July 1, 1962

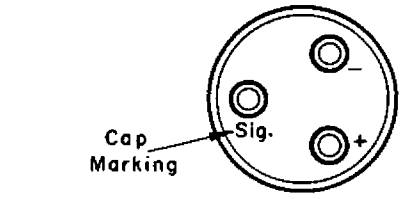
COMPENSATED IONIZATION CHAMBER TYPE WL-8214

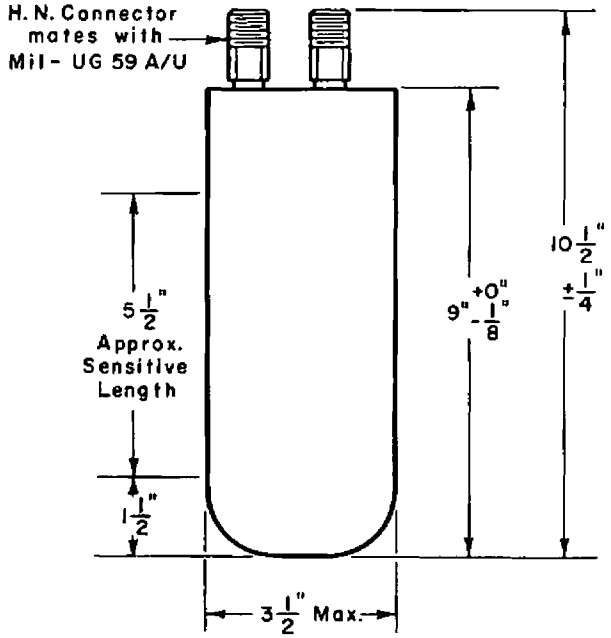
The WL-8214 ionization chamber is designed to detect thermal neutrons in the presence of relatively high gamma radiation fields when varying strength or a high gradient of the field is encountered. The chamber is a variable, electrically compensated type and should find wide application in high power facilities and in research institutions. The guard-ring design employs stabilized polystyrene to reduce electrical leakage and minimize spurious signals. The chamber is constructed of high purity aluminum in the electrodes, case, and major support structures to minimize handling problems and shift in compensation due to activation.

The thermal neutron sensitivity of the WL-8214 is approximately 2×10^{-14} amperes/neutron/cm^2/second. The gamma sensitivity is approximately 5×10^{-12} amperes/R/hr (uncompensated), and a reduction of this sensitivity by a factor of 100 may easily be achieved.

MECHANICAL

Maximum Diameter	3-1/2	Inches
Maximum Over-all Length	10-3/4	Inches
Approximate Sensitive Length	5-1/2	Inches
Net Weight	4	Pounds
Shipping Weight	12	Pounds





MATERIALS

Outer Case	Aluminum
Electrodes	Aluminum
Insulation	Stabilized Polystyrene
Neutron-Sensitive Material:	
Content	Boron Enriched in B-10
Thickness	1 mg/cm^2
Gas Filling	Nitrogen

IMPEDANCE

Resistance: (Note 1)		
Signal-to-case, minimum	10^{13}	Ohms
H.V.-to-case, minimum	10^{12}	Ohms
Compensating-to-case, minimum	10^{12}	Ohms
Capacitance: (Note 2)		
Signal-to-case, Approx.	135	$\mu\mu$f
H.V.-to-case, Approx.	140	$\mu\mu$f
Compensating-to-case, Approx.	80	$\mu\mu$f

MAXIMUM RATINGS

Voltage Between Electrodes, (d-c)	1000	Volts
Temperature	175	°F
External Pressure (Note 3)	180	PSI
Thermal Neutron Flux	5×10^{11}	nv

TYPICAL OPERATION

Typical Connections	See Figure 1	
Operating Voltage	300 to 800	Volts
Saturation characteristics	See Figure 2	
Compensating Voltage	See Figure 3	
Thermal Neutron Flux Range	2.5×10^{2} to 2.5×10^{10}	nv
Thermal Neutron Sensitivity	2×10^{-14}	Amperes/nv
Gamma Sensitivity:		
Uncompensated	5×10^{-12}	Amperes/R/hr
Total Compensation	Zero	

NOTES

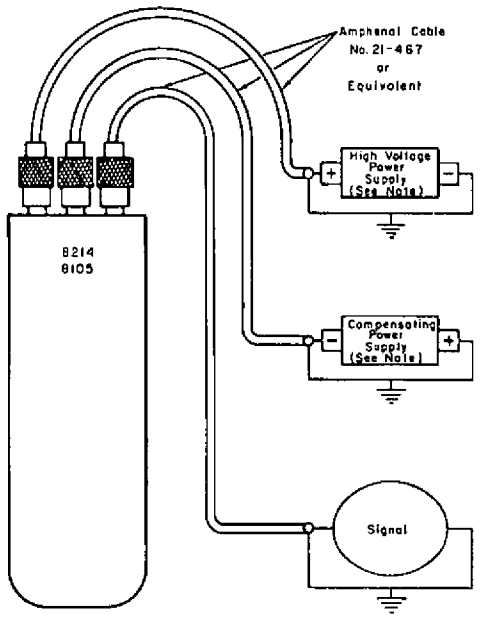
1. The detector may not be immersed directly in water and high humidity environments should be avoided.
2. Capacitance is measured between an electrode and the case, with all other electrodes grounded to the case.
3. The pressurizing atmosphere must be dry and non-corrosive.

PRINTED IN U.S.A.

Neutron & Radiation Detector Section

WESTINGHOUSE ELECTRIC CORPORATION, ELECTRONIC TUBE DIVISION, ELMIRA, NEW YORK

TYPICAL CONNECTION DIAGRAM



Note: Permissible power supply regulation and ripple will depend upon the particular application. See Section entitled "Ionization Chamber Operation."

CE-A1782

FIGURE 1

TYPICAL SATURATION CHARACTERISTICS

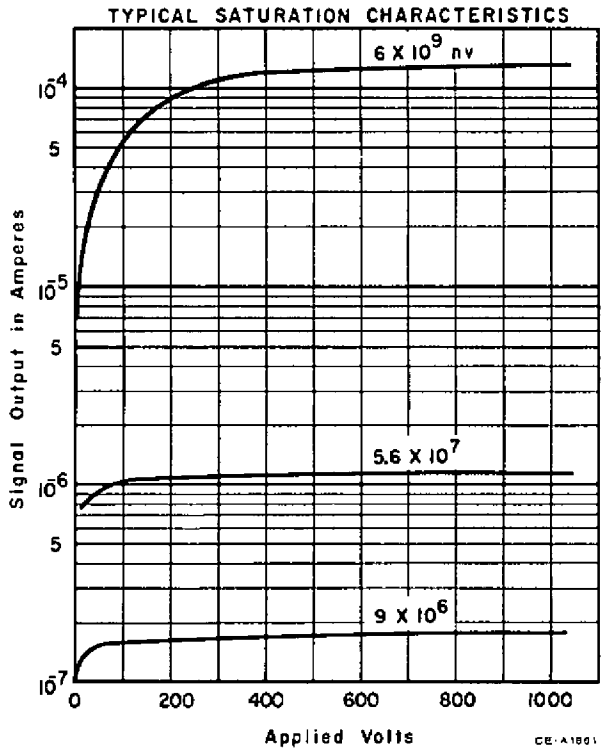


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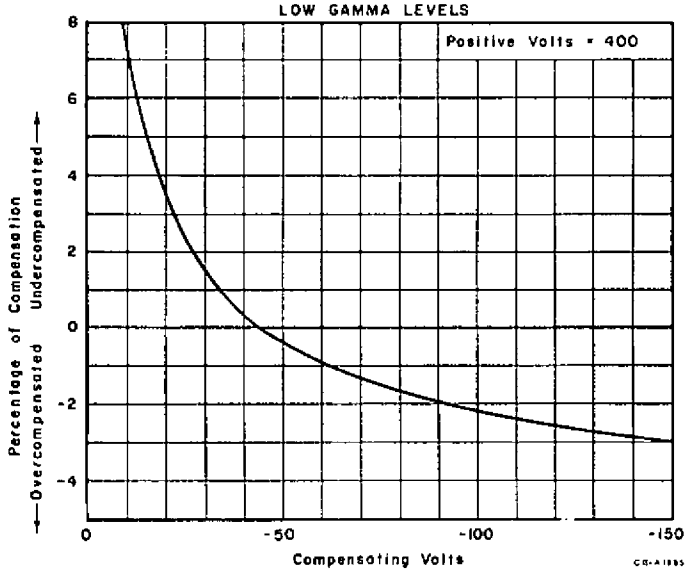
FIGURE 2

TYPICAL COMPENSATION CHARACTERISTIC
AT
LOW GAMMA LEVELS



CE-A1885

FIGURE 3

from JEDEC release #3822A, April 19, 1965

0573
3822A
4-19-65

Westinghouse Electric Corporation

Electronic Tube Division Box 284, Elmira, New York

April 2, 1965

* Mr. G. F. Hohn, Manager
EIA Engineering Laboratories
32 Green Street
Newark 2, New Jersey

Dear Mr. Hohn:

The following proposed re-registrations are hereby requested.

ITEM	AS REGISTERED	AS PROPOSED
Tube Type:	8073	
Rel. No.	3310	
Under Mat'ls:		
Neut. Sens. Mat'l.		
Total Quantity	1.72 Grams	1.68 Grams
Tube Types:	8105 8137 8214	
Ret. No.	3476 3522 3822	
Under TYP-OPER.		
Gamma Sens. (8137 only)	5×10^{-12} A/R/hr.	3.5×10^{-12} A/R/hr.
Un-Comp.	5×10^{-12} A/R/hr.	3.5×10^{-12} A/R/hr.

Thank you.

Very truly yours,

J. A. Scott
Commercial Engineering

JAS/cb