**Photomultiplier Tube**

**9-STAGE, SIDE-ON TYPE HAVING S-4 RESPONSE**

*For AC-Operated Control Applications Such as Automobile-Headlight Control*

### GENERAL

Spectral Response: S-4

Wavelength of Maximum Response: 4000 ± 500 angstroms

**Cathode, Opaque:**
- Minimum projected length: 0.93 in
- Minimum projected width: 0.31 in

**Window:** Lime Glass (Corning No.0080), or equivalent

**Dynode Material:** Cs-Sb

**Direct Interelectrode Capacitances (Approx.):**
- Anode to dynode No.9: 4.2 pF
- Anode to all other electrodes: 5.5 pF
- Maximum Overall Length: 3.12 in
- Maximum Seated Length: 2.69 in
- Length: 1.56 ± 0.09 in

From base seat to center of useful cathode area

**Maximum Diameter:**

**Operating Position:** Any

**Weight (Approx.):** 1.6 oz

**Envelope:** JEDEC T9

**Base:** Small-Shell Neosubmagnal II-Pin (JEDEC No.B11-104), Non-hygrosopic

**Socket:** Amphenol® No.78S11T, or equivalent

**Magnetic Shield:** Millen® No.80801B, or equivalent

### ABSOLUTE-MAXIMUM RATINGS

**Peak AC Supply Voltage**
- Between anode and cathode: 1400 V
- Between dynode No.9 and anode: 250 V
- Between consecutive dynodes: 250 V
- Between dynode No.1 and cathode: 250 V

**Average Anode Current**

**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 – Anode
- Pin 11 – Photocathode

*Indicates a change.*
CHARACTERISTICS RANGE VALUES

Under conditions with dc supply voltage (E) across a voltage divider providing 1/10 of E between cathode and dynode No.1; 1/10 of E for each succeeding dynode stage; and 1/10 of E between dynode No.9 and anode

With \( E = 1000 \) V dc

<table>
<thead>
<tr>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radiant, at 4000 angstroms</td>
<td>3.4x10^4</td>
<td>A/W</td>
</tr>
<tr>
<td>Luminous, at 0 c/s</td>
<td>35</td>
<td>A/1m</td>
</tr>
<tr>
<td>Dark Current to Any Electrode</td>
<td>7.5 x 10^{-7}</td>
<td>A</td>
</tr>
<tr>
<td>At 25°C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

With \( E = \) Adjustable 60 c/s ac Voltage

<table>
<thead>
<tr>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anode-to-Cathode Voltage</td>
<td>525</td>
<td>750</td>
</tr>
<tr>
<td>RMS values</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anode Dark Current</td>
<td>-</td>
<td>1 x 10^{-7}</td>
</tr>
<tr>
<td>At 25°C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\( a \) On plane perpendicular to the indicated direction of incident light and passing through the major axis of the tube.

\( b \) Made by Corning Glass Works, Corning, New York.

\( c \) Made by Amphenol Electronics Corporation, 1830 South 54th Avenue, Chicago 54, Illinois.

\( d \) Made by James Millen Manufacturing Company, 150 Exchange Street, Malden 48, Massachusetts.

\( e \) Averaged over any interval of 30 seconds maximum.

\( f \) 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 2870⁰K and a light input of 10 microlumens is used.

\( g \) Under the following conditions: Light incident on the cathode is transmitted through a filter (Corning C.S. No.2-62, Glass Code No.2418 which has an effective transmission of luminous flux of 5%—Manufactured by the Corning Glass Works, Corning, New York) from a tungsten-filament lamp operated at a color temperature of 2870⁰K. The value of light flux incident on the filter is 10 microlumens. Supply voltage (E) is adjusted to give an anode current of 8 microamperes.

\( h \) For conditions same as (g) except no radiant flux on photocathode.

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

Note: The maximum angular variation between the planes through pins 1 and 11 and the plane of the grill will not exceed 6°.

DIMENSIONS IN INCHES
DETAIL A

PHOTO-CATHODE

REGION OF BEST COLLECTION

ANODE

.270

SHIELD

BULB

48° 26'

GRILL

.190

.250

.402

DIRECTION OF INCIDENT RADIATION

92CS-8674R2
RECOMMENDED VOLTAGE-DIVIDER NETWORK FOR USE WITH TYPE 6328 IN HEADLIGHT-CONTROL SERVICE

R1  R2  R3  R4  R5
R6  R7  R8  R9  R10:  1 megohm, 1/2 watt
R11:  2 megohms, 1/2 watt
R12:  5.1 megohms, 1/2 watt
R13  R14  R15  R16
R17  R18  R19  R20:  8.2 megohms, 1/2 watt
R21:  820,000 ohms, 1/2 watt
Typical Anode Characteristics

VOLTS/STAGE = 100
LIGHT SOURCE IS A TUNGSTEN-FILAMENT LAMP OPERATED AT A COLOR TEMPERATURE OF 2870° K.
Sensitivity Characteristics

AC SINE-WAVE SUPPLY VOLTAGE (E) ACROSS VOLTAGE DIVIDER PROVIDING 1/10 OF E BETWEEN CATHODE AND DYNOE No. 1; 1/10 OF E FOR EACH SUCCEEDING DYNOE STAGE; AND 1/10 OF E BETWEEN DYNOE No. 9 AND ANODE

SENSITIVITY - AMPERES/LUMEN (COLOR TEMP 2870K)

PEAK AC SUPPLY VOLTS (E)

92CM-957IRIT
Variation in Photocathode Sensitivity Along Its Length

Spot size: 1mm dia., approx.
Variations caused by interception of light by grill as well as surface irregularities have been ignored.

Variation in Photocathode Sensitivity Across Its Projected Width in Plane of Grill

Spot size: 1mm dia., approx.
Grill toward observer, base down.
Cathode width projected normal to plane of grill.
Variations caused by interception of light by grill as well as surface irregularities have been ignored.