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

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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°F (−40°C to +60°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

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**