innovation in Radiation Monitor design

RAVEN compatible

Pedestrian Portal Monitors

PM-700AG

Gamma-Category III* pedestrian portal monitor

PM-700AGN

Gamma-Neutron-Category III* pedestrian portal monitor

Description

TSA's PM-700AG and PM-700AGN monitors are stand-alone pedestrian portal monitors with excellent sensitivity and reliability. Their large detectors and unique detection algorithm enhance their performance to the point that they can achieve ASTM Standard C 1169 Category III* sensitivity for SNM.

All of the essential components are contained in the pillars: radiation detectors, controller, and occupancy detector. The system operates from an internal battery. The battery is constantly charged from the site's ac line during normal operation. In the event of a power outage, the battery permits continued operation for at least 12 hours.

Model PM-700AGN adds neutron detection capability to the basic PM-700AG. Both models utilize TSA's model SC-770 system controller, and model SCA-775 amplifier/single channel analyzer.

The PM-700AG and PM-700AGN are equipped with RS-232 and Ethernet communications capability. A relay output is available for connection to TSA's AM-270 alarm monitor or other site security system. TSA's RAVEN (Radiation Alarm and Video Event Notification) monitoring system connects through wired or wireless Ethernet.

OPERATION: After the initial site preparation is completed, the systems can be installed and operating in less than an hour. When the system is powered up, it acquires an initial background count. The process normally takes twenty seconds. The background count is continually updated until the system is occupied.

When the detector senses occupancy, the system starts comparing the current count with the most recent background data. Alarm comparisons are made every 200ms. If the count exceeds the alarm level, both audible and visual alarms will be triggered. The system monitors itself and indicates low and high background conditions. System status is continuously updated on the SC-770 display.

Specifications

- SENSITIVITY:
  - Gamma: Will detect 3g ^{235}U (HEU) or 0.08g ^{239}Pu when tested in accordance with ASTM Standard C 1169 for Category III* monitors.
  - Neutron: Will detect 120g of 99% shielded ^{239}Pu based solely on neutron detection.
- DETECTORS:
  - Gamma: Two, 36″h x 10″w x 1.5″d (91 x 25 x 4cm) organic plastic scintillator detectors per pillar; provides approximately 2,160 in^3 (35.4 liters) of detector volume per system. The scintillator detectors are shielded on four sides with 0.375″ (10mm) of lead.
  - Neutron: Two, 2″ diameter x 36″ (5 x 91cm) ^{3}He tubes per pillar.
- ALARM LEVEL: SPRT for neutron, N*sigma for gamma, entered from the numeric keypad.
- ALARM INDICATION: Gamma alarms are indicated by a red strobe light mounted on the master pillar. High and low faults along with other fault conditions are indicated by an amber light. Neutron alarms are indicated by a blue strobe light. Audio alarms are triggered for gamma or neutron alarm conditions.
- DISPLAY: Alphanumeric LCD, 4 lines x 16 characters
- COMMUNICATIONS: Equipped with RS-232 and Ethernet communications capability.
- POWER REQUIREMENTS: 90 - 250 Vac, 47 - 63 Hz, less than 100 VA
- BATTERY LIFE: Greater than 12 hours normal operation
- DIMENSIONS:
  - PM-700AG: 84″h x 22″w x 8″d (213 x 56 x 20cm) per pillar
  - PM-700AGN: 84″h x 26″w x 8″d (213 x 66 x 20cm) per pillar
- WEIGHT:
  - PM-700AG: ≈400 lb (181kg) per pillar
  - PM-700AGN: ≈600 lb (272kg) per pillar
- ENVIRONMENTAL: 0˚ to 122˚F (-18˚ to 50˚C); designed for use in a sheltered area.
  - Optional severe environment: -30˚ to 122˚F (-34˚ to 50˚C)
- OPTIONAL COMPONENTS: AM-270, RAVEN monitoring system

*ASTM Standard C 1169 is available from The American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428, (610) 832-9585.

Applications

These monitors are designed to automatically scan pedestrian traffic without the need for frequent calibration. They are intended for applications where the relatively low energy emissions from ^{235}U and ^{239}Pu are the main concern. They are currently in use at uranium enrichment plants, weapons manufacturing plants, weapons storage sites, nuclear laboratories, nuclear waste disposal and storage sites where protection of SNM is essential.

Neutron monitoring adds the capability of detecting shielded neutron emitters.

Both models share TSA's unique design features of high sensitivity and reliable operation in variable background environments. These systems cover most pedestrian monitoring applications. TSA's expert engineering staff can adapt them to meet special requirements, if necessary.

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