INSTUMENT 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	%

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 direction	max.	7	mm
in vertical direction	max.	10	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

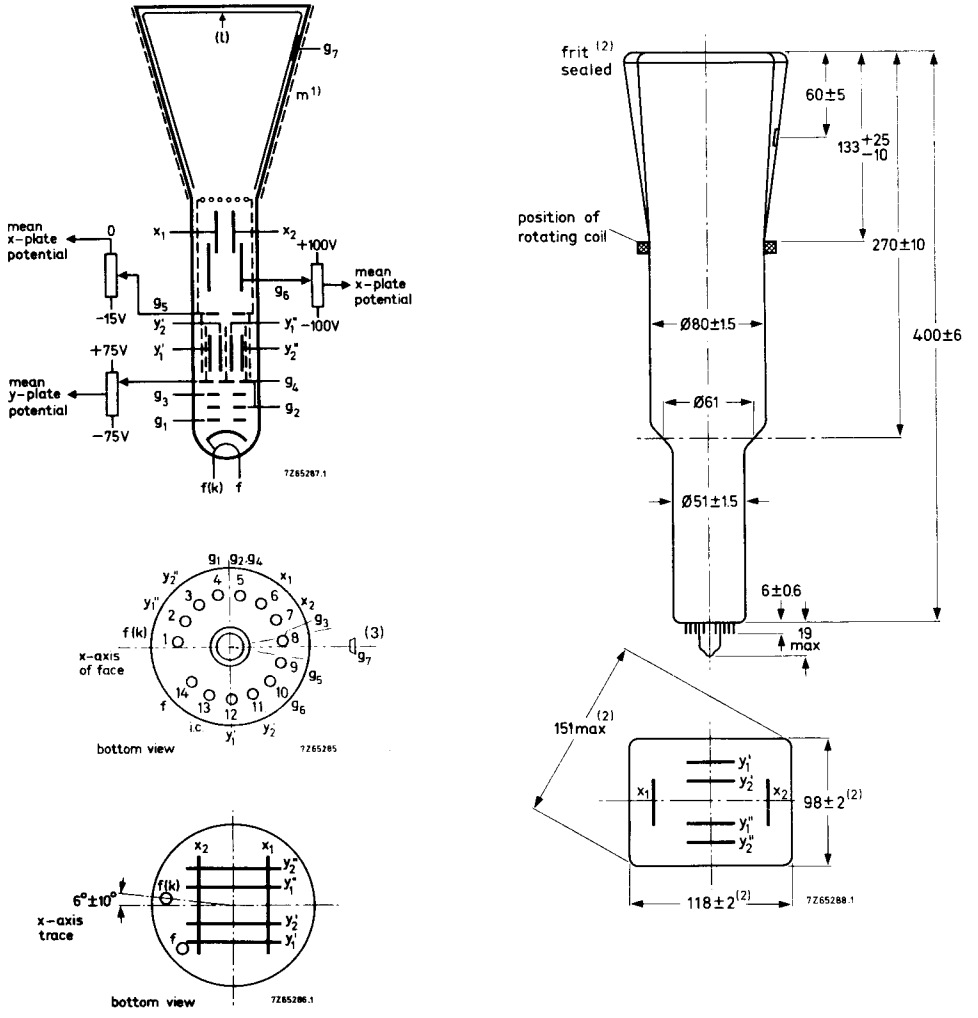

Fig. 1 Outlines.

(1) The external conductive coating should be earthed.
(2) The bulge at the frit seal may increase the indicated maximum dimensions by not more than 2 mm.
(3) The centre of the contact is located within a square of 10 mm x 10 mm around the true geometrical position.

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.

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	55563A

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.	0	°

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	$C_{x_1(x_2)}$	8	pF
x_2 to all other elements except x_1	$C_{x_2(x_1)}$	8	pF
y_1' to all other elements except y_2'	$C_{y_1'(y_2')}$	4	pF
y_2' to all other elements except y_1'	$C_{y_2'(y_1')}$	5,5	pF
y_1'' to all other elements except y_2''	$C_{y_1''(y_2'')}$	5	pF
y_2'' to all other elements except y_1''	$C_{y_2''(y_1'')}$	4	pF
External conductive coating to all other elements	C_m	800	pF

CAPACITANCES (continued)

x_1 to x_2	$C_{x_1x_2}$	3 pF
y_1' to y_2'	$C_{y_1'y_2'}$	1 pF
y_1'' to y_2''	$C_{y_1''y_2''}$	1 pF
Control grid to all other elements	C_{g_1}	6 pF
Cathode and heater to all other elements	$C_{kf/R}$	3 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_{g6} 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_{g5} and V_{g6} 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	$V_{g7(\ell)}$	10	kV	
Geometry control electrode voltage	V_{g6}	1500 ± 100	V	see note 1
Interplate shield voltage	V_{g5}	1500	V	
Background illumination control voltage	ΔV_{g5}	0 to −15	V	see note 2
Focusing electrode voltage	V_{g3}	350 to 650	V	
First accelerator voltage	$V_{g2,\ g4}$	1500	V	
Astigmatism control voltage	$\Delta V_{g2,\ g4}$	±75	V	see note 3
Control grid voltage for extinction of focused spot	V_{g1}	−20 to −70	V	
Deflection coefficient, horizontal	M_x	12,5 < 14	V/cm V/cm	
vertical	M_y'	9 < 10	V/cm V/cm	
	M_y''	9 < 10	V/cm V/cm	
Deviation of deflection linearity		< 2	%	see note 4
Geometry distortion				see note 5
Useful scan, horizontal		> 100	mm	
vertical		> 80	mm	
Overlap of the two systems, horizontal		100	%	
vertical		100	%	

LIMITING VALUES (Absolute max. rating system)

Final accelerator voltage	$V_{g7(\ell)}$	max. min.	12 9	kV kV
Geometry control electrode voltage	V_{g6}	max.	2200	V
Interplate 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. min.	2200 1350	V V
Control grid voltage	$-V_{g1}$	max. min.	200 0	V V
Voltage between astigmatism control electrode and any deflection plate	V_{g4}/x V_{g4}/y	max. max.	500 500	V V
Grid drive average		max.	30	V
Screen dissipation	W_ℓ	max.	8	mW/cm^2
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

CORRECTION COILS

General

The E14-100GH is provided with a pair of coils for image rotation which enable the alignment of the x-trace with the x-lines of the graticule.

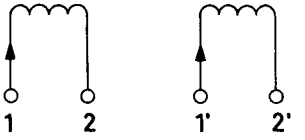

Fig. 2 Diagram of coil unit.

The image rotating coils are wound concentrically around the tube neck. Under typical operating conditions 50 A turns are required for the maximum rotation of 5°. Both coils have 850 turns. This means that a current of max. 30 mA per coil is required which can be obtained by using a 24 V supply when the coils are connected in series, or a 12 V supply when they are in parallel.

Connecting the coils

The coils have been connected to the 4 soldering tags as follows:

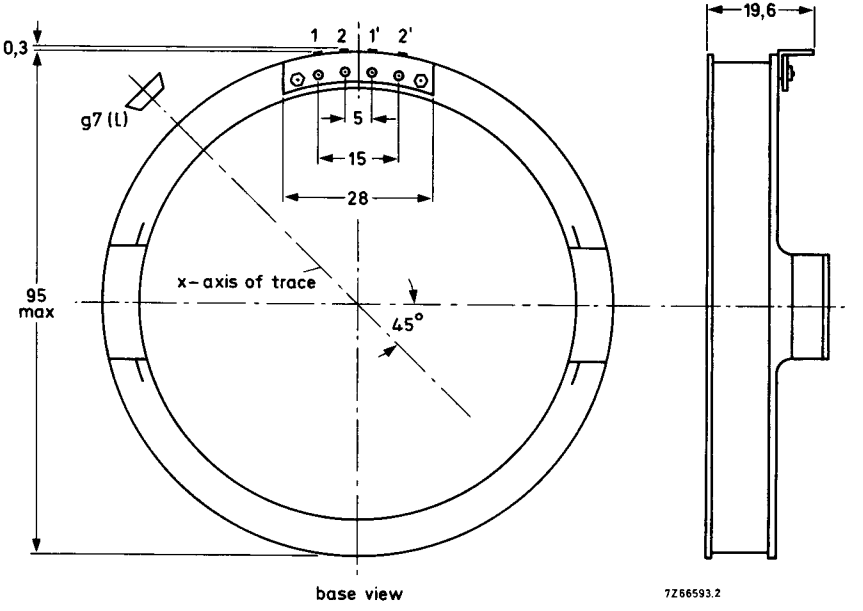

Fig. 3 Dimensions and connections.

BEAM CENTRING MAGNET

Inherent to the split-beam system a slight difference between the two beam currents can occur after splitting, resulting in different intensities of the two traces. In order to equalize the beam currents, a beam centring magnet should be mounted near the base of the gun and adjusted for the required field direction and field strength.

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The E14-101GH is equivalent to the E14-100GH but has no rotating coil.