

HIGH RANGE AREA DETECTOR

MODEL RD-8



The RD-8 detector assembly is a special-purpose gamma flux detector for use in high range gamma fields up to 10^9 mR/h.

THEORY OF OPERATION

The model RD-8 utilizes an ionization chamber. Gamma photons strike the detector and form ion pairs in the filler gas of the detector. These ion pairs are collected and integrated by an external circuit forming a current with absorbed dose. The output current is conducted to the signal processor over the coaxial cable. The assembly has an energy compensation filter to provide near linear energy response.

Saturation

At radiation levels above the range of the detector, the ion chamber no longer continues to increase output current linearly with absorbed dose. Instead, the output current reaches a maximum value and remains at the level until the gamma flux intensity diminishes to a level back in the operating range of the unit.

Performance

Energy dependence is $\pm 15\%$ over a range of 100 keV to 2.5 MeV; output currently is nominally 7×10^{-10} A/R/h; maximum operating temperature is 300°F; maximum operating humidity is 100%; and maximum operating pressure is 60 psi.

Checksource

A checksource actuation on a monitor using the RD-8 detector results in a current source being applied to the signal processor's input. This current source simulates the RD-8's output and provides a two-decade range response.

RD-8 HIGH RANGE AREA DETECTOR

SPECIFICATIONS

Range: 10^1 to 10^9 mR/hr (RM-80 or RM-2000 Processor)
 10^1 to 10^8 mR/hr (RM-1000 Processor)
 10^1 to 10^7 mR/hr (RP-2A Processor)

Sensitivity: 7×10^{-10} A/R/h

Fill gas: Xenon

High-voltage input: 1800 VDC (RM-80 or RM-2000 Processor)
1000 VDC (RM-1000 Processor)
875 VDC (RP-2A Processor)

Connectors:

Signal: BNC

High Voltage: MHV

Operating Temperature: 39° to 300°F

Operating Humidity: 0% to 100%

Dimensions: 3.5 in. dia x 12.5 in. high; mounting bracket 5.0 in. wide x 4.0 in. high

Weight (approximate): 10 lb

Mounting: Mounting bracket for wall or frame bolting