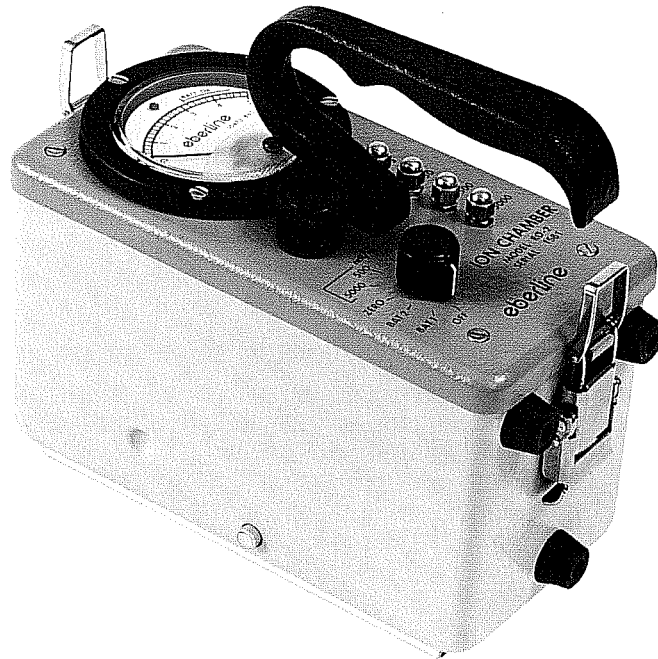


Ionization Chambers

Models RO-2 and RO-2A



Model RO-2
NATO Stock No.
6665-99-539-4312

- MEASURES GAMMA OR X-RAY EXPOSURE RATE AND BETA ABSORBED DOSE RATE
- MOST POPULAR ION CHAMBER SURVEY INSTRUMENT FOR NUCLEAR POWER PLANTS

Eberline

A DIVISION OF
 **Thermo
Electron**
CORPORATION

**RO-2,
RO-2A**

Models RO-2 and RO-2A, Ionization Chambers

GENERAL DESCRIPTION

The Model RO-2 is a portable air ionization chamber instrument used to detect beta, gamma, and x-ray radiation with four linear ranges of operation from 5 to 5000 mR/h full scale. The RO-2A has four linear ranges from 50 mR/h to 50 R/h full scale. The ionization chamber is vented to atmospheric pressure and is specifically designed to have a flat energy response (within ± 20 percent) from 12 keV to 7 MeV. Each instrument is factory

calibrated to gamma radiation. A single rotary switch turns the instrument off, checks the batteries, checks the zero setting, and selects the range of operation. The RO-2 has been adopted for exposure rate and absorbed dose rate (beta) surveys in many countries and has been assigned NATO Stock Number 6665-99-539-4312.

DETECTORS

The RO-2 detector is an air-filled ionization chamber vented to atmospheric pressure. It has a diameter of 3 in. (7.6 cm), and a volume of 208 cm³. The detector has 200 mg/cm² phenolic walls inside a 0.05 in. (1.3 mm) aluminum wall case. The sliding beta shield is 400 mg/cm² phenolic on the bottom of the case with a positive friction lock. The window is 7 mg/cm² Mylar.

ENERGY RESPONSE

Testing in the United States and the United Kingdom¹ indicates that the photon exposure response is within ± 20 percent of the ¹³⁷Cs gamma response from 12 keV to 7 MeV. Typical response curves for photons and beta radiation are shown on the following page. These data were obtained from the RO-2 and RO-2A.

RANGES

Four linear ranges:

RO-2: 0-5, 0-50, 0-500, 0-5000 mR/h

RO-2A: 0-50, 0-500 mR/h, 0-5, 0-50 R/h

Meter: Rugged, sealed, 2.38 in. (6 cm) scale length, two percent accuracy. Linear markings from zero to five in 25 minor increments.

Response Time: 5 seconds, 0-90 percent of final reading.

Linearity: Within ± 5 percent of full scale.

Controls: Switch with *OFF*, battery (*BATT*) check, *ZERO* check, and range selection position. The *ZERO* knob is used to set the meter when the switch is at the zero position. The calibration controls are external. There is one for each range.

BATTERIES

Type: NEDA 1604, 9 V batteries. Three are used in the RO-2, and four are used in the RO-2A.

Life: Approximately 200 hours C-Zn, 330 hours alkaline or mercury.

ENVIRONMENTAL

Temperature: Operable from -40°F to $+140^{\circ}\text{F}$ (-40°C to $+60^{\circ}\text{C}$). Operation at low temperatures may be limited by battery performance.

Seals are used at openings for dust and water resistance.

RF Sensitivity: Reading of the RO-2 or RO-2A is unaffected by pulsed or continuous radar fields up to 20 mW/cm².

SPECIFICATIONS

Weight: 3 lbs. (1.72 kg)

Size: 3.9 in. wide x 8.3 in. long x 7.9 in. high (10 cm x 21.1 cm x 18.9 cm), including handle

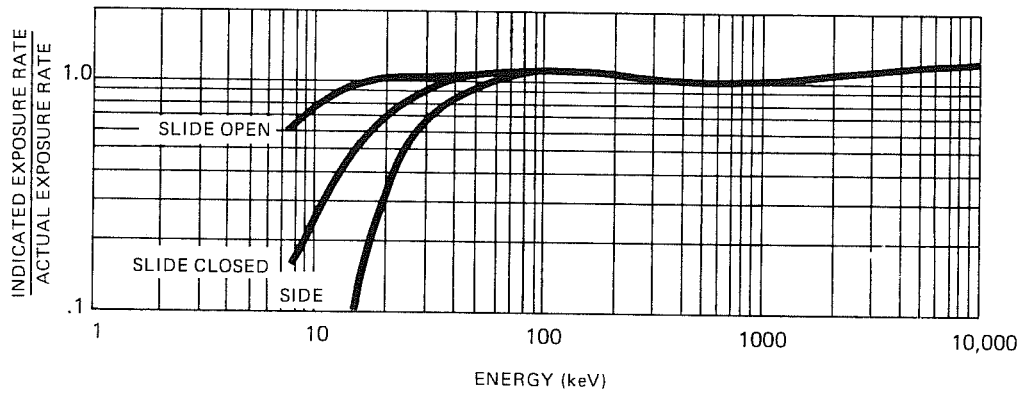
AVAILABLE ACCESSORIES

Radioactive Source: CS-7A ¹³⁷Cs gamma check source

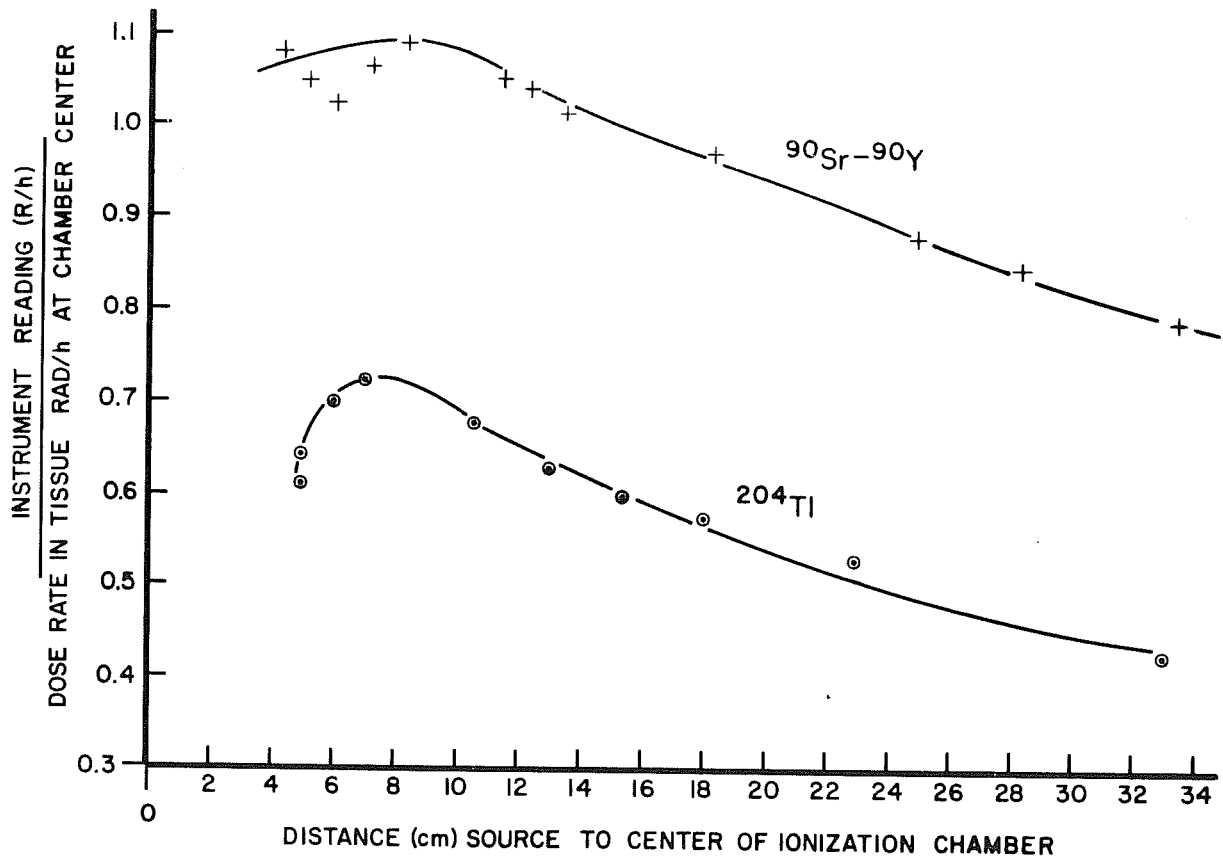
Carrying Strap: Model ZP10125099

¹ I.M.G. Thompson of Central Electricity Generating Board, United Kingdom, "International Standard Reference Radiations and Their Application to Type Testing of Dosimetric Apparatus", "Report IAEA-SM-222/24, IAEA Symposium on National and International Standardization Radiation Dosimetry", December 5-9, 1977.

Models RO-2 and RO-2A, Ionization Chambers



TYPICAL PHOTON ENERGY RESPONSE, MODELS RO-2 AND RO-2A



TYPICAL BETA RESPONSE OF MODELS RO-2 AND RO-2A