

SPECIFICATION SHEET

DESCRIPTION: RADIATION COUNTER GEIGER MUELLER
HIGH SENSITIVITY BETA GAMMA HALOGEN SELF
QUENCHING THIN WALL

TYPE NUMBER 6993

Ratings:	Operating Voltage	TA	Rp	Alt.
absolute	Vdc	°F	Meg	ft.
Maximum:	920	125		20,000
Minimum:	860	-20	1.0	(Note 1)
Test Cond.: (Note 2)	890	-	1.0	-

Dimensions: Per Outline

Tests designated * are standard design tests; tests designated ** are qualification tests; all others are production tests.

1. Marking

Each tube is to be suitably marked to include manufacturer's name or symbol; type number; and month and year of manufacture. A serial number may be utilized in lieu of the date marking.

*2. Shock and Vibration

Tube shall operate properly during and after vibration test and subsequent to shock test. Tests shall be performed as follows:

1. Vibration Test. Tube shall be mounted on the vibration test machine in such a manner that the direction of vibration will be along each of the principal axes separately and vibrated at frequencies from 5 to 23 cps in discrete frequency intervals of one cycle per second. At each integral frequency, the vibration shall be maintained for 3 minutes. The change from one frequency to

the next shall be made slowly and uniformly. The tests shall be made at a table amplitude of 0.030 inch \pm 0.006 inch. (See Note 3).

2. Shock Test. Test shall be made on the NRL Shock Test Machine for tubes. A total of 9 blows shall be applied, 3 blows being applied parallel to each of the three principal axes of the tube being tested. The hammer angle shall be 20° (300 g).

Criterion for passing this test shall be compliance of at least 80% of the tubes with the following requirements:

1. During Vibration:
 - (1) Response Count Rate 5A
 - (2) Change of Response Count Rate: \pm 5% Max.
2. After Vibration and Shock:
 - (1) Response Count Rate 5A
 - (2) Change of Response Count Rate: \pm 5% Max.
 - (3) Plateau length and slope 4

3. Background, Contamination and Photosensitivity

Determine tube response. The counting time shall be two minutes. Maximum allowable count shall be 100 CPM.

Tube shall be mounted in a horizontal position and should be shielded by 2" lead and 1/4" of aluminum interposed between the lead and the tube. The count rate shall be determined using a scaler having a resolving time of not greater than 10 μ sec and a discrimination level of 1 \pm .1 volt. The tube shall be simultaneously exposed to radiation from a GE 15 watt fluorescent lamp and GE 15 watt germicidal lamp or equivalents.

4. Plateau Length and Slope

The plateau length and slope shall be determined utilizing either the standard MIL-E-1C recording rate meter or the scaler of Paragraph 3. At a counting rate of 100 CPS the tube shall have a relative plateau slope not to exceed 20% per 100 volts when evaluated over the range 860-920 volts.

5. Response Count Rate

A. Gamma Response

The counting rate is to be measured for a two-minute period in a uniform radiation field of 5 mr/hr of Cobalt 60 or Radium, using a scaler of Paragraph 3. Tube must be enclosed in a 1/4" aluminum shield. When tested over the operating range of 860-920 volts, the counting rate shall be within the range 2000-4000 cpm.

B. Beta Response

The counting rate is to be measured for a two-minute period using the scaler of Paragraph 3 and at the standard test conditions. Tube will be tested in a standard test fixture containing a calibrated Radium D, E source. Fixture and source are to be supplied by FCDA. Test limits: to be supplied with fixture.

**6. Jamming

The counting rate in a radiation field of 1 r/hr shall not be less than at 50 mr/hr.

Test conditions and Circuit will be specified for this test by FCDA.

**7. Hysteresis

Tube shall operate satisfactorily immediately after operation in a field of 5 R/hr for 30 minutes. Criterion for passing this test shall be compliance of 100% of the tubes with the requirements of Response Count Rate 5A.

*8. Pulse Amplitude

A conventional pulse amplitude test shall be performed at an operating voltage of 860 V. and counting rate of approximately 200 cps. The scope coupling capacitor shall be 50 $\mu\mu\text{f}$. Criterion for passing: 1 volt minimum.

*9. Temperature

The tube will be set up at a nominal radiation field at room temperature at 890 volts. The temperature will then be varied through the range -20°F and $+125^{\circ}\text{F}$. After holding at each terminal temperature for 2 hours, the counting rate will be measured. The maximum allowable change in counting rate from room temperature value will be $\pm 3\%$.

Tubes are rated for storage over the range -50 to $+160^{\circ}\text{F}$.

10. Life

When operating continuously for 500 hours at 890 volts in a radiation field of 0.5 mr/hr the counting rate shall not change by more than $\begin{matrix} +10\% \\ -5\% \end{matrix}$ of the initial value.

Use Test Circuit of paragraph 3.

The number of tubes to be life tested shall be not less than one nor more than three tubes per week. These tubes shall be taken at random by the Government Inspector throughout the production.

11. Insulation

Envelope shall be able to withstand potential of 1600 volts without exhibiting fault to ground or to anode while tube is immersed in water up to but not including the base. Criterion for passing this test: leakage current shall not exceed 1 μ a.

Note 1.

The tube shall be capable of normal operation after transportation at altitudes up to 50,000 ft.

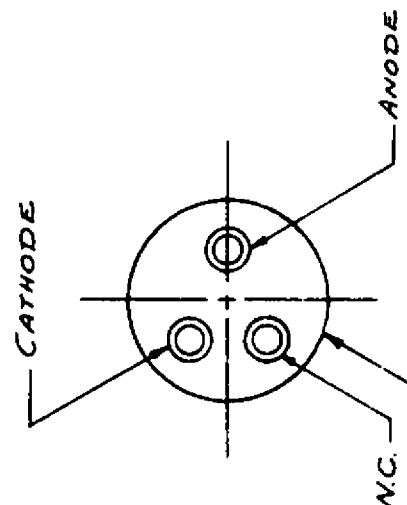
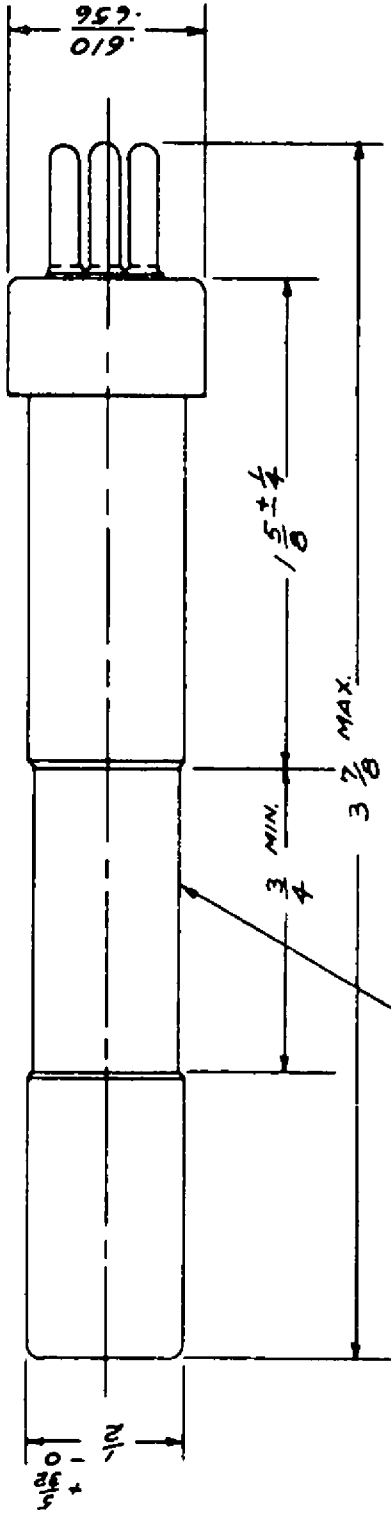
Note 2.

Tests may be performed in any order.

Note 3.

When this test has been completed, the tube may be vibrated for a total period of two hours at any frequency or frequencies, between 5 and 23 cps, axis or axes, which observation and measurement made during the previous test indicated conditions most likely to cause failure. This is a qualification test only.

Note: All dimensions are standard design tests (*).



30 MG/CM²

PEE W/EE 3 PIN BASE
ALL PIN .093 DIA

DRAWING NO. 1