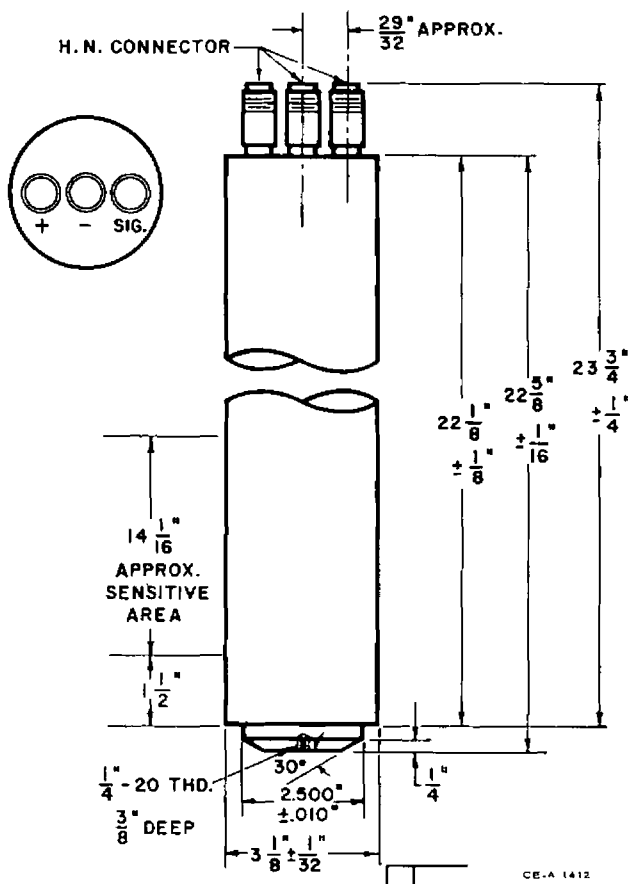


December 5, 1958

ELECTRICALLY COMPENSATED IONIZATION CHAMBER TYPE WL-7353

The WL-7353 is a high purity magnesium alloy, boron lined ionization chamber designed to detect thermal neutrons in the flux range from 2.5×10^2 to 2.5×10^{10} neutrons/cm²/second. This type is extremely rugged* and will operate in any position at temperatures not exceeding 175°F. Connections are made through "HN" type cable fittings. The gas filling is nitrogen at a pressure of 76 cm Hg.

The WL-7353 incorporates two outstanding features. The first is the use of a "guard ring" type of construction to minimize the reduction in signal currents due to leakage through the insulators. The second is the provision for adjustable gamma compensation.† The neutron sensitivity of the chamber is approximately 4×10^{-14} amperes/neutron/cm²/second. Gamma sensitivity is approximately 3×10^{-11} amperes/R/hr when operated uncompensated but is reduced to approximately 3×10^{-13} amperes/R/hr in compensated operation thus extending the operating range two decades lower.



MECHANICAL:

Maximum Diameter	3-5/32	Inches
Maximum Overall Length	24-1/2	Inches
Approx. Sensitive Length	14-1/16	Inches
Net Weight	5-3/8	Pounds
Shipping Weight	19	Pounds

MATERIALS:

Body	Alloy 3% Al, 97% Mg
Insulation	Polystyrene & Alumina
Gas Filling	Nitrogen
Neutron Sensitive Material	Boron enriched to 92% with B-10 1 mg/cm ² thick

MAXIMUM RATINGS:

Absolute Maximum Values	
Thermal Neutron Flux	10^{11} max. n/cm ² /sec
Temperature	175 max. °F
Interelectrode Voltage (dc)	1500 max. Volts

TYPICAL OPERATING CHARACTERISTICS:

Approx. Operating Voltage □	300 to 800	Volts
Compensating Voltage ■	-10 to -80	Volts
Neutron Sensitivity	4×10^{-14}	Amp/n/cm ² /sec
Thermal Neutron Flux Range	2.5×10^2 to 2.5×10^{10}	n/cm ² /sec

Approx. Signal Electrode Output Impedance:

Capacity	160	uuf
Leakage Resistance	10^{14} min.	ohms

TYPICAL SATURATION CHARACTERISTICS:

For Neutron Flux of 2.5×10^{10} neutrons/cm ² /second		
Operating Voltage	800	Volts
Output Current	10^{-3}	Amperes
For Neutron Flux of 2.5×10^9 neutrons/cm ² /second		
Operating Voltage	300	Volts
Output Current	2×10^{-4}	Amperes

* The WL-7353 has passed military specifications MIL-S-901 for shock and BuShips 40T9 for vibration.

□ Guide to connections is shown on page 2. Saturation voltage varies with neutron flux as shown on page 3.

■ Value of compensating voltage is dependent on the gamma flux gradient on the tube.

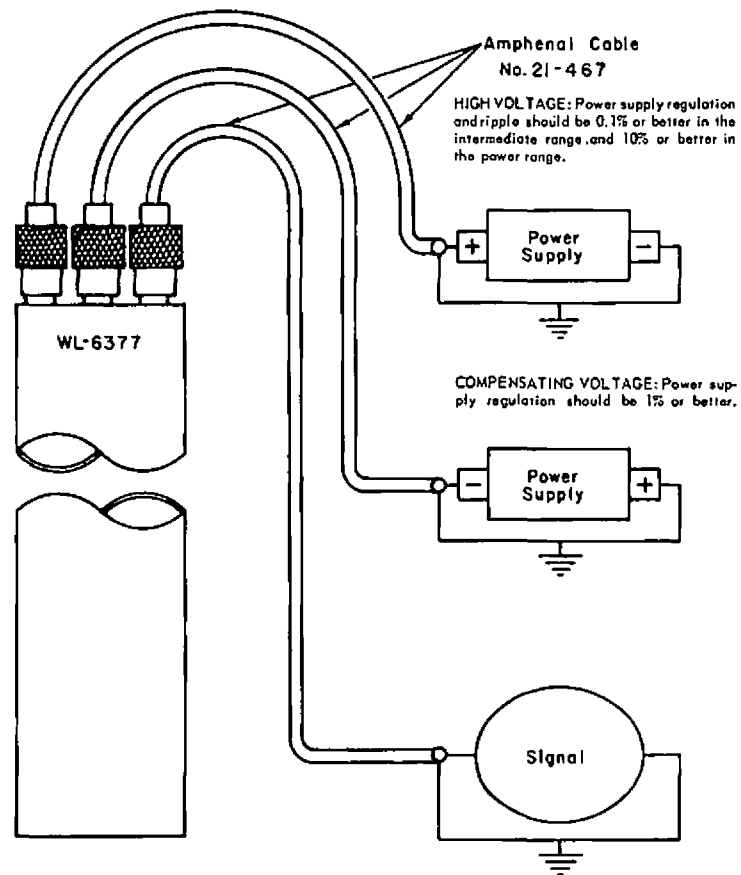
⊕ By varying the voltage on an electrode.

NOTE: This tube may not be immersed in water and high humidity environments should be avoided since they may impair performance.

Neutron & Radiation Detector Section

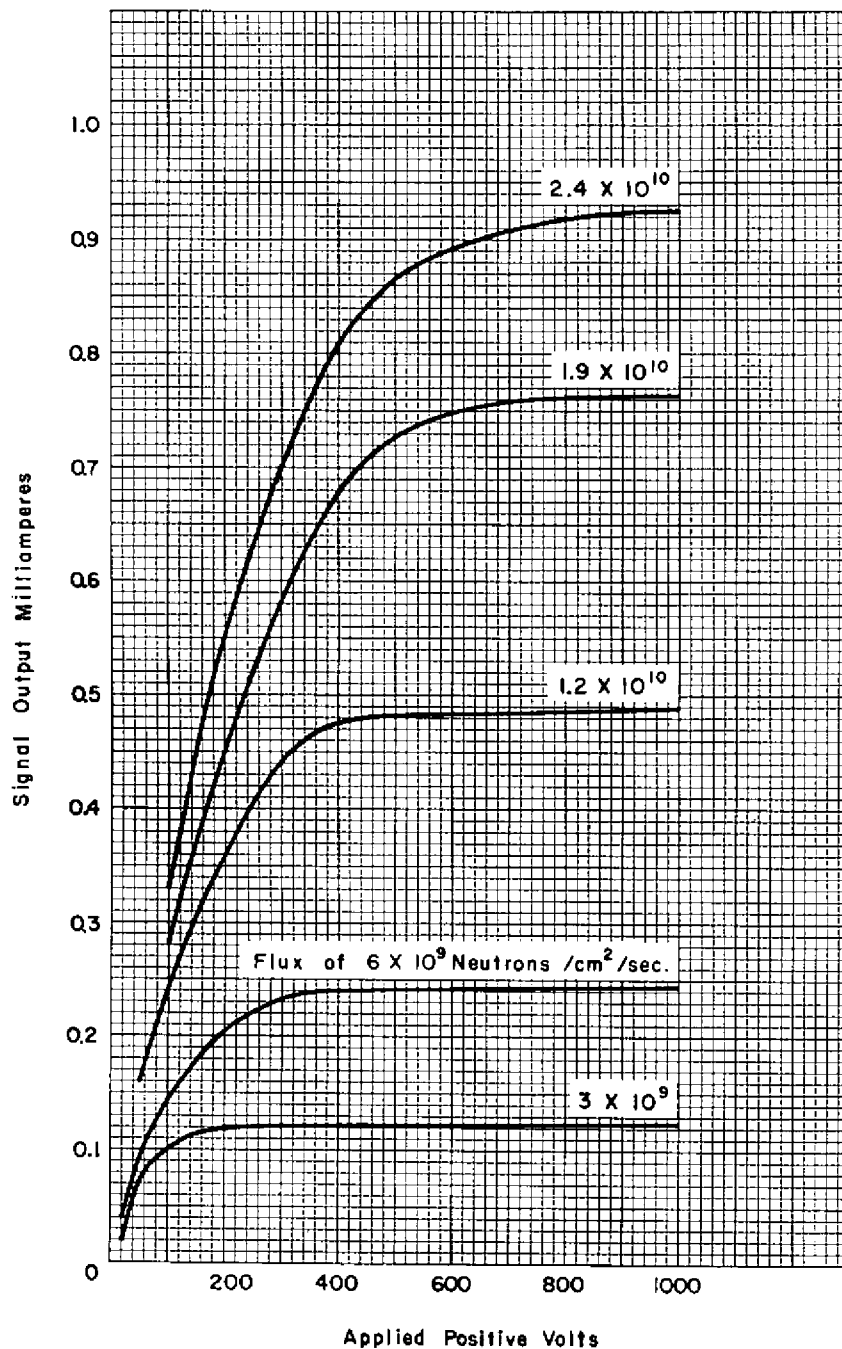
The WL-7353 is electrically similar to the WL-6377. The significant mechanical difference is that the WL-7353 has an extended portion with a tapped hole to facilitate mounting.

TYPICAL CONNECTION DIAGRAM



CE-A1324

TYPICAL SATURATION CHARACTERISTICS



CE-A1264 R1