



Trusted
radiation
protection.

940-702

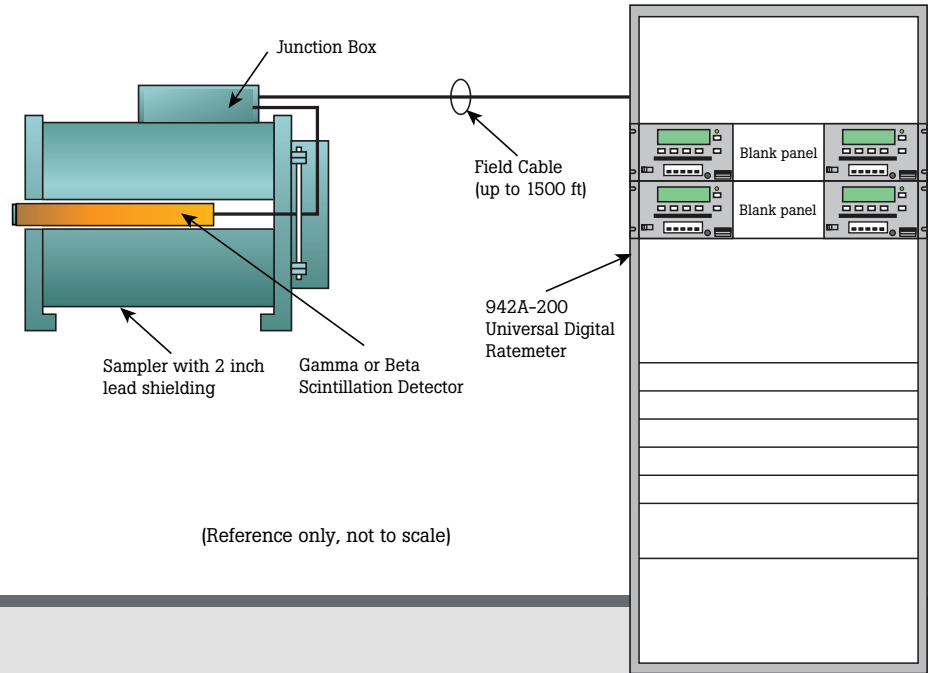
Shielded Duct Monitor

The 940-702 Shielded Duct Monitor is designed to provide a direct measurement of the noble gas activity in a ventilation duct or exhaust duct in low background areas. For some applications, the direct, in-line measurement using the 940-702, is a cost-effective alternative to withdrawing a sample of the effluent and measuring the radioactivity using an off-line monitor. For a nominal 12-by-12-inch duct, gaseous effluents with concentrations as low as $1 \times 10^{-7} \mu\text{Ci/cc}$ may be detected.

The 940-702 Shielded Duct Monitor, when used with the 943-25T Beta or 943-36 Gamma Scintillation Detector and a 942A Universal Digital Ratemeter (UDR) or 960 Digital Radiation Processor Controller, provides a radiation monitoring system for applications where the direct measurement

of the radioactivity in a duct is needed. The 940-702 is a duct-mounted single-channel detector shield suitable for the monitoring of airborne effluents for noble gasses. The sampler is a shielded mounting fixture that provides a fixed sampling geometry for the detector. Since the active volume is fixed, the noble gas concentration measured by the detector is independent of the duct flow rate.

The shield is manufactured using a 0.25-inch thick steel weldment, filled with two inches of virgin lead. The lead provides shielding of the detector from background radiation. The weldment retains the lead shielding and provides a stable mounting base for the detector. The detector is accessed for calibration or replacement via a hinged door located at the rear of the shield. The door is lead-filled to



Key features

- 2 inches of lead shielding
- Mounts directly into duct
- Hinged rear door for detector access
- For use with 943-25T Beta or 943-36 Gamma Scintillation Detectors
- ^{137}Cs check source installed in field junction box

minimize the induced ambient background radiation. The shield is designed for floor or platform mounting, and is bolted directly to the duct. The sensitive end of the detector protrudes approximately one inch from the gasketed shield, and is inserted directly into the duct. An o-ring sealed mounting flange prevents the effluent or ambient air from exiting or entering the duct. A junction box is mounted on the top of the shield, providing a waterproof enclosure for connecting the detector to the control room readout cable. The junction box also contains a solenoid-operated check source mechanism, which provides a method to verify detector operation from the control-room-readout.

Technical specifications

Volume

12 x 12 in rectangular duct (other sizes are available as a special order)

Shielding

2 inches, lead, including rear door

Detectors

943-25T Beta Scintillation, provided separately; or 943-36 Gamma Scintillation, provided separately

Efficiency

943-25T:

- 1.73×10^8 CPM/ μ Ci/cc, ^{85}Kr
- 4.58×10^7 CPM/ μ Ci/cc, ^{133}Xe

943-36:

- 2.58×10^6 CPM/ μ Ci/cc, ^{85}Kr
- 6.86×10^7 CPM/ μ Ci/cc, ^{133}Xe

Check source

8 μ Ci, ^{137}Cs , provided separately

Pressure limit

8 psig

Pressure seals

- Neoprene gasket between duct wall and shield
- O-ring seal between detector shell and mounting flange

Mounting

Four, 0.75 inch \varnothing holes

Lifting

1.0 inch lifting holes on each corner of the weldment

Power requirements

None

Environmental

- Operating temperature: 32 °F to 122 °F (0 to 50 °C)
- Storage temperature: 32 °F to 122 °F (0 to 50 °C)
- Relative humidity: 0 to 95 %, non-condensing

Dimensions (*w x d x h*)

11.75 in x 15.3 in x 18.25 in
(29.8 cm x 38.9 cm x 46.35 cm)

Weight

230 lb (104.5 kg), approx.

Model

940-702: Shielded Duct Monitor

Standard Accessories

942A: Universal Digital Ratemeter

844-211: Junction Box

943-36: Gamma Scintillation Detector

943-25T: Beta Scintillation Detector

960: Digital Radiation Processor Controller

Optional accessories

948-1: Rack Chassis



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