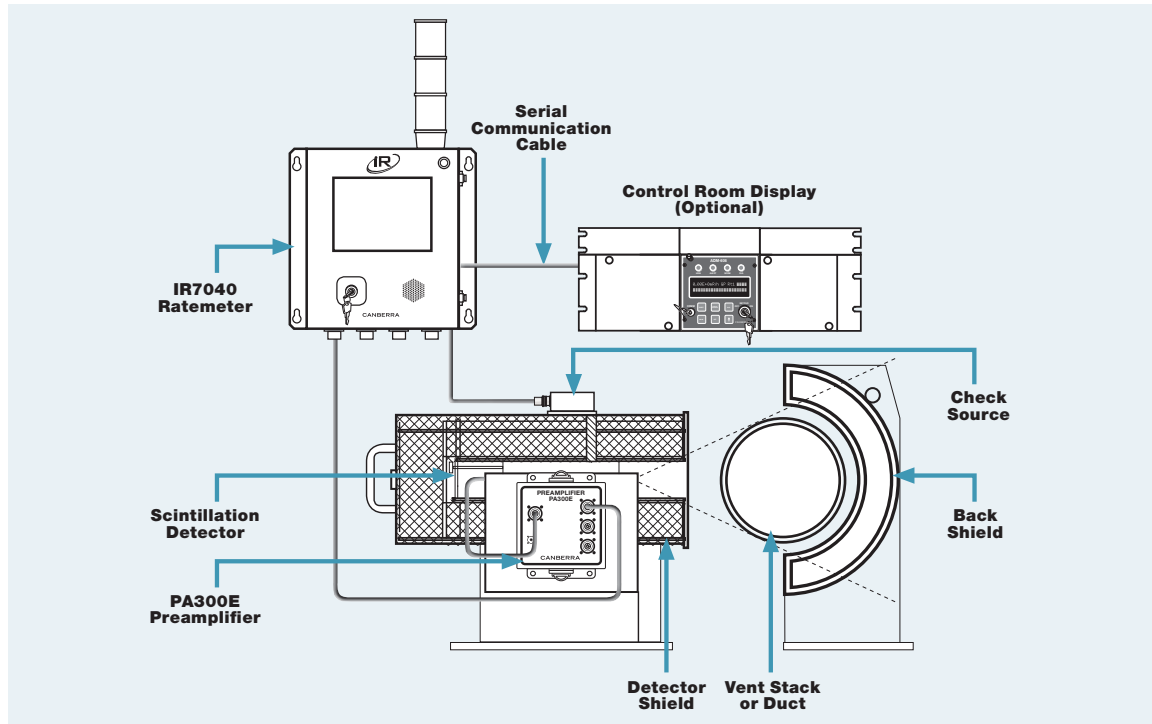




Hardened Containment Vent Radiation Monitoring System



FEATURES

- Performs continuous monitoring of radioactive gamma activity necessary to detect a potential release of radiation via the Hardened Containment Vent System (HCVS)
- Minimal power required to sustain system during Station Black Out (SBO)
- Accommodates all standard power inputs including +24 V dc
- iR7040 Ratemeter historical data provides detailed and independent records for retrospective event analysis
- On-line arrangement provides for simplified engineering and positioning of device as no stack penetration is needed
- Optional physics analysis available to characterize vent line for more accurate measurement
- Designed to meet the requirements of NRC Order EA-13-109

DESCRIPTION

CANBERRA's SafePoint Hardened Containment Vent Radiation Monitoring System continuously measures the quantity of radioactive gamma activity that is released from the operation of the Hardened Containment Venting System. The system is mounted external to the HCVS and therefore is not influenced by the extreme conditions within the duct and has no impact on stack flow. This same arrangement has been provided, and can be used, with non-hardened vents, filtered vents, and other normal range stack venting applications.

The system consists of the following main components:

- OLM100 On-Line Pipe Sampler with check source
- MD55EV1PA – MD series scintillation detector matched with a PA300E Preamplifier
- iR7040 Intelligent Ratemeter
- ADM606 Rack Mount Multi-Function Ratemeter for optional Control Room Indication

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The OLM100 On-Line Pipe Sampler consists of a 2π lead shield with the lead thickness designed to furnish the required sensitivity with a known background (normally 3 in. lead). A shadow shield or back shield is mounted on the other side of the pipe to provide an effective 4π shielding. The MX series Cs-137 check source is provided to check system operability.

The MD55EV1PA matched pair consists of an MD55EV1 scintillation detector mated and tested with a PA300E preamplifier. The MD55EV1 detector utilizes an LED-based gain stabilization technique that ensures stable measurements over a wide temperature range without the need for a radioactive seed. This sourceless technique improves measurement accuracy and can extend calibration cycles without requiring labor-intensive source tracking and inventorying activities associated with seeded detectors.

The iR7040 Intelligent Ratemeter provides visual and audible annunciation and powers and controls the detector and preamplifier mounted in OLM100 On-Line Pipe Sampler. The ratemeter also acquires and logs all related data including alarms, probe outputs, probe parameters, conditioned outputs, source check responses, and out-of-parameter conditions to its internal historical file for plotting and enhanced performance monitoring. The iR7040 can interface with an optional rack mounted ADM606 ratemeter if control room indication is desired.

GENERAL SPECIFICATIONS

- Typical energy range used for application: 0.2 – 2.5 MeV gross (LLD dependent on customer's pipe material and thickness)
- Sensitivity: varies by customer pipe size
- For 300 mm (12") diameter:
 - Sensitivity – Cs-137:
 $5.4E \times 10^{-5}$ cps/(Bq/m³)
 $[1.2 \times 10^8$ cpm/(μ Ci/cc)]
- For 300 mm (12") diameter:
 - Sensitivity – Co-60:
 1.5×10^{-4} cps/(Bq/m³)
 $[3.3 \times 10^8$ cpm/(μ Ci/cc)]
- Available measurement range:
 - 1.0×10^3 – 3.0×10^{13} Bq/m³
(2.7×10^{-8} – 8.1×10^2 μ Ci/cc)
- Typical measurement range:
 - 1.0×10^4 – 1.0×10^{12} Bq/m³
(2.7×10^{-7} – 2.7×10^1 μ Ci/cc)
- The Hardened Containment Vent Effluent Discharge Monitoring System is designed and manufactured under a quality system in compliance with the following standards and requirements:
 - ISO 9001
 - 10CFR21
 - NQA 1
- Other variants on this design are available to address local/regulatory requirements, very high or low temperatures and extended measurement ranges.

SYSTEM OPTIONS

- Seismic Qualification
- ISOCS™ Characterization of vent line for more accurate measurement and discharge calculation
- High range backup gamma area monitor
- High temperature scintillation detectors
- Weatherproof housing
- Alternate shielding options
- Alternate mounting options
- Optional battery backup



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