

WESTINGHOUSE ELECTRONIC TUBE DIVISION

Sales Department: Elmira, New York

WL-6376

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August 1, 1955

Westinghouse RELIATRON[®] Tube
WL-6376
Fission Counter Tube

The WL-6376 is a pulse ionization chamber for the detection of thermal neutrons by means of the ionization pulses produced in the gas atmosphere of the counter by fission fragments.

The detecting material is uranium oxides enriched in U-235 isotope coated on aluminum electrodes. The counter tube has an all-aluminum body two inches in diameter and it is 11-7/8 inches long; it is provided with a connector for "HN" cable fittings. The WL-6376 is extremely rugged and will operate at temperatures up to 80° C. It is filled to a pressure of one atmosphere with a nitrogen-argon mixture. The sensitivity is approximately 0.7 count per neutron/cm² when the background counting rate for the naturally radioactive uranium is 5.0 counts per second. The counter operates up to 10⁵ counts per second, and it will operate with no sensitivity loss up to this rate in the presence of 10¹⁰ X-rays/cm²-sec.

GENERAL DATA

Mechanical:

Overall Length	11-7/8" max.
Diameter	2-1/32" max.
Sensitive Length	6"
Insulating Materials	Polystyrene & Alumina
Body Material	Aluminum

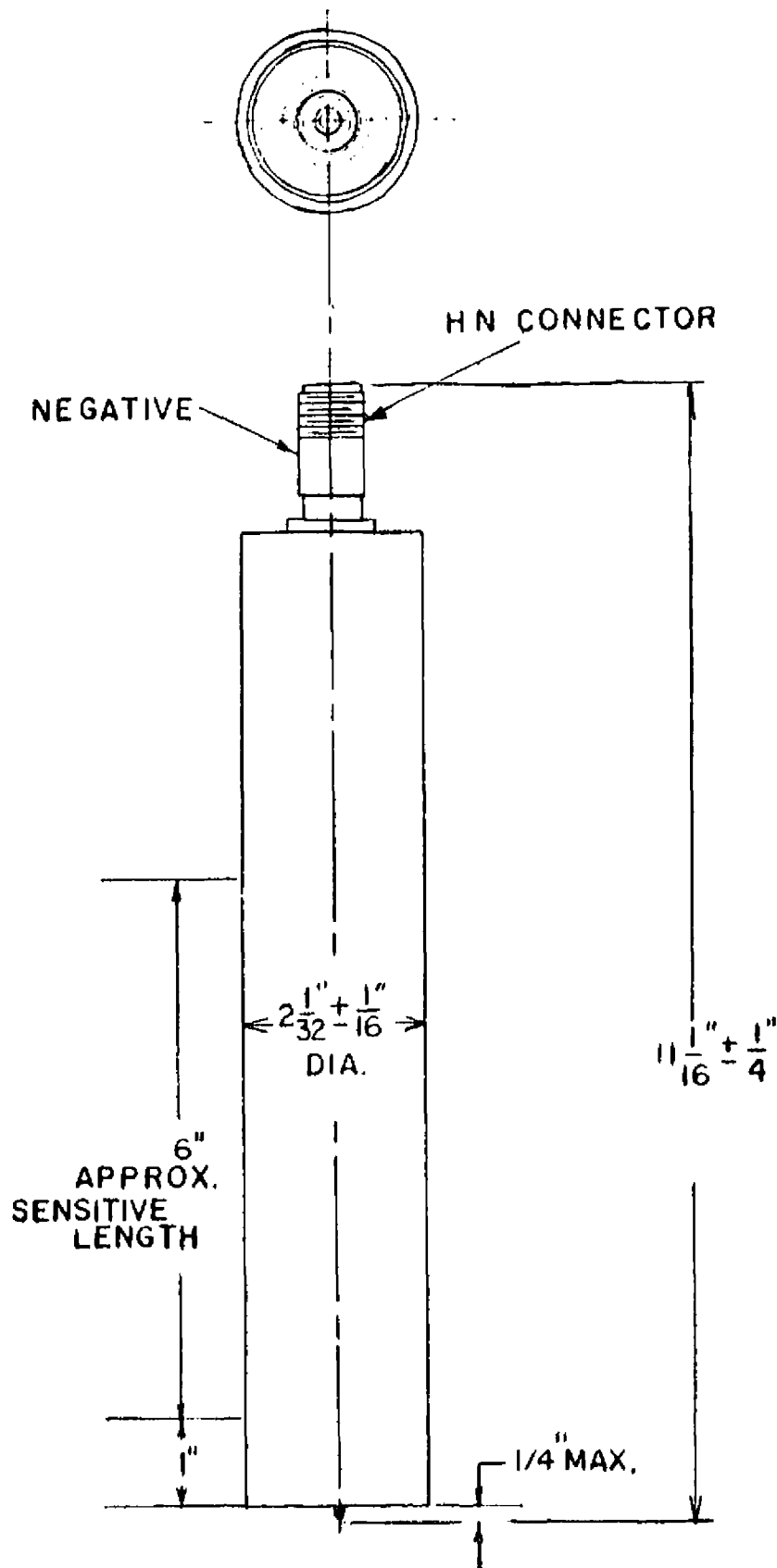
Operational:

Operating Voltage, approx.	300 Volts
Operating Temperature	80 °C
Operating Voltage Plateau	200 - 800 Volts

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The 6376 and 6377 detectors have been qualified as meeting requirements of MIL-STD-167, Mechanical Vibrations of Shipboard Equipment. As defined in Section 1.3 of the specification, all detectors are classified as Type 1, equipment intended for shipboard use which may be capable of withstanding the environmental conditions which may be encountered aboard Naval vessels. The equipment to be used is optional with the manufacturer, providing it meets the conditional requirements for amplitude and frequency defined in the specification. The test procedure calls for an Exploratory Test to determine resonance frequencies, if any; a variable frequency test; and an endurance test. In each of the tests, the detectors must be vibrated in each of the three principal directions of vibration.

Exploratory vibration is conducted at an amplitude of 0.010 inches from 5 to 33 cps in 1 cps steps, remaining 15 seconds at each step.

The variable frequency test is conducted from 5 to 33 cps in 1 cps steps of 5 min. duration. The amplitude shall be 0.030 inches in the 5 - 15 cps range, 0.020 in the 16 - 25 range, and 0.010 in the 26 - 33 range.

The endurance test is run at the resonant frequencies determined in the exploratory test, or if none, at 33 cps for two hours in each position. The amplitude will be determined by the frequency of vibration as in the variable frequency test.

Acceptance is based upon satisfactory electrical and nuclear operation upon completion of the endurance test and ability to perform as indicated by noise generation measurement during the variable frequency and endurance tests.

The 6376 and 6377 detectors have been qualified as meeting the requirements of MIL-S-901, Shockproof Equipment, class HI (High Impact), shipboard application, tests for. As defined in Section 3.1.2 of the specification, all detectors are tested as type C which means that they are considered individual devices. For the purpose of test, the detectors are classified by weight and all detectors fall into the light category (250 pounds and below) per Section 1.2.1 Tests on equipment falling into the above-defined classes are tested on a lightweight shock-testing machine (BUSHIPS Drawing 10-T-2145-L) utilizing a 400 pound hammer. In the tests the detectors are subjected to three blows parallel to each of the three principal axes, the three blows for each direction to be with heights of hammer drop of one foot, three feet, and five feet. This gives a total of nine blows of the hammer. The degree of acceleration is determined by the characteristics of the equipment.

The prime criteria for acceptance is the ability to perform during or after the test; however, none of the parts shall become detached from the apparatus.