

The Model RO-20 AA 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 AA 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
- Non-mechanical range switching
- Easy to exchange standard batteries



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.

Compared to the previous model RO-20, only standard batteries are used and the exchange of all batteries can be accomplished very quickly and easily. The total weight of the instrument is reduced by 10 % and the angular response is improved in the horizontal plane by up to 20 % under 180°.



## Detector

The RO-20 AA detector is an air-filled ionization chamber. It has a diameter of 7.32 cm (2.88") and a volume of 220 cm<sup>3</sup> (13.4 in<sup>3</sup>). The detector has 640 mg/cm<sup>2</sup> phenolic walls inside a 1.6 mm (0.063") aluminum wall case for a total thickness of approximately 1,000 mg/cm<sup>2</sup>. 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/cm<sup>2</sup>. The chamber window is comprised of two layers (one on the chamber, one on the can) 25 micron (0.001") mylar, approximately 7 mg/cm<sup>2</sup> total.

## Energy Response

Photon Response:	Reference to <sup>137</sup> 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 <sup>2</sup> window with RO-20 AA resting on slab, slide open. <sup>90</sup> Sr/ <sup>90</sup> 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

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.
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. Light switch, for meter light.
Internal Controls:	Five calibration controls, one for each range.
Batteries:	Main power: Five "AA" cells.
Chamber Bias:	Three 12 volt standard "23A" alkaline cells, 36 volts.
Battery Life:	"AA" cells, widely variable according to RO-20 AA usage. Typical Alkaline: mR/h ranges, 2500 hrs. All other positions, 125 hrs. Frequent or continuous use of the light will reduce battery life significantly. 36 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).
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 3.3 pounds (1.47 kg) with alkaline AA 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 AA has been successfully tested to ANSI N42.17A
Options:	<sup>137</sup> Cs gamma check source: CS-7A Carrying strap: ZP11466031

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