

Previous model number: 5125

B5540 Series Vehicle Homeland Security Portal Monitors

Introduction

The ANTECH B5540 Series Vehicle Homeland Security Portal Monitors are designed to detect radioactive materials and plutonium contained in moving vehicles. They have both gamma-ray and neutron detection capability. The B5540 Series are suitable for road and rail applications and can be supplied in 2 metre high (Model B5542-440), 3 metre high (Model B5542-640), and 4 metre high (Model B5544-860) configurations.

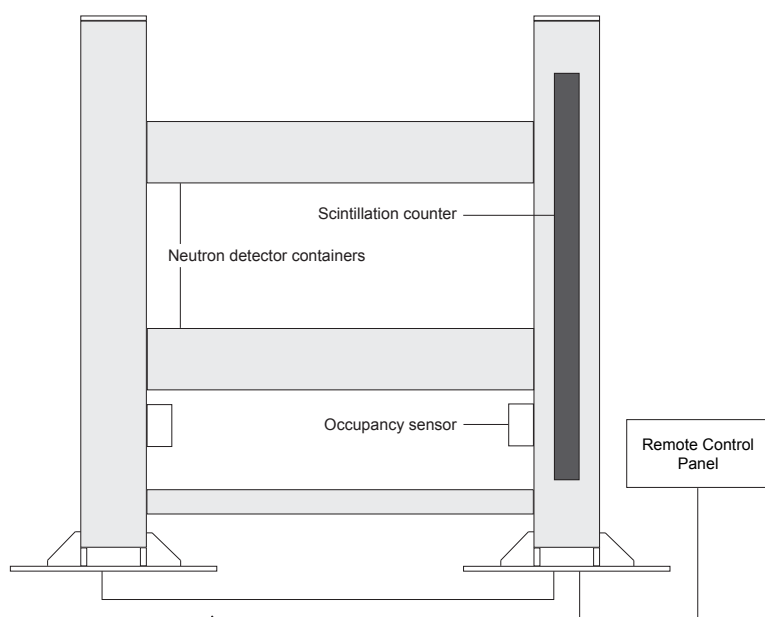
The technology behind the ANTECH B5540 Series is derived from work performed at the Los Alamos National Laboratory (LANL) in the United States and implemented in the late 1980s by Jomar Systems. Since the transfer of this technology to ANTECH, extensive improvements have been made and ANTECH portal monitoring technology represents the current state of the art for Homeland Security monitoring.

Gamma-ray measurements are performed by sensitive shielded and collimated plastic scintillator detectors that use low noise photomultiplier tubes. Neutron measurements are performed by polyethylene moderated, high pressure ^3He detectors that identify the presence of plutonium by passive neutron counting. The ^3He detectors are connected to high-speed charge collection electronics and operate in neutron totals counting mode. ANTECH is also able to offer lower cost ^{10}B based neutron detector technology.

The operation of the B5540 Series is automated through the use of an onboard microprocessor controller that performs system diagnostic testing, input monitoring and background discrimination. The controller employs algorithms based on the Sequential Probability Ratio Test (SPRT), developed originally by Fehla and others at LANL. The B5540 Series contain all the necessary electronics, including controller, power supplies, amplification, single channel analyser and high voltage bias supplies to constitute stand alone instruments.

Each model contains occupancy sensors and speed detection circuits. Each control cabinet contains a battery and charger suitable for a minimum of 12 hours off-line working. Controllers and warning alarm are continually active.

The B5540 Series is available in the standard configuration or can be re-configured for special applications. A typical installation consists of two assemblies, one positioned on either side of a carriage way. The B5540 Series is compliant with the requirements of ASTM C1112-93.



Model 5225-440



Model 5245-860

Features

- Gamma ray and neutron detection
- Micro-controller based automated operation with diagnostic functions
- RS-232/Ethernet interface for controller set up or remote monitoring
- User selectable alarm provided as visual, audio or electronic signal
- Plastic scintillators for gamma-ray detection and ^3He or ^{10}B based technology for neutron detection
- Archiving of detection and background statistics
- Operation in continuous pass through mode

Benefits

- Reliable operation with a low rate of false alarms
- Uses digital electronics with reduced electrical noise
- Two detection technologies combined in a single monitor
- Unattended automatic operation with optional operator remote display
- Suitable for operation in harsh environmental conditions
- Low rate of false alarms (typically less than 1 in 10000) even at the higher sensitivity. Sensitivity and the resulting false alarm rate can be set by the user.
- Can operate in extremes of temperature and humidity, so is suitable for use in harsh environmental conditions
- Inherently low maintenance due to lack of moving parts
- The RCP can be up to 100 metres (328.08 feet) away from the pillars without degrading performance

Specification

	B5542-440	B5543-640	B5544-860
Typical dimensions of assembly on each side of carriage way (H x W x D)	2200 mm x 2500 mm x 500 mm (86.14 in x 98.43 in x 19.69 in)	3200 mm x 2500 mm x 500 mm (125.98 in x 98.43 in x 19.69 in)	4200 mm x 2500 mm x 500 mm (165.35 in x 98.43 in x 19.69 in)
Gamma detectors	2 in one pillar of each assembly	3 in one pillar of each assembly	4 in one pillar of each assembly
Neutron detectors	2 in each assembly, each containing 2 ^3He tubes	2 in each assembly, each containing 2 ^3He tubes	3 in each assembly, each containing 2 ^3He tubes
Detection levels	8-10 g total Pu (military grade), approx. 1 kg highly enriched U	8-10 g total Pu (military grade), approx. 1 kg highly enriched U	8-10 g total Pu (military grade), approx. 1 kg highly enriched U
Approx. separation between assemblies	4500 mm (177.16 in)		
Vehicle transit measurement accuracy	0-30 km/h within 10%		
Battery back-up	At least 12 hours full functionality (including alarms)		
Alarms	Preset values for neutron and gamma counts (user adjustable)		