

110° RECTANGULAR TELEVISION PICTURE TUBE

Rectangular television picture tube for direct viewing with bounded safety plate, metal backed screen, no ion trap, electrostatic focusing and 110° magnetic deflection; neck length 110 mm.

HEATING: Indirect by A.C. or D.C.; series or parallel supply

Heater voltage $V_f = 6.3 \text{ V}$

Heater current $I_f = 0.3 \text{ A}$

In case of series supply the surge heater voltage should not exceed 9.5 V (R.M.S.) when the supply is switched on. A current limiting device may be necessary to ensure that this voltage is not exceeded.

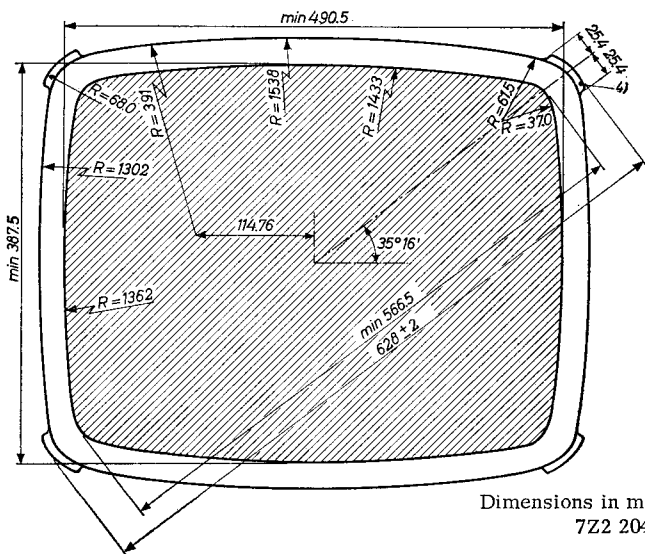
CAPACITANCES

Grid No.1 to all other electrodes	C_{g1}	=	6 pF
Cathode to all other electrodes	C_k	=	4 pF
External conductive coating to final accelerating electrode	$C_{m-a, g3, g5}$	= min. 1700 pF = max. 2500 pF	

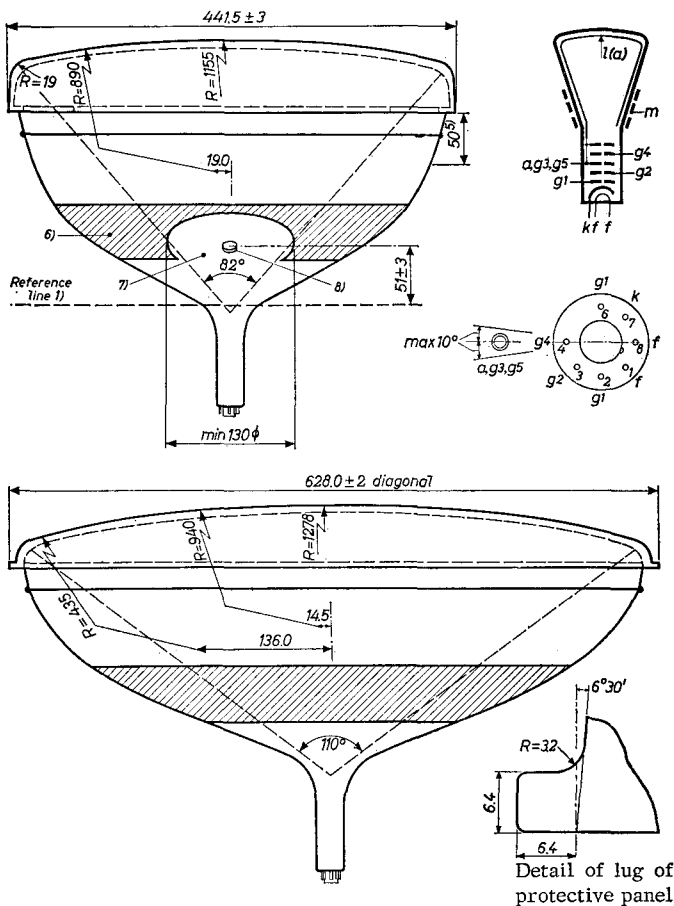
SCREEN

Metal backed	
Luminescence	white
Light transmission	50%
Useful diagonal	min. 566.5 mm
Useful width	min. 490.5 mm
Useful height	min. 387.5 mm

7Z2 2048



Dimensions in mm
7Z2 2049



Dimensions in mm

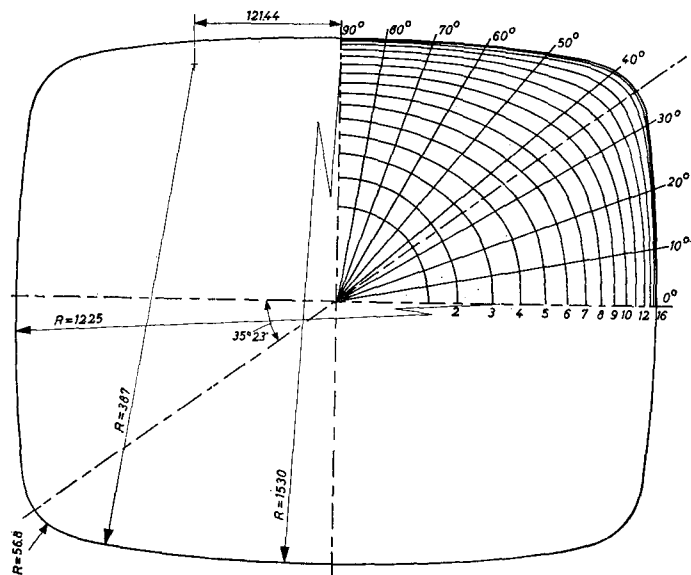
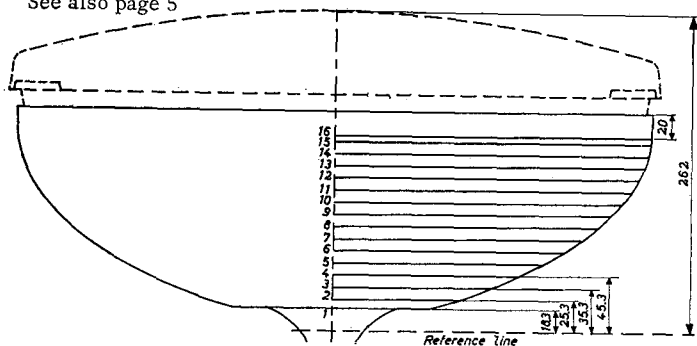
1) --- 8) See page 7

Base : Neo Eightar

Net weight 16 kg
7Z2 2052

MAXIMUM CONE CONTOUR DRAWING (dimensions in mm)

See also page 5



7Z2 2053

MAXIMUM CONE CONTOUR DRAWING (continued)

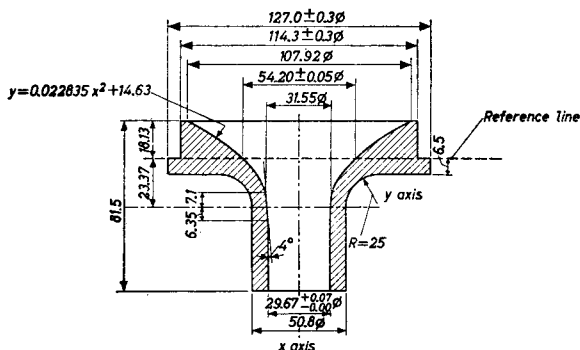
All dimensions (in mm) are maximum values, unless otherwise specified

Section	Nom. height above ref. line	Long axis 0°	10°	20°	30°	Dia- gonal 35° 23'	40°	50°	60°	70°	80°	Short axis 90°
1	18.3	77.5	77.5	77.5	77.5	77.5	77.5	77.5	77.5	77.5	77.5	77.5
2	25.3	101.2	101.2	101.2	101.2	101.2	101.2	101.2	101.2	101.2	101.2	101.2
3	35.3	130.4	131.0	131.1	129.6	127.9	126.3	123.5	121.8	121.1	120.7	121.1
4	45.3	154.5	155.0	155.8	152.0	149.1	146.6	142.1	138.6	136.8	136.4	136.8
5	55.3	175.0	175.7	176.1	172.9	168.8	165.6	159.3	154.2	151.0	149.7	149.8
6	65.3	192.7	193.7	194.3	191.9	187.2	183.1	175.4	168.7	164.4	161.5	161.0
7	75.3	207.9	209.4	210.9	209.0	204.1	199.3	190.2	181.8	176.2	171.9	170.5
8	85.3	221.0	222.8	225.4	224.6	220.3	215.0	203.9	193.8	186.5	181.2	178.8
9	95.3	231.8	233.8	238.1	238.2	235.7	230.3	216.5	204.4	195.7	189.5	186.9
10	105.3	241.5	243.6	248.7	252.6	250.3	244.7	228.3	214.4	203.7	196.8	194.1
11	115.3	249.6	252.0	258.5	264.4	263.9	258.2	239.1	223.2	211.0	203.3	200.9
12	125.3	255.9	258.7	266.2	274.8	276.3	271.0	249.0	230.5	217.1	208.8	205.5
13	135.3	260.7	263.7	272.3	284.4	287.6	282.8	257.7	236.3	221.7	213.2	210.7
14	145.3	264.0	267.1	276.6	292.0	297.2	292.7	264.4	240.3	224.8	216.3	213.7
15	155.3	265.9	269.1	279.0	296.2	302.3	297.7	267.7	242.8	226.7	218.0	215.2
16	160.5	266.25	269.45	279.37	297.01	303.00	298.64	268.44	243.25	227.23	218.35	215.50

7Z2 2054

REFERENCE LINE GAUGE

Dimensions in mm



If x and y are expressed in inches, the parabolic formula for the inner contour reads $y = 0.58x^2 + 0.576$

The reference line is determined by the plane of the upper edge of the flange of the reference line gauge when the gauge is resting on the cone.

FOCUSING electrostatic

DEFLECTION magnetic

Diagonal deflection angle 110°

Horizontal deflection angle 99°

Vertical deflection angle 82°

PICTURE CENTRING MAGNET

Field intensity perpendicular to the axis for centring of the picture should be adjustable from 0 to 10 Oersteds.

Distance between centre of the field of the magnet and the reference line max. 57 mm.

The centring magnet should be mounted as close to the deflection coils as possible.

7Z2 2142

Mounting position: any

The socket for the base should not be rigidly mounted, it should have flexible leads and be allowed to move freely. The bottom circumference of the base wafer will lie within a circle concentric with the bulb axis and having a diameter of 40 mm.

Notes from pages 2 and 3

- 1) Reference line. See page 6.
- 2) The centre of the panel may be eccentric with respect to the tube axis. The shift of the protective panel along its minor and major axes may be max. 1.5 mm.
- 3) Maximum contour given by reference line gauge.
- 4) The four lugs of the protective panel may be used for mounting the tube. However, the restrictions made under note ⁵⁾ should be observed.
- 5) Care should be taken that no mounting parts are in direct contact with the tube envelope unless the support is spaced from the envelope by cushioning parts.
No excessive pressure should be exerted by the support band on the splice line seal.
- 6) The configuration of the outer coating is optional, but contains the contact area as shown in the drawing. The external coating must be earthed.
- 7) This area must be kept clean.
- 8) Recessed cavity contact.

7Z2 2285

GRID DRIVE SERVICE

Voltages are specified with respect to the cathode.

OPERATING CHARACTERISTICS

Final accelerator voltage	V_{a, g_3, g_5}	=	18	18 kV
Grid No.2 voltage	V_{g_2}	=	400	500 V
Grid No.4 voltage	V_{g_4}	=	0 to 400	0 to 400 V ¹⁾
Negative grid No.1 voltage for visual extinction of focused raster	$-V_{g_1}$	=	40 to 77	50 to 93 V

LIMITING VALUES (Design centre limits)

Final accelerator voltage at $I_{a, g_3, g_5} = 0 \mu A$	V_{a, g_3, g_5}	=	max.	18 kV
Final accelerator voltage	V_{a, g_3, g_5}	=	min.	11 kV ²⁾
Grid No.4 voltage				
positive value	V_{g_4}	=	max.	1000 V
negative value	$-V_{g_4}$	=	max.	500 V
peak positive value	$V_{g_4 p}$	=	max.	2500 V ³⁾
Grid No.2 voltage	V_{g_2}	=	max.	550 V
		=	min.	350 V
Grid No.1 voltage				
negative value	$-V_{g_1}$	=	max.	150 V
positive value	$+V_{g_1}$	=	max.	0 V
peak negative value	$-V_{g_1 p}$	=	max.	400 V ³⁾
peak positive value	$+V_{g_1 p}$	=	max.	2 V

1) Voltage range necessary for optimum overall focus at $100 \mu A$ beam current.

2) Absolute limit.

3) Maximum pulse duration = 22% of a cycle, but maximum 1.5 msec.

7Z2 2055

LIMITING VALUES (Design centre limits) (continued)

Cathode to heater voltage

cathode positive	V_{kf} (k pos) = max. 250 V ⁵⁾⁶⁾
cathode negative	V_{kf} (k neg) = max. 135 V ⁵⁾
peak value, cathode positive	V_{kfp} (k pos) = max. 300 V
peak value, cathode negative	V_{kfp} (k neg) = max. 180 V

CATHODE DRIVE SERVICE

Unless otherwise stated, voltages are with respect to grid No.1.

OPERATING CHARACTERISTICS

Final accelerator voltage	V_{a, g_3, g_5} =	18	18 kV
Grid No.2 voltage	V_{g_2} =	400	500 V
Grid No.4 voltage	V_{g_4} =	0 to 400	0 to 400 V ¹⁾
Cathode voltage for visual extinction of focused raster	V_k =	36 to 66	45 to 79 V

1) Voltage range necessary for optimum overall focus at 100 μ A beam current.

5) In order to avoid excessive hum the A.C. component of the heater to chassis voltage should be as low as possible and must not exceed 20 V (R.M.S.).

6) During an equipment warm-up period not exceeding 15 sec V_{kf} is allowed to rise to 410 V. Between 15 and 45 seconds after switching on a decrease in V_{kf} proportional with time from 410 V to 250 V is permissible.

7Z2 2056

CATHODE DRIVE SERVICE (continued)

Unless otherwise stated, voltages are with respect to grid No.1.

LIMITING VALUES (Design centre limits)

Final accelerator voltage at

$$I_{a, g_3, g_5} = 0 \mu A \quad V_{a, g_3, g_5} = \text{max.} \quad 18 \text{ kV}$$

$$\text{Final accelerator voltage} \quad V_{a, g_3, g_5} = \text{min.} \quad 11 \text{ kV } 2)$$

Grid No.4 voltage

$$\text{positive value} \quad V_{g_4} = \text{max.} \quad 1000 \text{ V}$$

$$\text{negative value} \quad -V_{g_4} = \text{max.} \quad 500 \text{ V}$$

$$\text{peak positive value} \quad V_{g_4 p} = \text{max.} \quad 2500 \text{ V } 3)$$

$$\text{Grid No.2 voltage} \quad V_{g_2} = \text{max.} \quad 700 \text{ V}$$

$$\text{Grid No.2 to cathode voltage} \quad V_{g_2 - k} = \text{max.} \quad 550 \text{ V } 4)$$

$$= \text{min.} \quad 350 \text{ V } 4)$$

Cathode voltage

$$\text{positive value} \quad V_k = \text{max.} \quad 150 \text{ V}$$

$$\text{negative value} \quad -V_k = \text{max.} \quad 0 \text{ V}$$

$$\text{peak positive value} \quad V_{kp} = \text{max.} \quad 400 \text{ V } 3)$$

$$\text{peak negative value} \quad -V_{kp} = \text{max.} \quad 2 \text{ V}$$

Cathode to heater voltage

$$\text{cathode positive} \quad V_{kf} \text{ (k pos)} = \text{max.} \quad 250 \text{ V } 5)6)$$

$$\text{cathode negative} \quad V_{kf} \text{ (k neg)} = \text{max.} \quad 135 \text{ V } 5)$$

$$\text{peak value, cathode positive} \quad V_{kfp} \text{ (k pos)} = \text{max.} \quad 300 \text{ V}$$

$$\text{peak value, cathode negative} \quad V_{kfp} \text{ (k neg)} = \text{max.} \quad 180 \text{ V}$$

2) Absolute limit.

3) Maximum pulse duration = 22% of a cycle, but maximum 1.5 msec.

4) At max. beam current ($V_{k-g_1} = 0 \text{ V}$)

5)6) See page 7.

7Z2 2057

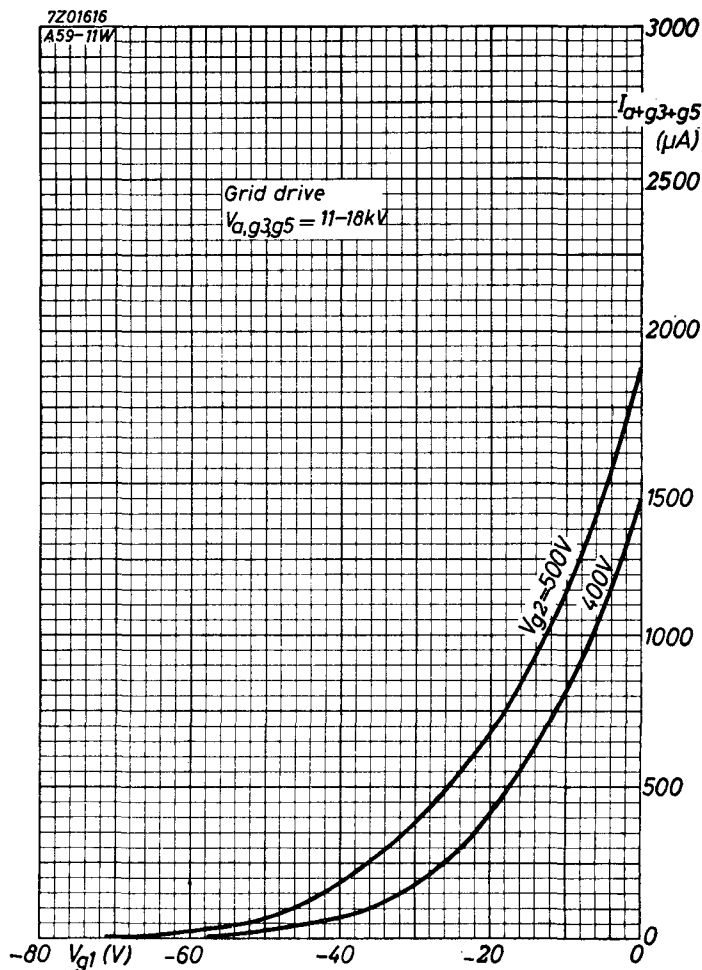
CIRCUIT DESIGN VALUES for both grid drive service and cathode drive service

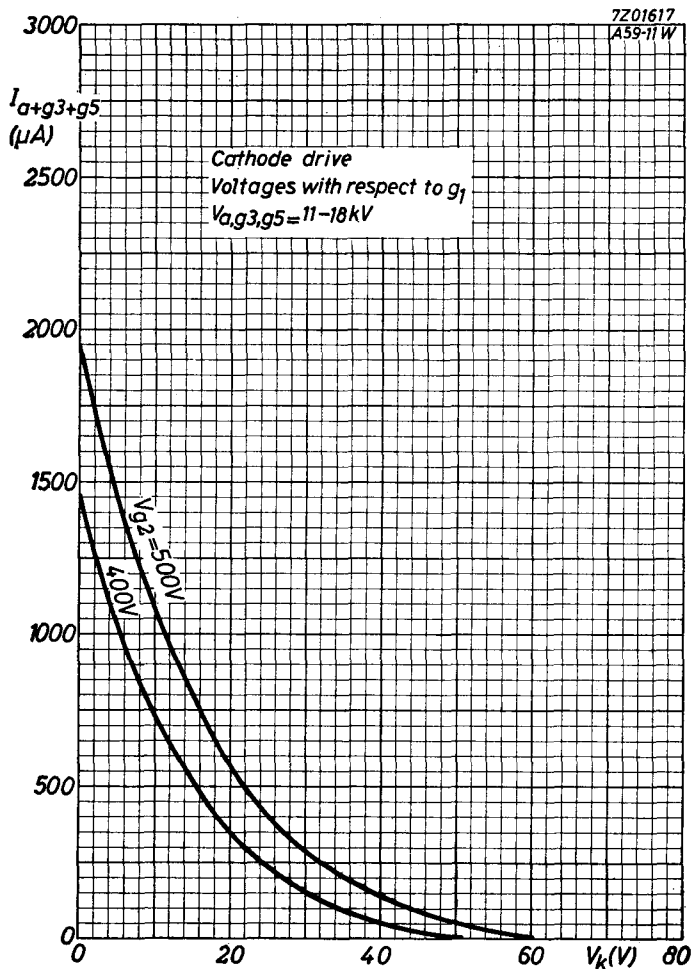
Positive grid No.4 current	I_{g4}	= max. 25 μ A
Negative grid No.4 current	$-I_{g4}$	= max. 25 μ A
Positive grid No.2 current	I_{g2}	= max. 5 μ A
Negative grid No.2 current	$-I_{g2}$	= max: 5 μ A

MAX. CIRCUIT VALUES for both grid drive service and cathode drive service

Grid No.1 circuit resistance	R_{g1}	= max. 1.5 M Ω
Grid No.1 circuit impedance	Z_{g1} (f = 50 c/s)	= max. 0.5 M Ω
Resistance between cathode and heater	R_{kf}	= max. 1 M Ω
Impedance between cathode and heater	Z_{kf} (f = 50 c/s)	= max. 0.1 M Ω

7Z2 2058







A59-16W

page	sheet	date
1	1	1964.02.02
2	2	1964.02.02
3	3	1964.02.02
4	4	1964.02.02
5	5	1964.02.02
6	6	1964.02.02
7	7	1964.02.02
8	8	1964.02.02
9	9	1964.02.02
10	10	1964.02.02
11	11	1964.02.02
12	A	1964.02.02
13	B	1964.02.02
14	FP	2000.03.06