INSTRUMENT CATHODE-RAY TUBE

14 cm diagonal, rectangular flat-faced oscilloscope tube with mesh and metal backed screen. The tube has side connections to the x- and y-plates, and is intended for use in transistorized oscilloscopes up to a frequency of 50 MHz.

QUICK REFERENCE DATA			
Final accelerator voltage	$V_{g8(\ell)}$	10	kV
Display area		100 x 80	mm^2
Deflection coefficient, horizontal	M_x	15,5	V/cm
vertical	M_y	4,2	V/cm

SCREEN : Metal backed phosphor

	Colour	Persistence
D14-121GH	green	medium short

Useful screen area	>	100 x 80	mm^2
Useful scan at $V_{g8(\ell)}/V_{g2,g4}$ = 6,7, horizontal	>	100	mm
vertical	>	80	mm
Spot eccentricity in horizontal and vertical directions	<	6	mm

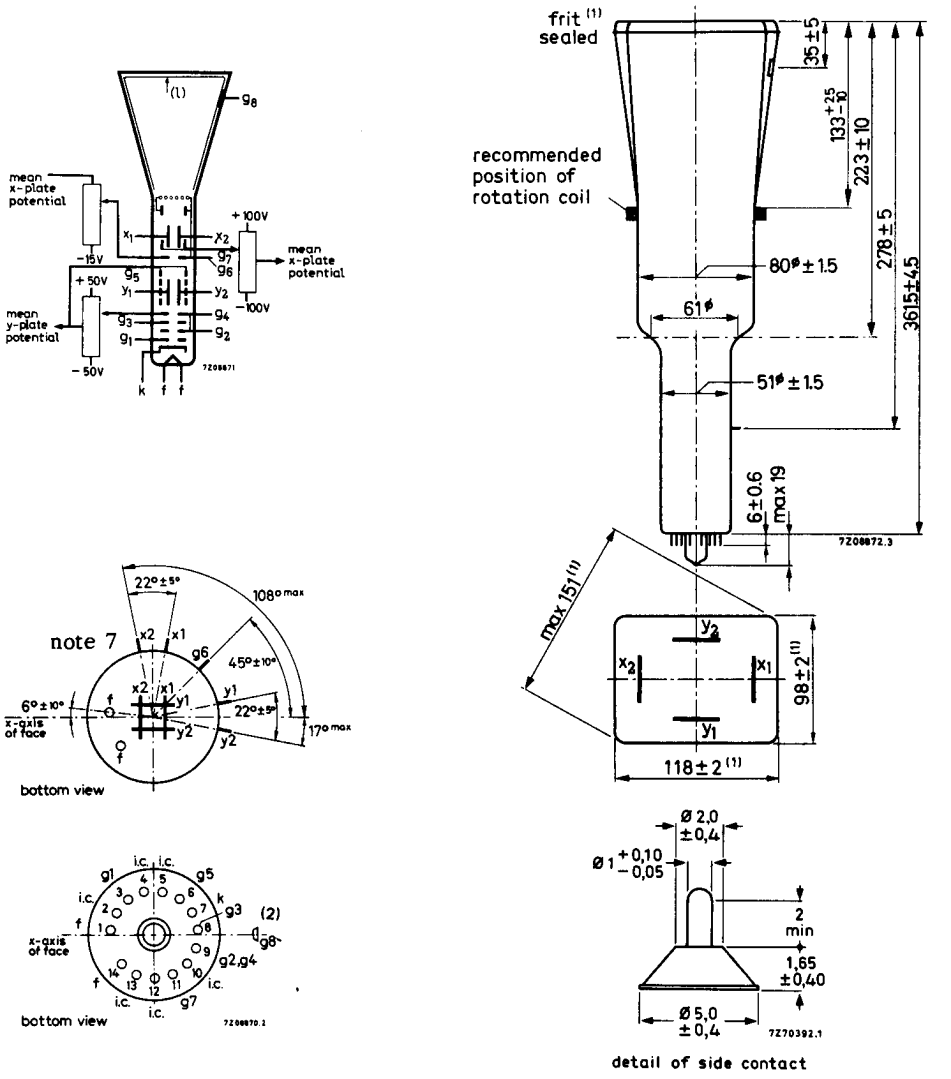
HEATING

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



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

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

Fig. 1 Outlines.

Mounting position

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)	<	385	mm
Face dimensions	< 100 x	120	mm
Net mass	approx.	900	g
Base	14-pin all glass		
Accessories			
Socket (supplied with tube)	type	55566	
Final accelerator contact connector	type	55563A	
Mu-metal shield	type	55581A	

CAPACITANCES

x_1 to all other elements except x_2	$C_{x1(x2)}$	5,5	pF
x_2 to all other elements except x_1	$C_{x2(x1)}$	5,5	pF
y_1 to all other elements except y_2	$C_{y1(y2)}$	4	pF
y_2 to all other elements except y_1	$C_{y2(y1)}$	4	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^o	
Anglr between x trace and the horizontal axis of the face	$< 5^o$	see note 1

LINE WIDTH

Measured with the shrinking raster method under typical operating conditions, adjusted for optimum spot size at a beam current I_ℓ = 10 µA.

Line width at screen centre	l.w.	0,40	mm
over the whole screen area	l.w. av. <	0,45	mm

TYPICAL OPERATING CONDITIONS

Final accelerator voltage	$V_{g_8(\ell)}$		10	kV
Geometry-control electrode voltage	V_{g_7}		1500 ± 100	V see note 2
Post deflection and interplate shield voltage	V_{g_6}		1500	V
Background illumination control voltage	ΔV_{g_6}		0 to -15	V see note 2
Deflection plate shield voltage	V_{g_5}		1500	V see note 3
Focusing electrode voltage	V_{g_3}		250 to 350	V
First accelerator voltage	V_{g_2,g_4}		1500	V
Astigmatism control voltage	$\Delta V_{g_2,g_4}$		±50	V see note 4
Control grid voltage for extinction of focused spot	V_{g_1}		-20 to -60	V
Grid drive for 10 μA screen current		approx.	12	V
Deflection coefficient, horizontal	M_x	av.	15,5	V/cm
		<	16	V/cm
vertical	M_y	av.	4,2	V/cm
		<	4,6	V/cm
Deviation of linearity of deflection		<	2	% see note 5
Geometry distortion			See note 6	
Useful scan, horizontal		>	100	mm
vertical		>	80	mm

LIMITING VALUES (Absolute max. rating system)

Final accelerator voltage	$V_{g_8(\ell)}$	max.	11	kV
		min.	9	kV
Post deflection and interplate shield voltage and geometry control electrode voltage	V_{g_7}, V_{g_6}	max.	2200	V
Deflection plate 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
Cathode to heater voltage	V_{kf}	max.	125	V
	$-V_{kf}$	max.	125	V
Voltage between astigmatism control electrode and any deflection plate	$V_{g_4/x}$	max.	500	V
	$V_{g_4/y}$	max.	500	V
Grid drive, average		max.	20	V
Screen dissipation	W_ℓ	max.	8	mW/cm^2
Ratio $V_{g_8(\ell)}/V_{g_2,g_4}$	$V_{g_8(\ell)}/V_{g_2,g_4}$	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 max. rotation of 5^{o} and should be positioned as indicated on the drawing.

2. This tube is designed for optimum performance when operating at a ratio $V_{g8(\ell)} / V_{g2,g4} = 6,7$
   The geometry control voltage V_{g7} should be adjusted within the indicated range (values with respect to the mean x-plate potential).
   A negative control voltage on g_6 (with respect to the mean x-plate potential) will cause some pincushion distortion and less background light.
   By the use of the two voltages, V_{g6} and V_{g7}, it is possible to find the best compromise between background light and raster distortion.

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 95 mm x 75 mm and 93 mm x 73,6 mm is aligned with the electrical x axis of the tube. With optimum correction potentials applied a raster will fall between these rectangles.

7. To avoid damage to the side contacts the narrower end of the Mu-metal shield should have an internal diameter of not less than 64 mm.