

Image Converter Tube

Monovoltage Type Having S-1 Spectral Response

GENERAL

Spectral Response S-1
Wavelength of Maximum Response 800 ± 100 nm

Photocathode:

Material Ag-O-Cs

Minimum useful diameter 19.05 mm (0.750 in)

Image surface:

Shape Convex

Window

Index of refraction at 589.3 nm 1.48

Fluorescent Screen:

Minimum useful diameter 14.48 mm (0.570 in)

Phosphor P20, Aluminized

Fluorescence and phosphorescence Yellow-Green

Persistence Medium to Medium Short

Image surface:

Shape Flat

Window

Index of refraction at 589.3 nm 1.48

Focusing Method Electrostatic

Tube Dimensions:

Overall length $2.285 \text{ in} \pm 0.050 \text{ in}$

Maximum diameter $1.350 \text{ in} \pm 0.025 \text{ in}$

Operating Position Any

Weight 1.5 oz

MAXIMUM RATINGS, *Absolute-Maximum Values*

Anode Voltage:^b

Average (DC) 12500 max. V

Peak Instantaneous 13000 max. V

Average Photocathode Current

(Continuous operation)^c 0.35 max. μA

Peak Photocathode Current^d 3.5 max. μA

Ambient Temperature 75 max. $^{\circ}\text{C}$



Electronic
Components

DATA 1
8-70

CHARACTERISTICS AT AMBIENT TEMPERATURE OF 22°C

Anode Voltage (DC)^b 12000 VTypical Paraxial Magnification Factor^e 0.75 —→ Minimum Conversion Index^f 15 —→ Minimum Resolution^g 50 line-pairs/mmMaximum Quotient^h of Screen Background
by Conversion Index 3.3×10^{-7} lm/cm²

Sensitivity:

→ Radiant^j 2.3 mA/W→ Luminous^k 25 μ A/lm^b Referred to photocathode.^c Averaged over any interval of 10 seconds maximum.^d The 6929 should not be subjected to this peak photocathode current value more than 10 times during the useful life of the tube. No single time period during which this current is drawn should exceed 2 minutes.^e Defined as the ratio of the linear size of the image on the fluorescent screen to the linear size of the image on the photocathode. The image on the photocathode consists of two parallel lines 0.08" long, each located 0.08" from the tube axis. Size of the image on the fluorescent screen is determined by measuring the spacing between the two parallel lines.^f Ratio of luminous flux from fluorescent screen to the product of the luminous flux incident on Corning No. 2540 infrared filter (Melt No. 1613, 2.61 mm thick) or equivalent, and the filter factor of 10.8 per cent. The light source is a tungsten-filament lamp operated at a color temperature of 2854° K.^g The resolution, both horizontally and vertically in a 0.15-inch-diameter circle centered on the photocathode, is determined with a pattern consisting of alternate black and white lines of equal width. Any two adjacent lines are designated as a "line-pair".^h The value of this quotient for any individual tube multiplied by the square of the magnification factor of the tube gives that value of the incident illumination from 2854° K source required to produce an increase in screen brightness equal to the screen background.

→ Indicates a change

- j For incident radiation at the wavelength of maximum response of the spectral sensitivity characteristic.
- k Under the following conditions: The light source is a tungsten-filament lamp having a lime-glass envelope. The lamp is operated at a color temperature of 2854° K. The value of light flux is 0.01 lumen and 200 volts are applied between anode and cathode.

SAFETY PRECAUTIONS

X-Radiation Warning

This tube in operation produces X-rays which can constitute a health hazard unless the tube is adequately shielded. Make sure the shielding provides the required protection against personal injury.

High Voltage

The high voltage at which the tube is operated may be very dangerous. Great care should be taken in the design of apparatus to prevent the user from coming in contact with the high voltage.

Operating Considerations

HANDLING The tubes should be handled by the metal terminals. Fingerprints on the glass should be avoided since they cause leakage current, corona, and higher screen background. To minimize the possibility of leakage current and corona, the external surface of the glass side wall is coated with a transparent, non-hygroscopic film. This film should be cleaned only with a soft dry cloth.

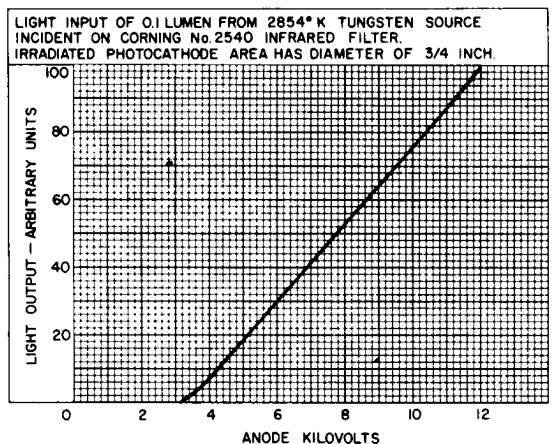
Subjecting the tube to intense incident-radiation levels may temporarily decrease the tube's sensitivity even though there is no voltage applied. The magnitude and duration of this decrease depend on the length of exposure. Permanent damage to the tube may result if it is exposed to radiant energy so great as to cause excessive heating of the photocathode.

Connections to the two terminals of the tube, indicated on the Dimensional Outline, should not be soldered to the terminals. They may be made by spring fingers engaging the

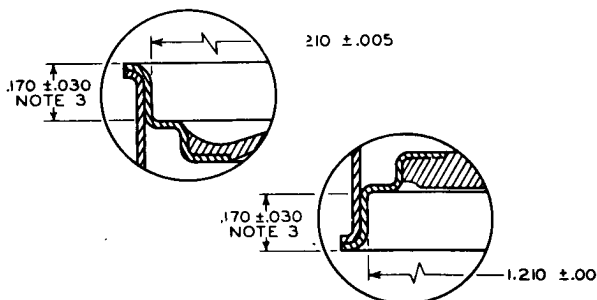
rim or the straight side of each terminal.

Magnetic shielding of this image tube is required to minimize the effects of extraneous fields on tube performance. It is to be noted that ac magnetic fields are particularly objectionable in that they seriously impair tube resolution. If an iron or steel case is used, care should be taken in its construction to insure that the case is completely demagnetized.

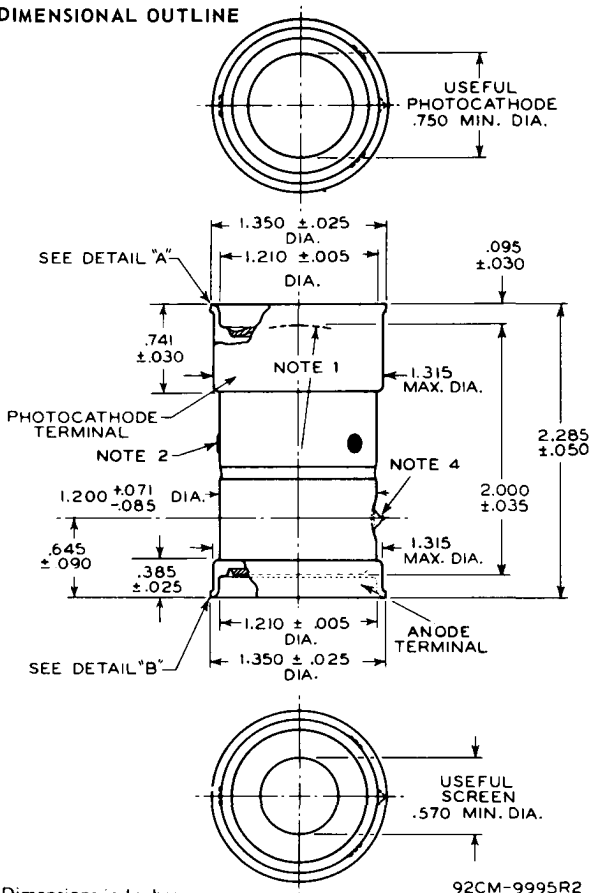
TYPICAL CHARACTERISTICS



DIMENSIONAL OUTLINE DETAILS



DIMENSIONAL OUTLINE



Dimensions in Inches

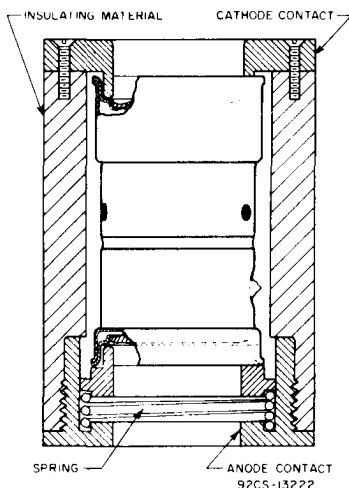
Note 1: Radius of curvature of faceplate is $1.230'' \pm 0.005''$; faceplate thickness at center is $0.060'' \pm 0.004''$.

Note 2: Three insulated lead tips will not extend beyond maximum O.D. of tube. Leads are used only during tube manufacture.

Note 3: Depth is measured to tangent of the two radii.

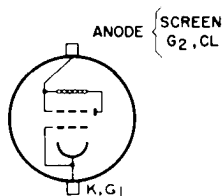
Note 4: Tip will not extend beyond maximum O.D. of tube.

TYPICAL MOUNTING ARRANGEMENT



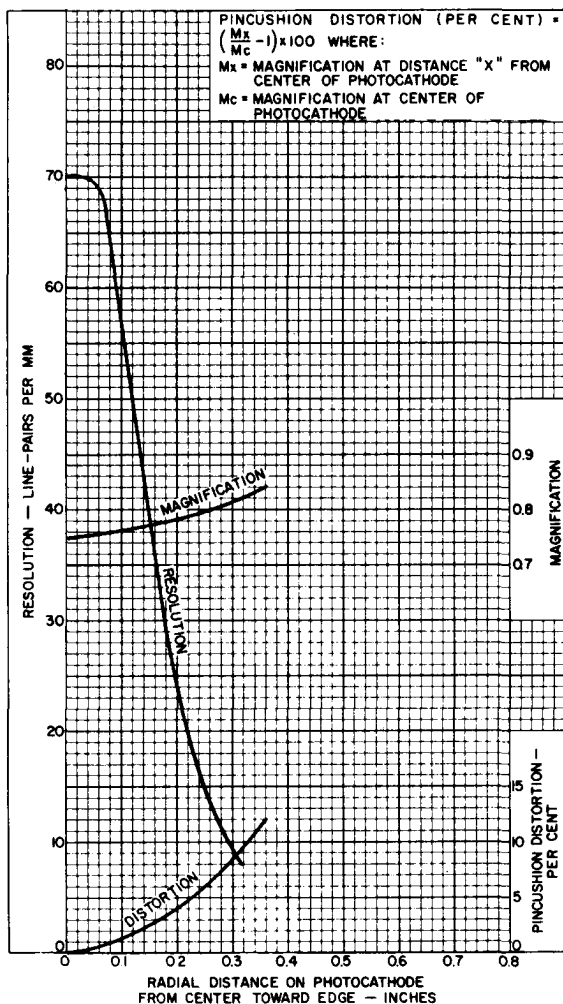
TERMINAL CONNECTIONS

- C_L : Collector
 G_1 : Grid No.1
 (Focusing Electrode)
 G_2 : Grid No.2
 (Focusing &
 Accelerating Electrode)
 K : Photocathode



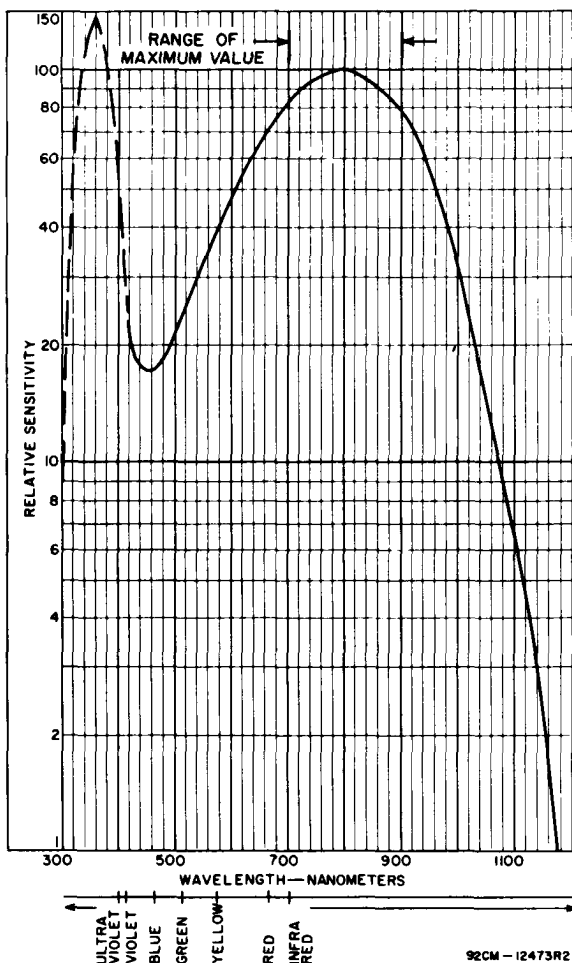
Direction of incident radiation:
 Perpendicular to photocathode end of tube

TYPICAL CHARACTERISTICS



92CM-13279RI

TYPICAL SPECTRAL RESPONSE CHARACTERISTIC



The dashed portion shown in the above curve of the spectral response is not controlled.