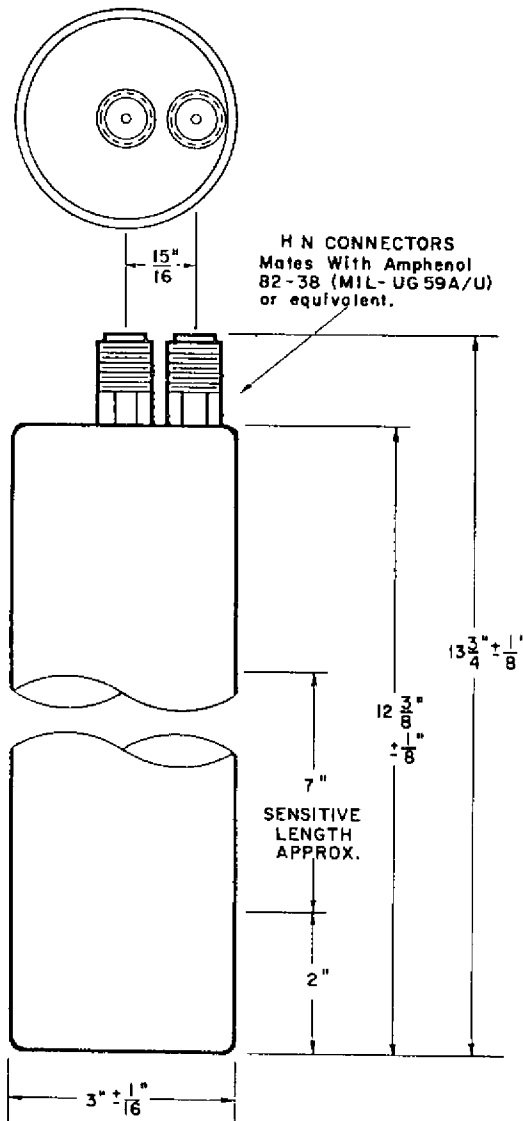


## UNCOMPENSATED IONIZATION CHAMBER TYPE 8075

The 8075 is a guard-ring ionization chamber designed to detect thermal neutrons in the range from  $2.5 \times 10^3$  to  $2.5 \times 10^{10}$  neutrons/cm<sup>2</sup>/second. The guard-ring construction combined with the use of high-purity alumina ceramics provides a design which minimizes leakage currents usually detrimental to low current operation. The detector is extremely rugged and the high alumina insulation used throughout permits operation to 300°F and minimized deterioration due to radiation damage.

The rugged construction makes the detector especially useful for Intermediate and Power range reactor instrumentations where mechanical shock and vibration present problems. The internal design provides a relatively high thermal neutron sensitivity of about  $4.4 \times 10^{-14}$  amperes/neutron/cm<sup>2</sup>/second in a compact device. The gamma sensitivity is approximately  $5 \times 10^{-11}$  amperes/R/hour.



### MECHANICAL:

Maximum Diameter . . . . .	3-1/16	Inches
Maximum Overall Length . . . . .	13-7/8	Inches
Approximate Sensitive Length . . . . .	7	Inches
Net Weight . . . . .	2-1/2	Pounds
Shipping Weight . . . . .	10	Pounds

### MATERIALS:

Outer Case . . . . .	Aluminum
Electrodes . . . . .	Aluminum
Insulation . . . . .	Alumina Ceramic
Neutron Sensitive Material . . . . .	Boron Enriched to 96% in B-10
Gas Filling . . . . .	Argon-Nitrogen Mixture

### IMPEDANCE:

Resistance:		
Signal Electrode to Case (minimum) . . . . .	$10^{11}$	Ohms
H.V. Electrode to Case (minimum) . . . . .	$10^{11}$	Ohms
Capacity:		
Signal Electrode to Case (Note 3) . . . . .	250	$\mu\text{mf}$
H.V. Electrode to Case (Note 4) . . . . .	170	$\mu\text{mf}$

### MAXIMUM RATINGS:

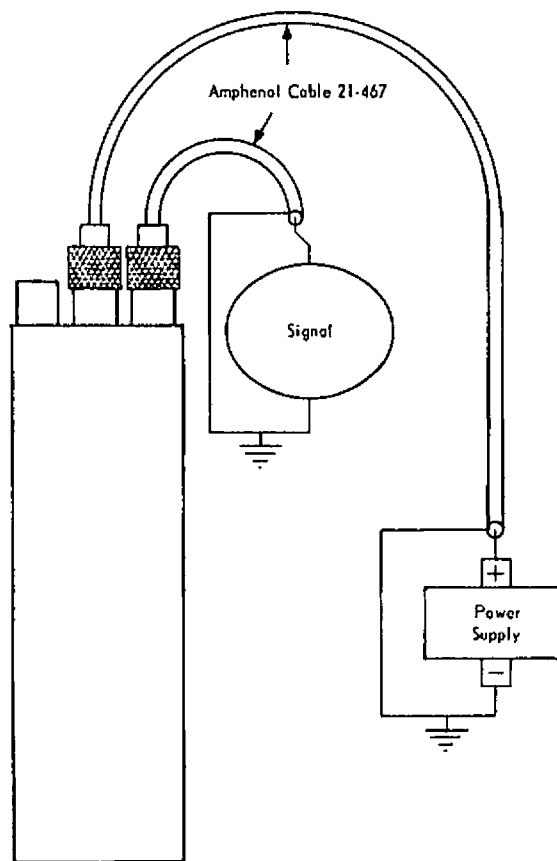
Voltage Between Electrodes . . . . .	1500	Volts
Temperature . . . . .	300	°F
External Pressure (Note 2) . . . . .	180	Pounds/Inch <sup>2</sup>
Thermal Neutron Flux . . . . .	$10^{11}$	nv

### TYPICAL OPERATION:

Operating Voltage (Note 1) . . . . .	200 to 1000	Volts
Saturation Characteristics . . . . .	Figure 2	
Thermal Neutron Flux		
Range . . . . .	$2.5 \times 10^3$ to $2.5 \times 10^{10}$	nv
Thermal Neutron Sensitivity (Approx.) . . . . .	$4.4 \times 10^{-14}$	Amperes/nv
Gamma Sensitivity (Approx.) . . . . .	$5 \times 10^{-11}$	Amperes/R/hr

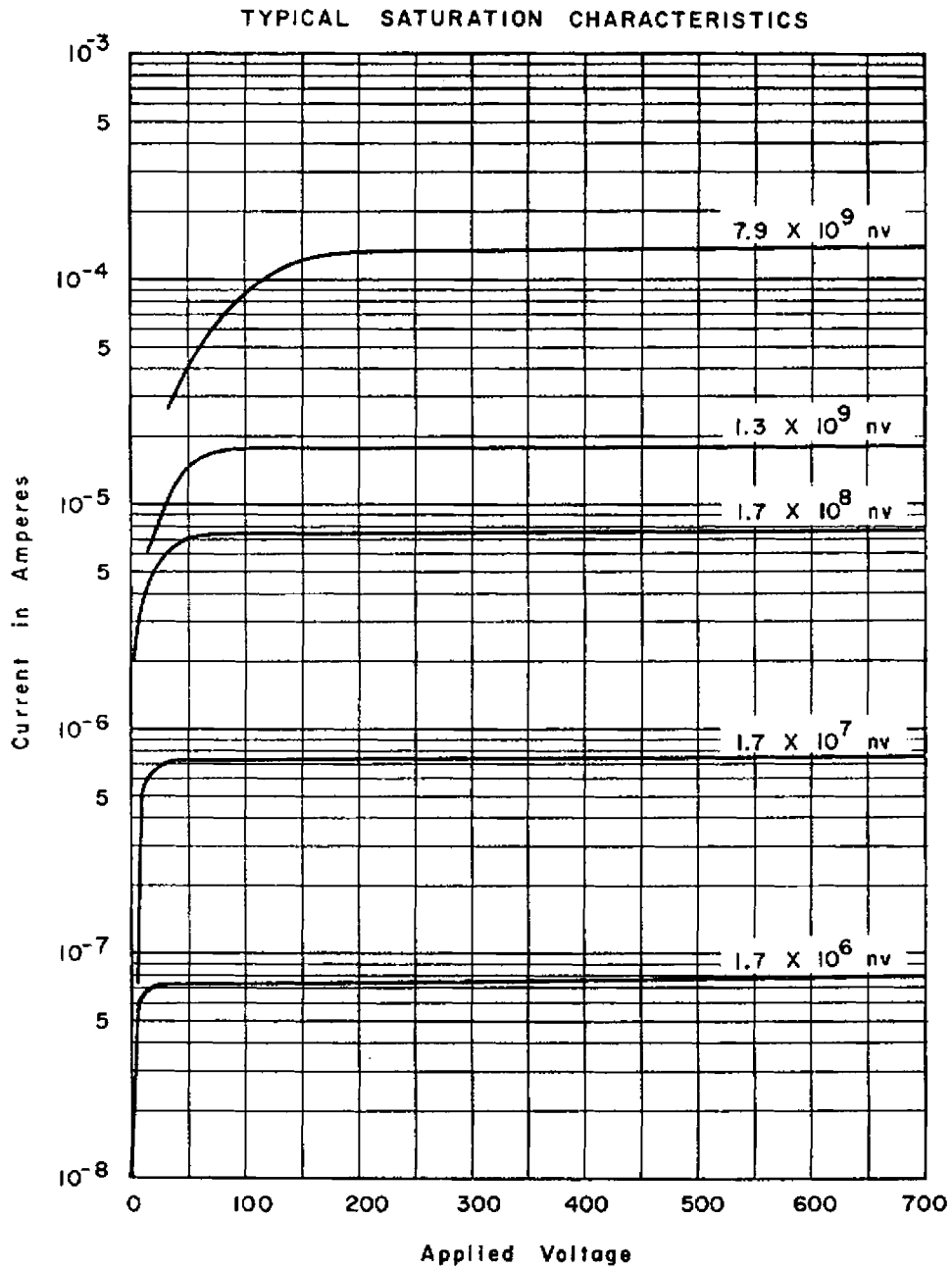
1. The voltage necessary to produce saturation varies with the neutron flux level. Either polarity may be used. See Figure 2.
2. The pressurizing atmosphere must be dry and non-corrosive.
3. With H.V. electrode grounded to case.
4. With signal electrode grounded to case.

TYPICAL CONNECTION DIAGRAM



CE-A1293

FIGURE 1



CE-A1292 R1

FIGURE 2