Overlap of the systems		100	%

Blue Binder, Tab.4

SCREEN : Metal-backed phosphor

	Colour	Persistence
E14-100GH	green	medium short

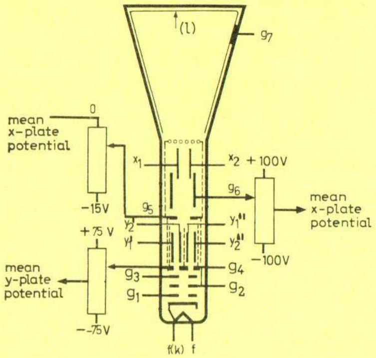
Useful screen dimensions	min.	100 x 80	mm^2
Useful scan at $V_{g7(\ell)}/V_{g2,g4} = 6.7$			
horizontal	min.	100	mm
vertical (each system)	min.	80	mm
overlap		100	%
Spot eccentricity in horizontal and vertical directions	max.	7	mm

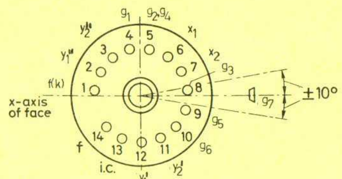
HEATING : indirect by A.C. or D.C. ; parallel supply

Heater voltage	V_f	6.3	V
Heater current	I_f	300	mA

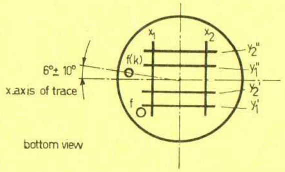
MECHANICAL DATA

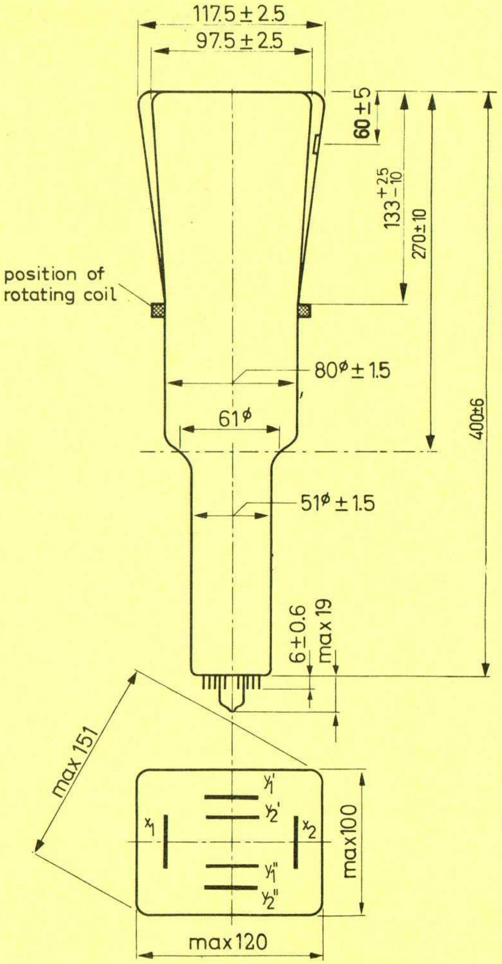
Dimensions in mm





bottom view





Front view

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.

MECHANICAL DATA (continued)

Dimensions and connections

See also outline drawing.

Overall length (socket included)	max.	425	mm
Face dimensions	max.	120 x 100	mm^2
Net weight	approx.	900	g
Base	14-pin all glass		

Accessories

Socket (supplied with tube)	type	55566
Final accelerator contact connector	type	55563

FOCUSING Electrostatic

DEFLECTION Double electrostatic

x-plates symmetrical

y-plates symmetrical

If the full deflection capacity of the tube is used, part of the beam is intercepted by the deflection plates; hence a low-impedance deflection plate drive is desirable.

Angle between x and y traces (each beam)		90 ± 1	°
Angle between corresponding y traces at screen centre	max.	45	'
Angle between x trace and horizontal axis of the face	max.	5	°

The x-trace can be aligned with the horizontal axis of the screen by rotating the entire image by means of a rotation coil. This coil will have less than 50 ampturns for the indicated max. rotation of 5° and should be positioned as indicated on the drawing.

LINE WIDTH

Measured with the shrinking raster method under typical operating conditions, and adjusted for optimum spot size at a beam current of 5 μA per system.

Line width at screen centre	l.w.	approx.	0.35	mm

CAPACITANCES

x_1 to all other elements except x_2	$C_{x1(x2)}$	8	pF
x_2 to all other elements except x_1	$C_{x2(x1)}$	8	pF
y_1' to all other elements except y_2'	$C_{y1'(y2')}$	5	pF
y_2' to all other elements except y_1'	$C_{y2'(y1')}$	6.5	pF
y_1'' to all other elements except y_2''	$C_{y1''(y2'')}$	6.5	pF
y_2'' to all other elements except y_1''	$C_{y2''(y1'')}$	5	pF

CAPACITANCES (continued)

x_1 to x_2	$C_{x_1x_2}$	3.5	pF
y_1' to y_2'	$C_{y_1'y_2'}$	1.5	pF
y_1'' to y_2''	$C_{y_1''y_2''}$	1.5	pF
y_1' to y_1''	$C_{y_1'y_1''}$	0.005	pF
y_2' to y_2''	$C_{y_2'y_2''}$	0.005	pF
y_1' to y_2''	$C_{y_1'y_2''}$	0.001	pF
y_2' to y_1''	$C_{y_2'y_1''}$	0.015	pF
Control grid to all other elements	C_{g_1}	7	pF
Cathode to all other elements	C_k	7	pF

NOTES

1) This tube is designed for optimum performance when operating at a ratio $V_{g7(\ell)}/V_{g2,g4} = 6.7$.
The geometry control voltage V_{g_6} should be adjusted within the indicated range (values with respect to the mean x-plate potential).

2) A negative control voltage on g_5 (with respect to the mean x-plate potential) will cause some pincushion distortion and less background light. By varying the two voltages V_{g_5} and V_{g_6} it is possible to find the best compromise between background light and raster distortion.

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

4) The sensitivity at a deflection 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.

5) A graticule, consisting of concentric rectangles of 100 mm x 80 mm and 96 mm x 77 mm is aligned with the electrical x-axis of the tube. With optimum correction potentials applied a raster of each system will fall between these rectangles.

TYPICAL OPERATING CONDITIONS

Final accelerator voltage	$V_{g_7(\ell)}$		10	kV	
Geometry control electrode voltage	V_{g_6}		1500 ± 100	V	1)
Interplate shield voltage	V_{g_5}		1500	V	
Background illumination control voltage	ΔV_{g_5}		0 to -15	V	2)
Focusing electrode voltage	V_{g_3}		350 to 650	V	
First accelerator voltage	V_{g_2,g_4}		1500	V	
Astigmatism control voltage	$\Delta V_{g_2,g_4}$		±75	V	3)
Control grid voltage for extinction of focused spot	V_{g_1}		-20 to -70	V	
Deflection coefficient, horizontal	M_x	approx.	13.5	V/cm	
vertical	$M_{y'}$	approx.	9	V/cm	
	$M_{y''}$	approx.	9	V/cm	
Deviation of deflection linearity		max.	2	%	4)
Geometry distortion		see note 5)			
Useful scan, horizontal		min.	100	mm	
vertical		min.	80	mm	
Overlap of the two systems, horizontal			100	%	
vertical			100	%	

LIMITING VALUES (Absolute max. rating system)

Final accelerator voltage	$V_{g_7(\ell)}$	max.	13	kV
		min.	9	kV
Geometry control electrode voltage	V_{g_6}	max.	2200	V
Interplate shield voltage	V_{g_5}	max.	2200	V
Focusing electrode voltage	V_{g_3}	max.	2200	V
First accelerator and astigmatism control electrode voltage	V_{g_2,g_4}	max.	2200	V
		min.	1350	V
Control grid voltage	$-V_{g_1}$	max.	200	V
		min.	0	V
Voltage between astigmatism control electrode and any deflection plate	$V_{g4/x}$	max.	500	V
	$V_{g4/y}$	max.	500	V
Grid drive, average		max.	30	V
Screen dissipation	W_ℓ	max.	3	mW/cm^2
Ratio $V_{g7(\ell)}/V_{g2,g4}$	$V_{g_7(\ell)}/V_{g_2,g_4}$	max.	6.7	

Notes see page 4