

MATSUMITA ELECTRONICS CORPORATION
TAKATSUKI JAPAN



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Type 3BWP1

REGISTRATION DATA

Date issued October 21, 1961

National 3BWP1 is a 3-inch oscilloscope tube with flat face, single gun, electrostatic focus and electrostatic symmetrical deflections.

The tube has the following main features.

Very high deflection sensitivity, permitting the use of smaller amplifiers both for the time-base and the signal examination.

High brilliancy at small spot dimensions is achieved by high-grade phosphor screen.

As a result of these characteristics, the tube is an outstanding type for measuring equipment with a high standard of accuracy.

ELECTRICAL DATA

Heater Voltage	6.3 Volts
Heater Current at 6.3 Volts	$0.3 \pm 10\%$ Amperes
Focusing Method	Electrostatic
Deflection Method	Electrostatic
Direct Interelectrode Capacitances Approximate	
Grid No. 1 to all other electrodes	$6.6 \mu\mu\text{F}$
Cathode to all other electrodes	$4.0 \mu\mu\text{F}$
D ₁ to D ₂	$2.6 \mu\mu\text{F}$



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D ₃ to D ₄	2.0 $\mu\mu\text{F}$
D ₁ to all other electrodes	6.0 $\mu\mu\text{F}$
D ₂ to all other electrodes	6.0 $\mu\mu\text{F}$
D ₃ to all other electrodes	5.8 $\mu\mu\text{F}$
D ₄ to all other electrodes	5.8 $\mu\mu\text{F}$

OPTICAL DATA

Phosphor Number	P 1
Fluorescent Color	Green
Phosphorescent Color	Green
Persistence	Medium

MECHANICAL DATA

Overall Length	11 1/2 $\pm$ 1/8 Inches
Greatest Diameter of Bulb	3 $\pm$ 1/16 Inches
Minimum Useful Screen Diameter	2 3/4 Inches
Base	B 12 — 43
Base Alignment	
D ₃ — D ₄ trace aligns with pin No. 6 and tube axis $\pm$ 10 degrees.	
Positive voltage on D ₁ deflects beam approximately toward pin No. 3.	
Positive voltage on D ₃ deflects beam approximately toward pin No. 12.	
Angle between D ₁ — D ₂ and D ₃ — D ₄ trace	90 $\pm$ 1.5 degrees

MAXIMUM RATING

Accelerator Voltage	2500 Max. Volts DC
Accelerator Input	6 Max. Watts
Grid No. 3 (Focusing Electrode) Voltage	1000 Max. Volts DC
Grid No. 1 Voltages	
Negative-Bias Value	200 Max. Volts DC
Positive-Bias Value	0 Max. Volts DC
Positive Peak Value	2 Max. Volts
Peak Heater-Cathode Voltages	
Heater Negative with Respect to Cathode	180 Max. Volts
Heater Positive with Respect to Cathode	180 Max. Volts



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Peak Voltage between Accelerator and any Deflection Electrode 500 Max. Volts

TYPICAL OPERATING CONDITIONS

Accelerator Voltage 1500 Volts

Grid No. 3 Voltage (Focusing Voltage) 247 to 397 Volts

Grid No. 1 Voltage (Note 1) -40 to -80 Volts

Deflection Factor :

D_1 and D_2 62.3 to 75.8 Volts DC per Inch

D_3 and D_4 42.8 to 52.5 Volts DC per Inch

Useful Scan $D_1 - D_2$ $2\frac{1}{2}$ Inches

Useful Scan $D_3 - D_4$ $2\frac{1}{4}$ Inches

Focusing Electrode Current for any Operating Condition: -15 to +10 Microamperes

Spot position (undeflected) (Note 2) $\frac{3}{16}$ Inches

For accelerator voltage not shown in the preceding table, the following can be as a guide.

Focusing Voltage 16.5% to 26.5% of Accelerator Voltage

Grid No. 1 Voltage -2.7% to -5.3% of Accelerator Voltage

Deflection Factor

D_1 and D_2 41.5 to 50.5 Volts DC per Inch per Kilovolt of Accelerator

D_3 and D_4 28.5 to 30 Volts DC per Inch per Kilovolt of Accelerator

MAXIMUM CIRCUIT VALUES

Grid No. 1 Circuit Resistance 1.5 Max. Megohms

Resistance in any Deflection-Electrode Circuit (Note 3) 5 Max. Megohms

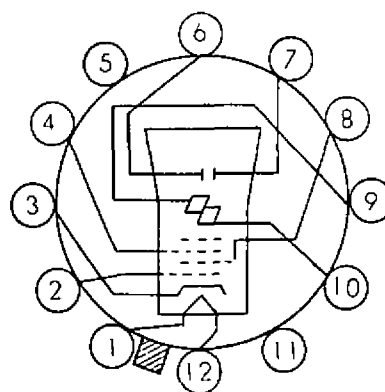
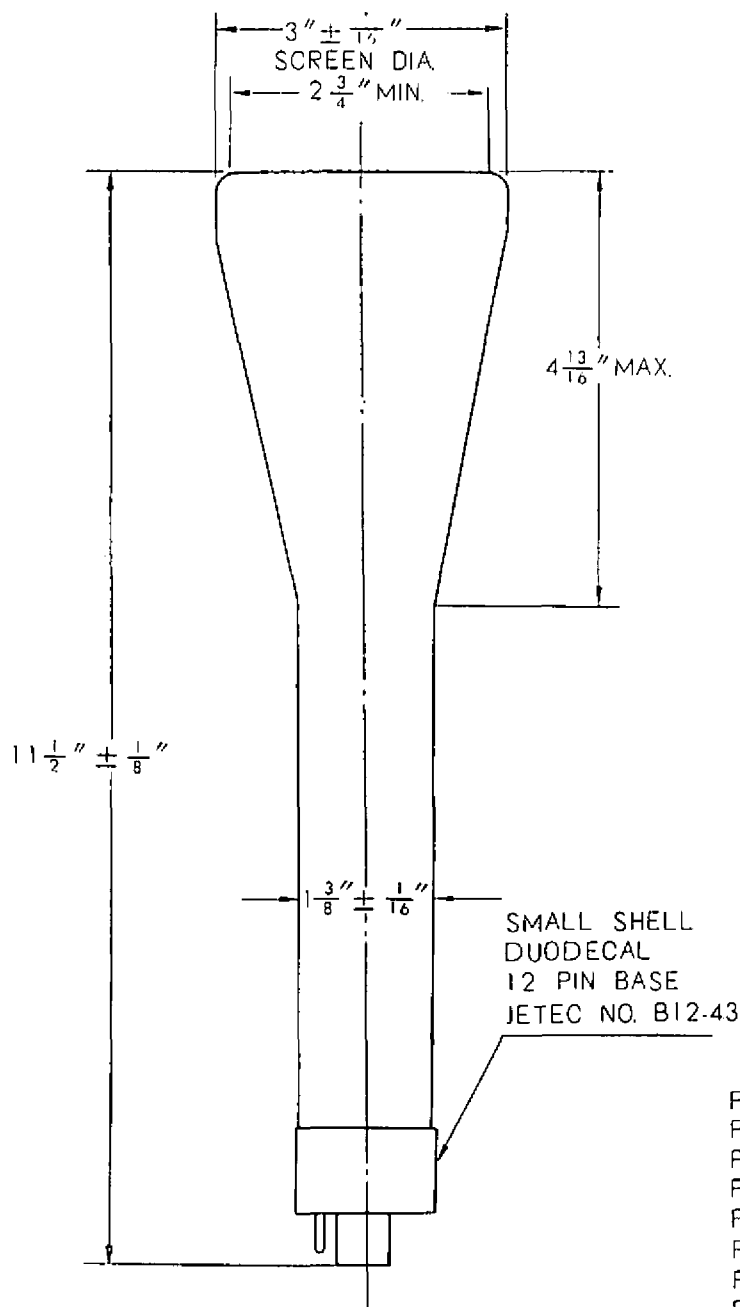
Notes:

1. Visual extinction of undeflected focused spot.
2. Connect free deflecting electrode to anode.
3. It is recommended that the deflecting-electrode-circuit resistances are approximately equal.



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BOTTOM VIEW OF BASE
CONNECTION

- PIN 1 —Heater
- PIN 2 —Grid No. 1
- PIN 3 —Cathode
- PIN 4 —Grid No. 3 (Focusing Electrode)
- PIN 5 —N. C.
- PIN 6 —Deflecting Electrode D1
- PIN 7 —Deflecting Electrode D2
- PIN 8 —Accelerator (Grid No. 2 Grid No. 4)
- PIN 9 —Deflecting Electrode D4
- PIN 10 —Deflecting Electrode D3
- PIN 11 —N. C.
- PIN 12 —Heater

Matsushita Electronics Corp.

300, Nishiyosumi, Osaka-fu
Takatsuki, Japan.