

The Model RO-20 is a portable air ionization chamber instrument, used to detect beta, gamma, and x-radiation, with five linear ranges of operation to measure exposure from background to 50 R/h full scale.

RO-20 Ion Chamber Survey Meter



Measures gamma or x-ray exposure rate

Temperature compensated measurements

Sliding shield for beta measurements

Large, backlit display

5 ranges up to 50 R/h

Extended battery life

Non-mechanical range switching



The ionization chamber is vented to atmospheric pressure and is specifically designed to have a flat energy response into the x-ray region. The detector is fully temperature compensated, eliminating any need for temperature correction. 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. An ergonomically located switch illuminates the meter. Internal switching of ranges is accomplished with reed relays, eliminating the mechanical swing arms typically used with portable ion chamber survey instruments.

Detector

The RO-20 detector is an air-filled ionization chamber. It has a diameter of 7.32 cm (2.88") and a volume of 220 cm³ (13.4 in³). The detector has 640 mg/cm² phenolic walls inside a 1.6 mm (0.063") aluminum wall case for a total thickness of approximately 1,000 mg/cm². A 7.9 mm (5/16") thick phenolic sliding beta shield with a positive friction lock is mounted on the bottom of the chamber. The shield thickness is approximately 1,000 mg/cm². The chamber window is comprised of two layers (one on the chamber, one on the can) 25 micron (0.001") mylar, approximately 7 mg/cm² total.

Energy Response

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| Photon Response: | Reference to ¹³⁷ Cs measured through the bottom with the slide closed, the energy response is: ± 30% from 8 keV to 1.3 MeV with the open slide facing the source. ± 15% from 33 keV to 1.3 MeV with the closed slide facing the source. ± 15% from 55 keV to 1.3 MeV through the side of the instrument. |
| Beta Response: | Uranium Slab: 30% of true mrad/h field behind 7 mg/cm ² window with RO-20 resting on slab, slide open. ⁹⁰ Sr ⁹⁰ Y: Approximately 93% of true mrad/h field at 30 cm with slide open. |
| Fast Neutron Response (PuBe): | Reads approximately 8% in mR/h of true neutron field in mrem/h. |

Radiological

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| Radiation Detected: | Beta, gamma, and x-ray. |
| Ranges: | Five linear ranges: 0-5, 0-50, 0-500 mR/h and 0-5, 0-50 R/h. |
| Meter: | Scale length, approx. 7.6 cm (3"), 2% accuracy. Linear markings from 0 to 5 in 50 minor increments. The meter is back-lit. |
| Response Time: | 90% of final reading within 5 seconds; see options below for faster response. |
| Linearity: | Within ± 5% of full scale. |
| Battery Dependence: | Reading is independent of battery voltage when the battery check indication is in the green arc. |
| External Controls: | Range switch, including Off, Zero, and Battery checking positions. Zero knob used to set meter to zero when Zero position of range switch is selected or when in no significant radiation field. Light switch, for meter light. |
| Internal Controls: | Five calibration controls, one for each range. |
| Batteries: | Main power: Five "C" cells. |
| Chamber Bias: | Ten 3 volt lithium coin cells, 30 volts. |
| Battery Life: | "C" cells, widely variable according to RO-20 usage and battery type. Typical ZnC: mR/h ranges, 2900 hrs. All other ranges, 150 hrs. Typical Alkaline: mR/h ranges, 6900 hrs. All other positions, 350 hrs. Frequent or continuous use of the light will reduce battery life significantly. Thirty volt chamber bias battery life: Totally dependent upon the usage of "Battery 2" position of the range switch. The battery capacity should allow for at least 50,000 five second battery checks. The battery drain is negligible on all other positions of the range switch |
| Temperature: | Operable from -40 °C to 60 °C (-40 °F to 140 °F). For operation below -18 °C (0 °F), alkaline or nickel-cadmium "C" cells should be used. |
| Temperature Compensation: | The detector is fully compensated over the operational temperature range for output accuracy within 10% ± 0.5 mR/h. |
| Moisture: | Seals used at openings for dust and water resistance. Detector is protected by a silica-gel dryer. |
| Humidity: | Operable from 0 to 95%, non-condensing |
| Weight: | Approximately 3.6 pounds (1.63 kg) with alkaline C cells. |
| Size: | 201 L x 107 W x 196 H mm (7.9" L x 4.2" W x 7.7" H), including handle. |
| Testing: | The RO-20 has been successfully tested to ANSI N42.17A and is CE Certified to European standard EN50082-1 (EN61000-4-2 & EN61000-4-3). |
| Options: | ¹³⁷ Cs gamma check source: CS-7A Carrying strap: ZP11466031 |

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