# 31B82

## CATHODE RAY TUBE—ALL ELECTROSTATIC 5" DIA.
## Helical Post Deflection Acceleration
## For High Performance Oscillography

### GENERAL

The 31B82 is a precision Cathode Ray Tube designed for high performance oscillography. It has high deflection sensitivity and a helical post-deflection accelerator which allows the application of high p.d.a. ratios. The screen is aluminised and the deflector plates are brought out to side arms.

### RATING

| | | | |
|---|---|---|---|
| Heater Voltage | $V_h$ | 6·3 | V |
| Heater Current | $I_h$ | 0·6 | A |
| Maximum Final Anode Voltage | $V_{a4(max)}$ | 12 | kV |
| Maximum Second Anode Voltage | $V_{a2(max)}$ | 800 | V |
| Maximum First and Third Anode Voltage | $V_{a1,a3(max)}$ | 2 | kV |
| Maximum Negative Grid Voltage | $V_{g(max)}$ | −200 | V |
| Maximum Positive Grid Voltage | $V_{g(max)}$ | 0* | V |
| Maximum Third Anode Peak Voltage to X or Y plates | $V_{a3(pk)max}$ | 500 | V |
| Maximum Heater/Cathode Voltage | $V_{h-k(max)}$ | 180 | V |
| Maximum Isolating Shield Voltage | $V_{is(max)}$ | 2·1 | kV |
| Maximum Deflector Plate Shield Voltage | $V_{def(max)}$ | 2·1 | kV |

* The grid must not become positive with respect to cathode.



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## INTER-ELECTRODE CAPACITANCES (pF)†

| | | |
|---|---|---|
| Cathode/All other electrodes | $c_{k\text{-all}}$ | 4·6 |
| Grid/All other electrodes | $c_{g\text{-all}}$ | 6·4 |
| X1 Deflecting Plate/X2 Deflecting Plate | $c_{x1\text{-}x2}$ | 1·9 |
| Y1 Deflecting Plate/Y2 Deflecting Plate | $c_{y1\text{-}y2}$ | 1·5 |
| X1 Deflecting Plate/All other electrodes | $c_{x1\text{-all}}$ | 3·5 |
| X2 Deflecting Plate/All other electrodes | $c_{x2\text{-all}}$ | 3·5 |
| Y1 Deflecting Plate/All other electrodes | $c_{y1\text{-all}}$ | 2·8 |
| Y2 Deflecting Plate/All other electrodes | $c_{y2\text{-all}}$ | 2·8 |

† With holder balanced out.

## POST DEFLECTION ACCELERATOR—Helical

| | | | |
|---|---|---|---|
| Resistance | $R_{pda}$ | 200–600 | MΩ |

## ORIENTATION

Looking at the screen with the p.d.a. contact to the left, a positive potential applied to X1 will deflect the spot to the left and a positive potential applied to Y1 will deflect the spot upward.



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## DIMENSIONS

| | |
|---|---|
| Maximum Overall Length | 469 mm |
| Maximum Screen Diameter | 135·4 mm |
| Maximum Neck Diameter | 52·55mm |

## MOUNTING

The tube should not be supported by the base alone, but should preferably be held in a rubber-lined clamping ring at the screen end together with a similar clamp round the magnetic screen close to the base.
The socket should have sufficient freedom of movement to accommodate the tube overall length tolerance and a small amount of lateral float to ensure good pin contact without straining the base.

## SCREEN PHOSPHORS

| *Type* | *Colour* | *Persistence* | *Application* |
|---|---|---|---|
| T1 | Green | Medium | Visual |
| T3 | Blue Actinic | Short | Photographic |
| T4 | White | Medium Short | Visual/ Photographic |
| T6 | Yellow Afterglow | Long | Visual |
| T7 | Orange Afterglow | Very Long | Visual |
| T8 | Yellow Afterglow | Medium Long | Visual |



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### TYPICAL OPERATION

| | | |
|---|---|---|
| Final Anode Voltage | $V_{a4}$ | 10 kV |
| Second Anode Voltage | $V_{a2}$ | 180 to 590 V |
| First and Third Anode Voltage | $V_{a1,a3}$ | 1·67kV |
| Grid Bias Voltage for cut-off | $V_g$ | −50 to −80 V |
| Isolation Shield Voltage | $V_{is}$ | 1·57 to 1·7*kV |
| Deflector Plate Shield Voltage | $V_{def}$ | 1·57 to 1·7‡kV |

* The inner end of the helix and the isolation shield are connected together inside the tube. With the correct potential on these electrodes, barrel and pin-cushion effects are minimised.

‡ Adjustment of the deflection plate shield potential controls the linearity of the Y deflection by variation of the edge effect of the Y deflection plates.

For many purposes the deflection plate shield (pin 12) may be connected externally to the isolation shield.

### DEFLECTION CHARACTERISTICS—Under above conditions

| | | |
|---|---|---|
| Sensitivity of X Plates | $S_x$ | $\frac{560}{V_{a3}}$ mm/V |
| Sensitivity of Y Plates | $S_y$ | $\frac{2800}{V_{a3}}$ mm/V |
| Useful X Plate Scan | | 10 cm |
| Useful Y Plate Scan | | 4 cm |

The undeflected spot will fall within a circle of 5 mm radius from the centre of the tube face.

Orthogonality of deflection axes : ± 1%

The edges of a raster the size of the useful scan will not deviate from the mean rectangle by more than 1·5%.



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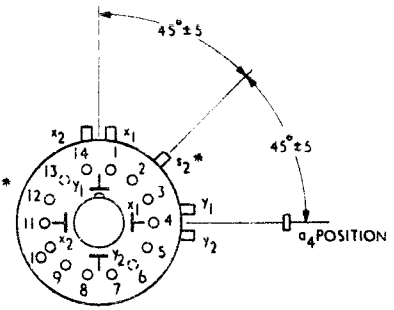
**SIDE CONTACT**—CT8

**BASE**—B14A (Diheptal)




Viewed from free end of pins.

**CONNECTIONS**

| | | |
|---|---|---|
| Pin 1 | Heater | h |
| Pin 2 | Cathode | k |
| Pin 3 | Grid | g |
| Pin 4 | No Connection | NC |
| Pin 5 | Second Anode | a2 |
| Pin 6 | No Pin | NP |
| Pin 7 | No Connection | NC |
| Pin 8 | No Connection | NC |
| Pin 9 | First and Third Anode | a1, a3 |
| Pin 10 | No Connection | NC |
| Pin 11 | No Connection | NC |
| Pin 12* | Deflector Plate Shield | S1 |
| Pin 13 | No Pin | NP |
| Pin 14 | Heater | h |
| Cap | Final Anode | a4 |
| * | Isolation Shield | S2 |



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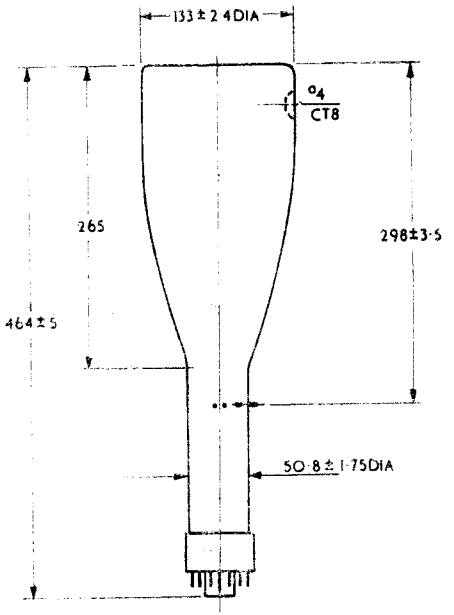


All Dimensions in mm.



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