arktis
RADIATION DETECTORS

Minimal impact on throughput

P1000: Pedestrian Portal Monitor

Reliable detection device with high throughput

The Arktis P1000 pedestrian RPM in a single-sided configuration is comprised of two PVT-based gamma detectors. The pedestrian monitor can be configured as a single-sided or double-sided system, in which the PVTs are then split over the two sides. A version integrating neutron detectors is also available.

Key features

- Highly sensitive
- Single- or double-sided walk-through portal monitor
- Automatic scanning, high throughput
- Clear alarm indication
- Networkable, remote access
- Adjustable alarm threshold
- Option to include neutron detectors (He-3 free)
- Supports cameras and occupancy sensor (optional)
- IP65 ingress-proof environmental package available; climate control for outdoor use available as well

P1000: Pedestrian RPM

Reliable detection device with high throughput

arktis
RADIATION DETECTORS

System Specifications	
System Description	Single-sided portal monitor with gamma detector; Overall portal size: 1800 x 600 x 400 mm^3. Depending on the installation, the pillar requires an additional structure for fixing on the ground.
Alarm Indication	Audible and visual alarm Each monitor is equipped with audible alarm annunciation and visual indication for radiation alarms. On-pillar alarm indicators promptly show gamma radiation intensity (1 green, 1 orange and 4 red segments). The alarm results are also reported remotely to the central alarm console. See details under *Operator Consoles and Interface Images* below.
Data Storage and Alarm Reports	Automatic screening with alarm display based on signal above threshold; Background updated automatically; can also be updated manually. Thresholds user-configurable (alarm level: N*Sigma). Entirely digital signal readout and analysis to maximize response speed. If occupancy sensors are present, detailed alarm reports are stored on the remote console, including time of the alarm, the gamma profile chart during the occupancy and other information related to occupancy. The alarm data is also available in ANSI 42.42 standard format.
Operator Consoles and Interface Images	Intuitive Graphical User Interface (GUI). Three possible Trigger modes: • Occupancy: start recording when an object enters the detection zone • Threshold: alarm and data record when the count rate exceeds a fixed threshold. • Manual: the user controls the beginning and the end of Scans. The scan status can either be "undefined", "background" or "gamma". The last triggers alarms. In case of an alarm, the whole area changes its color to indicate the alarm visually. The displayed count rates are averaged on a moving window with a default width of 5 seconds. Alarm data delivered to central alarm station.
Walk-through Speed	All performance tests done with a speed of 1.2 m/s
Power	220 VAC, 50-60 Hz, < 90 W
False Alarm Rate (FAR)	< 1/1000 (configurable)
Data Transmission	Transmission via Ethernet, Monitor IP addressable; equipped with interface to directly connect to remote computer.
Gamma Detectors	
Gamma Detector Specifications	Material: PVT; Dimensions: 200 x 50 x 1000 mm^3 (=10 l) Each PVT block is read out by a Photomultiplier tube, whose voltage divider base contains a multichannel analyzer powered by Ethernet. In order to improve its directional sensitivity, the sides of the gamma ray detector not viewing the detection zone are shielded with 10 mm of lead. Power consumption <5 W per detector, fed through PoE (Power over Ethernet)
Sensitivity	For a point source at 1.5 m distance from the monitor pillar surface midpoint at 0.1 m, 1 m and 2 m (above the ground), the following minimum absolute detection efficiency requirements are met per pillar: 1260 net cps/MBq for Co-57 (122, 136 keV); 1440 net cps/MBq for Cs-137 (662 keV); 2790 net cps/MBq for Co-60 (1173, 1333 keV);
Optional Neutron Detectors (needs larger box, box dimensions: 2000 x 1000 x 400 m^3)	
Neutron Detector Specifications	1-2 per side; He-4 based (natural helium), rugged SiPM-based readout; 230 x 170 x 1200 mm^3; Gamma rejection: 10^{-7} ; Gamma immunity up to 100 µSv/hr with 0.9 < GARRn* <1.1 Power consumption: 12 V, 3.0 W per detector. No high voltage required.
Optional Peripherals	
Occupancy Sensors and Cameras	Occupancy sensors enable automatic screening; The on-pillar occupancy sensors are based on range sensor technology and can be adjusted by the user to optimize its RPM occupancy field of view. The monitor automatically updates the background rate while no occupancy is detected. Optional cameras provide further information, in case of an alarm two pictures are typically stored in the report (user-configurable). All the adjustable features can be remotely controlled from the Graphic User Interface.

* Gamma Absolute Rejection Ratio for neutrons. See R. Kouzes et al, "Neutron detection gamma ray sensitivity criteria", http://dx.doi.org/10.1016/j.nima.2011.07.030.