

INSTRUMENT CATHODE-RAY TUBE

10 cm diameter metal-backed flat-faced double gun oscilloscope tube with post-deflection acceleration by means of a helical electrode and low interaction between beams.

QUICK REFERENCE DATA

Final accelerator voltage	$V_{g8}(\ell)$	4000 V
Display area	horizontal	full scan
	vertical	7 cm
Deflection factor, horizontal	M_x	17 V/cm
	vertical	M_y

SCREEN

	Colour	Persistence
E10-130BE	blue	medium short
E10-130GH	green	medium short
E10-130GM	yellowish green	long
E10-130GP	bluish green	medium short

Useful screen diameter min. 85 mm

Useful scan (each gun) at $V_{g8}(\ell)/V_{g5} = 4$

	horizontal	full scan
	vertical	min. 70 mm

The useful scan may be shifted vertically to a maximum of 5 mm with respect to the geometric centre of the face plate.

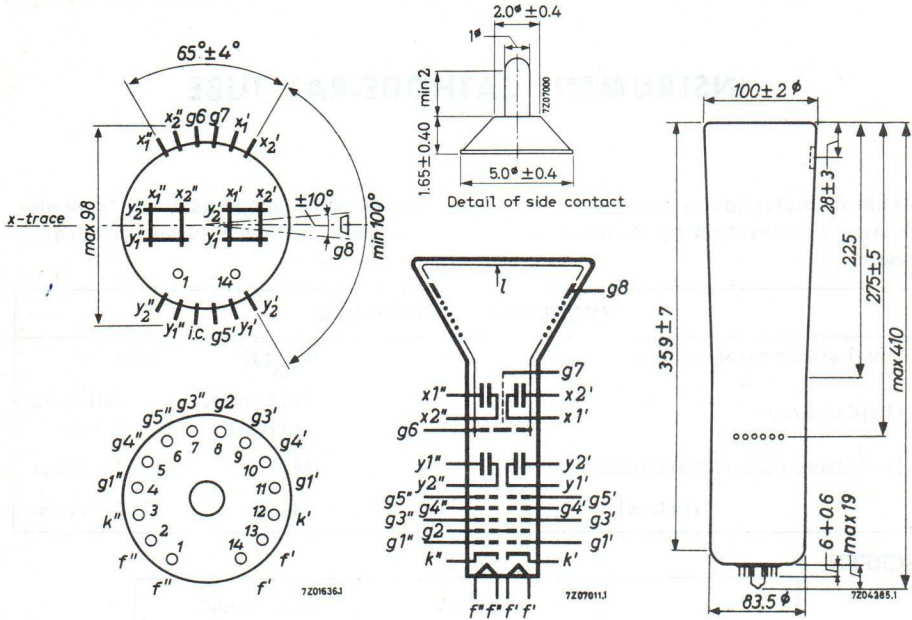
HEATING

Indirect by A.C. or D.C.; parallel supply

Heater voltage	V_f	6.3 V
Heater current	I_f	300 mA

Blue binder Cathode-ray tubes

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.

Base

14 pin, all glass

Dimensions and connections

Overall length

max. 410 mm

Face diameter

max. 102 mm

Net weight

approx. 800 g

Accessories

Socket, supplied with tube

type 55566

Final-accelerator contact connector

type 55563

Side contact connector

type 55561

Mu-metal shield

type 55545

CAPACITANCES

x_1' to all other elements except x_2'	$C_{x_1'}(x_2')$	4.5 pF
x_2' to all other elements except x_1'	$C_{x_2'}(x_1')$	3 pF
x_1'' to all other elements except x_2''	$C_{x_1''}(x_2'')$	3 pF
x_2'' to all other elements except x_1''	$C_{x_2''}(x_1'')$	4.5 pF
y_1 to all other elements except y_2	$C_{y_1}(y_2)$	2 pF
y_2 to all other elements except y_1	$C_{y_2}(y_1)$	2 pF
x_1 to x_2	$C_{x_1x_2}$	2 pF
y_1 to y_2	$C_{y_1y_2}$	1.5 pF
Grid No. 1 to all other elements	C_{g_1}	5.2 pF
Cathode to all other elements	C_k	5 pF

FOCUSING Electrostatic**DEFLECTION** Double electrostatic

x plates symmetrical

y plates symmetrical

Angle between x and y traces (each gun) $90 \pm 1^\circ$ Angle between corresponding x traces
at the centre of the screen max. 0.6° Angle between corresponding y traces
at the centre of the screen max. 1°

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.

LINE WIDTH

Measured with the shrinking-raster method in the centre of the screen.

Final accelerator voltage	$V_{g_8}(\ell)$	4000 V
Astigmatism-control electrode voltage	V_{g_5}	1000 V ²⁾
First accelerator voltage	V_{g_2}	1000 V
Beam current	$I_{g_8}(\ell)$	10 μ A
Line width	l.w.	0.4 mm

HELIXPost-deflection accelerator helix resistance min. 100 $M\Omega$ ²⁾ See page 5

TYPICAL OPERATING CONDITIONS (each gun, if applicable)

Final accelerator voltage	$V_{g8}(\ell)$	4000	V	
Intergun shield voltage	V_{g7}	1000 \pm 100	V	1)
Geometry-control electrode voltage	V_{g6}	1000 \pm 100	V	1)
Astigmatism-control electrode voltage	V_{g5}	1000 \pm 100	V	2)
Focusing electrode voltage	V_{g4}	200 to 320	V	
Deflection-blanking electrode voltage	V_{g3}	1000	V	
Deflection-blanking control voltage for blanking a beam current $I_{g8}(\ell) = 10 \mu\text{A} \Delta V_{g3}$	V_{g3}	max. 40	V	
First accelerator voltage	V_{g2}	1000	V	
Control grid voltage for extinction of focused spot	V_{g1}	-25 to -90	V	
Deflection factor, horizontal	M_x	14 to 20	V/cm	
vertical	M_y	6.4 to 8.4	V/cm	
Deviation of linearity of deflection		max. 2	%	3)
Geometry distortion		see note 4		
Interaction factor		max. $2 \cdot 10^{-3}$	mm/ V_{DC}	5)
Tracking error		1.2	mm	6)

LIMITING VALUES (each gun, if applicable) (Absolute max. rating system)

Final accelerator voltage	$V_{g8}(\ell)$	max. 5000	V
		min. 2700	V
Intergun shield voltage	V_{g7}	max. 1200	V
Geometry control electrode voltage	V_{g6}	max. 1200	V
Astigmatism control electrode voltage	V_{g5}	max. 1200	V
		min. 800	V
Focusing electrode voltage	V_{g4}	max. 1200	V
Beam blanking electrode voltage	V_{g3}	max. 1200	V
First accelerator voltage	V_{g2}	max. 1200	V
		min. 200	V
Control grid voltage, negative	$-V_{g1}$	max. 200	V
positive	V_{g1}	max. 0	V
Cathode to heater voltage, cathode positive	V_{kf}	max. 125	V
cathode negative	$-V_{kf}$	max. 125	V
Average cathode current	I_k	max. 300	μA
Screen dissipation	W_ℓ	max. 3	mW/cm ²
Ratio $V_{g8}(\ell)/V_{g5}$	$V_{g8}(\ell)/V_{g5}$	max. 4	

1) 2) 3) 4) 5) 6) See page 5

CIRCUIT DESIGN VALUES (each gun, if applicable)

Focusing voltage	V_{g4}	200 to 320 V	per kV of V_{g2}
Control grid voltage for extinction of focused spot	V_{g1}	-25 to -90 V	per kV of V_{g2}
Deflection factor at $V_{g8}(\ell)/V_{g5} = 4$			
horizontal	M_x	14 to 20 V/cm	per kV of V_{g5}
vertical	M_y	6.4 to 8.4 V/cm	per kV of V_{g5}
Focusing electrode current	I_{g4}	-15 to +10 μ A	
Control grid circuit resistance	R_{g1}	max. 1.5 M Ω	

- 1) This tube is designed for optimum performance when operating at the ratio $V_{g8}(\ell)/V_{g5} = 4$. Operation at higher ratio may result in changes in deflection uniformity and geometry distortion. The geometry control electrode voltage and the intergun shield voltage should be adjusted for optimum performance. For any necessary adjustment its potential will be within the stated range.
- 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 sensitivity at a deflection of $\leq 75\%$ 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.
- 4) A graticule consisting of concentric rectangles of 60 mm x 60 mm and 57.5 mm x 57.5 mm is aligned with the electrical x axis of the tube. The edges of a raster will fall between these rectangles with optimum potentials applied.
- 5) The deflection of one beam when balanced DC voltages are applied to the deflection plates of the other beam, will not be greater than the indicated value.
- 6) With 50 mm vertical traces superimposed at the tube face centre and deflected horizontally ± 4 cm by voltages proportional to the relative deflection factors, horizontal separation of the corresponding points of the traces will not be greater than the indicated value.