

# Photomultiplier Tube

10-STAGE, CURVED-FACEPLATE TYPE HAVING S-10 RESPONSE

1-11/16 INCH MINIMUM DIAMETER CURVED PHOTOCATHODE

## GENERAL

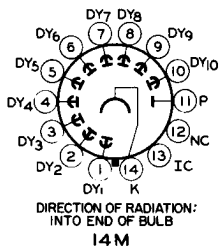
Spectral Response. . . . .	S-10
Wavelength of Maximum Response . . . . .	4500 ± 300 angstroms
Cathode, Semitransparent . . . . .	Ag-Bi-O-Cs
Shape. . . . .	Curved, Circular
Minimum area . . . . .	2.2 sq in
Minimum diameter . . . . .	1-11/16 in
Window . . . . .	Lime Glass (Corning <sup>a</sup> No.0080), or equivalent
Index of refraction. . . . .	1.51
Dynode Material. . . . .	Cs-Sb
Direct Interelectrode Capacitances (Approx.)	
Anode to dynode No.10 . . . . .	4.2 pF
Anode to all other electrodes. . . . .	6.5 pF
Maximum Overall Length . . . . .	5.81 in
Seated Length. . . . .	4.87 ± 0.19 in
Maximum Diameter . . . . .	2.31 in
Operating Position . . . . .	Any
Weight (Approx.) . . . . .	5.2 oz
Envelope . . . . .	JEDEC T16
Base . Medium-Shell Diheptal 14-Pin (JEDEC Group 5, No. B14-38),	
Non-hygroscopic	
Socket . . . . .	Eby <sup>b</sup> No.9709-7, or equivalent
Magnetic Shield. . . . .	JAN <sup>c</sup> No.S-2004, or equivalent

## ABSOLUTE-MAXIMUM RATINGS

DC or Peak AC Supply Voltage		
Between anode and cathode. . . . .	1250	V
Between dynode No.10 and anode . . . . .	250	V
Between dynode No.1 and cathode. . . . .	300	V
Average Anode Current <sup>d</sup> . . . . .	0.75	mA
Ambient Temperature. . . . .	75	°C

## TERMINAL DIAGRAM (Bottom View)

- Pin 1 - Dynode No.1
- Pin 2 - Dynode No.2
- Pin 3 - Dynode No.3
- Pin 4 - Dynode No.4
- Pin 5 - Dynode No.5
- Pin 6 - Dynode No.6
- Pin 7 - Dynode No.7
- Pin 8 - Dynode No.8
- Pin 9 - Dynode No.9
- Pin 10 - Dynode No.10
- Pin 11 - Anode
- Pin 12 - No Connection
- Pin 13 - Do Not Use
- Pin 14 - Photocathode



←Indicates a change.



## CHARACTERISTICS RANGE VALUES

Under conditions with dc supply voltage (E) across a voltage divider providing 1/6 of E between cathode and dynode No.1; 1/12 of E for each succeeding dynode stage; and 1/12 of E between dynode No.10 and anode

With E = 1000 V (Except as noted)

	Min	Typ	Max	
<b>Sensitivity</b>				
Radiant, at 4500 angstroms	-	$5.1 \times 10^4$	-	A/W
Cathode radiant, at 4500 angstroms . . . . .	-	0.02	-	A/W
Luminous, at 0 c/s <sup>e</sup> . . . . .	10	100	300	A/lm
Cathode luminous				
With tungsten light source <sup>f</sup> . . . . .	$2 \times 10^{-5}$	$4 \times 10^{-5}$	-	A/lm
With red-infrared light source <sup>g</sup> . . . . .	$5 \times 10^{-8}$	-	-	A
<b>Current Amplification</b> . . . . .	-	$2.5 \times 10^6$	-	
<b>Equivalent Anode-Dark-Current Input</b> <sup>h</sup> . . . . .	-	$1.4 \times 10^{-9}$	$2.5 \times 10^{-8}$	1m
At a luminous sensitivity of 20 A/lm				
<b>Equivalent Noise Input</b> <sup>j</sup> . . . . .	-	$4 \times 10^{-11}$	$1.7 \times 10^{-10}$	1m
<b>Dark Current</b> . . . . .	-	-	$7.5 \times 10^{-7}$	A
To any electrode except anode at 25 °C				

With E = 750 V (Except as noted)

	Min	Typ	Max	
<b>Sensitivity</b>				
Radiant, at 4500 angstroms . . . . .	-	$5.1 \times 10^3$	-	A/W
Cathode radiant, at 4500 angstroms . . . . .	-	0.02	-	A/W
Luminous, at 0 c/s <sup>e</sup> . . . . .	-	10	-	A/lm
Cathode luminous				
With tungsten light source <sup>f</sup> . . . . .	$2 \times 10^{-5}$	$4 \times 10^{-5}$	-	A/lm
With red-infrared light source <sup>g</sup> . . . . .	$5 \times 10^{-8}$	-	-	A
<b>Current Amplification</b> . . . . .	-	$2.5 \times 10^5$	-	

<sup>a</sup> Made by Corning Glass Works, Corning, New York.

<sup>b</sup> Made by Hugh H. Eby Company, 4701 Germantown Avenue, Philadelphia 44, Pa.

<sup>c</sup> Made by JAN Hardware Manufacturing Company, 38-01 Queens Blvd., Long Island City 1, New York.

<sup>d</sup> Averaged over any interval of 30 seconds maximum. For best stability, the average anode current value should not exceed 100 microamperes.

<sup>e</sup> Under the following conditions: The light source is a tungsten-filament lamp having a lime-glass envelope. It is operated at a color temperature of 2870°K and a light input of 10 microlumens is used.

<sup>f</sup> Under the following conditions: The light source is a tungsten-filament lamp having a lime-glass envelope. It is operated at a color temperature of 2870°K. The value of light flux is 0.01 lumen and 167 volts are applied between cathode and all other electrodes connected as anode.

<sup>g</sup> Under the following conditions: Light incident on the cathode is transmitted through a red-infrared filter (Combination of Corning C.S. Nos. 3-67 and 7-59, Glass Code No. 3482 and 5850, respectively—Manufactured by the Corning Glass Works, Corning, New York) from a tungsten-filament lamp operated at a color temperature of 2870°K. The value of light flux

→ Indicates a change.

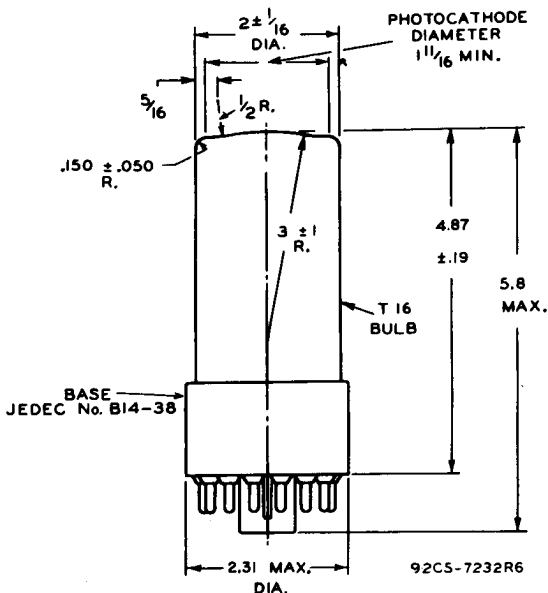


incident on the filter is 0.01 lumen and 167 volts are applied between cathode and all other electrodes connected at anode.

h At a tube temperature of 25°C. Prior to measurement, tube is stored in dark for a period of 30 minutes. Dark current may be reduced by use of a refrigerant.

j Under the following conditions: Supply voltage (E) is as shown, 25°C tube temperature, external shield connected to cathode, bandwidth 1 cycle per second, tungsten-light source at a color temperature of 2870°K interrupted at a low audio frequency to produce incident radiation pulses alternating between zero and the value stated. The "on" period of the pulse is equal to the "off" period.

### DIMENSIONAL OUTLINE



DIMENSIONS IN INCHES

Center line of bulb will not deviate more than 2° in any direction from perpendicular erected at the center of bottom of the base.

SPECTRAL-SENSITIVITY CHARACTERISTIC  
of Phototube having S-10 Response  
is shown at the front of this Section

TYPICAL ANODE CHARACTERISTICS  
are the same as those shown for Type 6199



## Typical Sensitivity and Current Amplification Characteristics

