INSTRUMENT CATHODE-RAY TUBE

18 cm diagonal, rectangular flat faced oscilloscope tube with mesh and metal backed screen.

QUICK REFERENCE DATA

Final accelerator voltage	$V_{g7(\ell)}$	10 kV
Display area		120 x 100 mm²
Deflection factor		
horizontal	M_x	15,5 V/cm
vertical	M_y	4,5 V/cm

SCREEN

Metal backed phosphor		
type	D18-120GH	
colour	green	
persistence	medium short	
Useful screen area	min.	120 x 100 mm²
Useful scan at $V_{g7(\ell)}/V_{g2,g4} = 5$		
horizontal	min.	120 mm
vertical	min.	100 mm
Spot eccentricity		
horizontal direction		± 8 mm
vertical direction		± 6 mm

HEATING

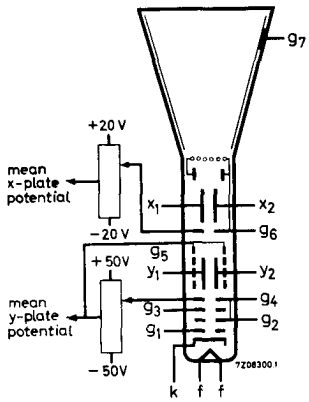
Indirect by AC or DC; parallel supply

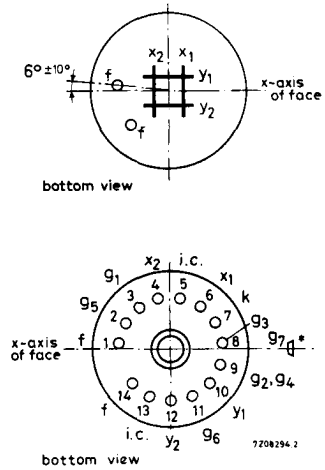
Heater voltage	V_f	6,3 V
Heater current	I_f	300 mA

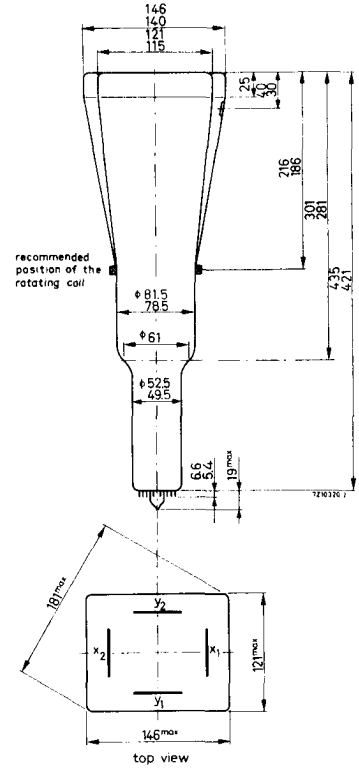
MECHANICAL DATA

Dimensions in mm

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







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 (socket included)	max. 454 mm
Face dimensions	max. 146 x 121 mm^2
Net weight	approx. 1300 g
Base	14 pin all glass
Accessories	
Socket (supplied with tube)	type 55566
Final accelerator contact connector	type 55563A
Mu-metal shield	type 55584

CAPACITANCES

x_1 to all other elements except x_2	$C_{x1(x2)}$	6,5 pF
x_2 to all other elements except x_1	$C_{x2(x1)}$	6,5 pF
y_1 to all other elements except y_2	$C_{y1(y2)}$	5 pF
y_2 to all other elements except y_1	$C_{y2(y1)}$	5 pF
x_1 to x_2	C_{x1x2}	2,2 pF
y_1 to y_2	C_{y1y2}	1,7 pF
Control grid to all other elements	C_{g1}	5,5 pF
Cathode to all other elements	C_k	4,5 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 ± 1°
Angle between x trace and the horizontal axis of the face	max. 5° note 1

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 $I_{\ell} = 10\ \mu A$.

Line width

at screen centre	l.w.		0,50 mm
in corner area	l.w.	approx.	0,60 mm

1. See last page.

TYPICAL OPERATING CONDITIONS

					notes
Final accelerator voltage	$V_{g7(\ell)}$		10000	V	
Interplate shield voltage	V_{g6}		2000	V	
Geometry control voltage	ΔV_{g6}		± 20	V	2
Deflection plate shield voltage	V_{g5}		2000	V	3
Focusing electrode voltage	V_{g3}		350 to 500	V	
First accelerator voltage	$V_{g2,g4}$		2000	V	
Astigmatism control voltage	$\Delta V_{g2,g4}$		± 50	V	4
Control grid voltage for visual extinction of focused spot	V_{g1}		−25 to −80	V	
Grid drive for 10 μA screen current		approx.	12	V	
Deflection factor, horizontal	M_x	av.	15,5	V/cm	
		max.	17	V/cm	
Deflection factor, vertical	M_y	av.	4,5	V/cm	
		max.	5	V/cm	
Deviation of linearity of deflection		max.	2	%	5
Geometry distortion	See note 6				
Useful scan					
horizontal		min.	120	mm	
vertical		min.	100	mm	

LIMITING VALUES

Absolute maximum rating system

Final accelerator voltage	$V_{g7(\ell)}$	max.	11000	V
		min.	9000	V
Interplate shield voltage and geometry control electrode voltage	V_{g6}	max.	2200	V
Deflection plate shield voltage	V_{g5}	max.	2200	V
Focusing electrode voltage	V_{g3}	max.	2200	V
First accelerator and astigmatism control electrode voltage	$V_{g2,g4}$	max.	2200	V
		min.	1350	V
Control grid voltage	$-V_{g1}$	max.	200	V
		min.	0	V
Cathode to heater voltage	V_{kf}	max.	125	V
	$-V_{kf}$	min.	125	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.	20	V
Screen dissipation	W_ℓ	max.	8	mW/cm²
Ratio $V_{g7(\ell)}/V_{g2,g4}$	$V_{g7(\ell)}/V_{g2,g4}$	max.	6,7	
Control grid circuit resistance	R_{g1}	max.	1	MΩ

NOTES

1. In order to align the x-trace with the horizontal axis of the screen, the whole picture can be rotated by means of a rotation coil. This coil will have 50 amp. turns for the indicated maximum rotation of 5° and should be positioned as indicated in the drawing.
2. This tube is designed for optimum performance when operating at a ratio $V_{g7}/V_{g2,g4} = 5$.
   The geometry electrode voltage should be adjusted within the indicated range (values with respect to the mean x-plate potential).
   A negative control voltage will cause some pincushion distortion and less background light, a positive control voltage will give some barrel distortion and a slight increase of background light.
3. The deflection plate shield voltage should be equal to the mean y-plate potential. The mean x- and y-plate potentials should be equal for optimum spot quality.
4. The astigmatism control electrode voltage should be adjusted for optimum spot shape. For any necessary adjustment its potential will be within the stated range.
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 115 mm x 95 mm and 112,2 mm x 93,0 mm is aligned with the electrical x-axis of the tube, with optimum correction potentials applied, a raster will fall between these rectangles.