

**3BYP2  
3BYP7  
3BYP11  
3BYP31**

**DESCRIPTION**

Cathode-ray tube with flat face and post deflection acceleration by means of a helical electrode. The tube is intended for use in transistorized oscilloscopes.

**ELECTRICAL DATA**

*Heating*

Heater voltage 6.3 V  
Heater current 0.095 A

*Focusing method*

electrostatic

*Deflection method*

double electrostatic

$D_1D_2$  symmetrical

$D_3D_4$  symmetrical

$90^\circ \pm 1$

Angle between  $D_1D_2$  and  $D_3D_4$  traces

*Direct interelectrode capacitances*

$D_1$ to all other electrodes except $D_2$	4.0	$\mu\mu\text{F}$
$D_2$ to all other electrodes except $D_1$	4.0	$\mu\mu\text{F}$
$D_3$ to all other electrodes except $D_4$	3.5	$\mu\mu\text{F}$
$D_4$ to all other electrodes except $D_3$	3.5	$\mu\mu\text{F}$
$D_1$ to $D_2$	1.9	$\mu\mu\text{F}$
$D_3$ to $D_4$	1.7	$\mu\mu\text{F}$
Grid No.1 to all other electrodes	5.7	$\mu\mu\text{F}$
Cathode to all other electrodes	3.0	$\mu\mu\text{F}$

**OPTICAL DATA**

	<b>P2</b>	<b>P7</b>	<b>P11</b>	<b>P31</b>
Fluorescent colour	yell. green	purplish blue	blue	green
Phosphorescent colour	yell. green	yell. green	blue	green
Persistence	med. short	long	med. short	med. short

Useful screen diameter 68 mm

**MECHANICAL DATA**

Cathode coated, unipotential  
Outline see drawing  
Base 14 pin base, see drawing  
Bulb contact recessed cavity button  
Socket is supplied with the tube  
Mounting position any<sup>1)</sup>

**LINE WIDTH (measured with shrinking raster method)**

Grid No.6 voltage	1200	V
Grid No.4 voltage	300	V
Grid No.2 voltage	1200	V
Beam current	10	$\mu\text{A}$
Line width	0.65	mm

**HELIX RESISTANCE**

Post deflection acceleration helix resistance min. 40 MO

<sup>1)</sup> see foot-note on para 3.

## MAXIMUM RATINGS (design centre values)

Post accelerator (grid No.6) voltage	{ max.	2500	V
	{ min.	1200	V
Isolation shield (grid No.5) voltage	max.	2200	V
Accelerator (grid No.4) voltage	{ max.	2100	V
	{ min.	300	V
Ratio grid No.6 voltage/grid No.4 voltage	max.	4	
Focusing (grid No.3) voltage	max.	1000	V
Grid No.2 voltage	{ max.	1600	V
	{ min.	800	V <sup>2)</sup>
Grid No.1 voltage { negative	max.	200	V
	{ positive	max.	0
Peak voltage between grid No.4 and any deflection plate	max.	500	V
Voltage between cathode and heater	cathode positive	max.	100
		cathode negative	max.
Screen dissipation	max.	3	mW/cm <sup>2</sup>
Cathode current	max.	200	$\mu$ A <sub>rms</sub>

## MAXIMUM CIRCUIT VALUES

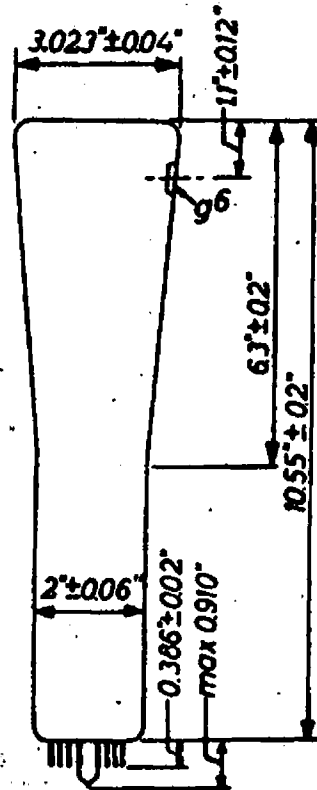
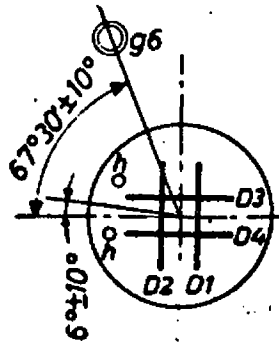
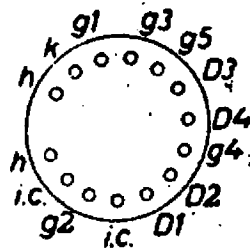
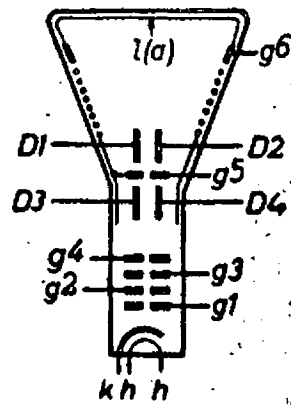
Grid No.1 circuit resistance	max.	1.5	M $\Omega$
Deflection plate resistance	max.	50.000	$\Omega$ <sup>3)</sup>

## TYPICAL CHARACTERISTICS

Grid No.6 voltage		1200	V
Grid No.5 voltage		300 $\pm$ 30	V
Grid No.4 voltage		300 <sup>+40</sup> <sub>-15</sub>	V
Grid No.3 voltage		20 to 150	V
Grid No.2 voltage		1200	V
Neg. grid No.1 voltage		30 to 80	V <sup>4)</sup>
Deflection factor { vertical $D_3 - D_4$		3.2 to 4.1	V/cm
		horizontal $D_1 - D_2$	9.4 to 12
Deviation of the linearity of deflection	max.	2	% <sup>5)</sup>
Spot position (undeflected)		4	mm radius <sup>6)</sup>
Pattern distortion	max.	2	% <sup>7)</sup>
Useful scan		45 x 60	mm

## CIRCUIT DESIGN VALUES

Neg. grid No.1 voltage		30 to 60	V <sup>8)</sup>
Deflection factor for grid No.6 voltage/grid No.4 voltage	vertical	6.9 to 8.8	V/cm <sup>9)</sup>
	horizontal	17.9 to 22.8	V/cm <sup>9)</sup>
Deflection factor for grid No.6 voltage/grid No.4 voltage = 4	vertical	10.7 to 13.7	V/cm <sup>9)</sup>
	horizontal	31.3 to 40.0	V/cm <sup>9)</sup>
Grid No.3 current		-15 to +10	$\mu$ A <sup>10)</sup>



## NOTES

- 1) The socket should under no circumstances be used to support the tube.
- 2) In order to obtain satisfactory focus quality and maximum screen current it is recommended not to apply to this electrode a voltage less than the indicated value.
- 3) If use is made of the full deflection capabilities of the tube, the deflection plates will intercept part of the electron beam near the edge of the scan; a low impedance deflection plate drive is desirable in this case.
- 4) For visual extinction of the focused spot.
- 5) The sensitivity (for both  $D_1D_2$  and  $D_3D_4$  plate pairs) for a deflection of less than 75% of the useful scan will not differ from the sensitivity for a deflection of 25% of the useful scan by more than the indicated value.
- 6) With the tube shielded the spot will be within a circle of 4 mm radius that is centered with respect to the tube face.
- 7) With a raster pattern the size of which is adjusted so that the widest points of the pattern just touch the sides of a square 40.8 mm on a side, no point of these pattern sides will be within an inscribed square of 39.2 mm on a side.
- 8) Per kV of grid No.2 voltage.
- 9) Per kV of grid No.4 voltage.
- 10) For calculating of the grid No.3 potentiometer a grid No.3 current of min.  $-15 \mu A$  and max.  $+10 \mu A$  must be taken into account.