

The covert movement of dangerous, radioactive materials is a great security threat. Radionuclide detection and identification systems are required to effectively monitor this threat. The Thermo Scientific Stride detection units and systems are designed not only to detect, but to also classify such materials.

Thermo Scientific Stride

Radionuclide Detection and Identification Systems



Features

- Rapid detection of presence of radioactivity or radioactive material
- Advanced isotope identification
- Categorizes radiation as Innocent, Suspicious or Threat
- Alarms on doserate changes above background
- Continually stabilizes for temperature and background conditions changes
- Wired or wireless communication to LAN
- Server and client software packages available
- Visible and audible alarm annunciators
- Permanent event record storage
- Remote alerts to PCs, PDAs and the like
- Open or covert installations

Detecting the Covert Movement of Radioactive Materials

Stride™ systems can be openly or covertly installed in any high traffic area as a portal, as well as a long-parcel or freight conveyor systems. Within just a few seconds, a Stride detection unit will classify the type of material detected (medical, industrial, naturally occurring or special nuclear material). In addition, the system will also categorize it as innocent, suspicious or threatening and relate the specific isotope detected.

Depending on the amount of radioactive material present, the pace of the transporter, and the detection unit chosen, radionuclides can be detected and properly identified in a few seconds. Classification of the type of material and threat identification is also provided. In addition, the specific isotope is identified and security personnel are alerted via visible or audible annunciators.

Detection units are available in a wide variety of sizes and features for nearly any application. Detection units have several things in common. A typical Detection Unit consists of a NaI scintillation detector for gamma radiation detection; DSP (Digital Signal Processing) based electronics with source or LED stabilization; a multichannel pulse height analyzer; a K⁴⁰ source in the form of KCl for calibration verification and at times, stabilization; a usage appropriate enclosure; mains, battery or PoE (Power over Ethernet) power; and a data and control communication method. An optional He³ neutron detector and high doserate GM detector are available. Wireless communication with rechargeable battery power is also available for Series 300 Stanchion Detection Units.



Thermo Scientific Stride Series 200

Basic detection units are housed in a dust and moisture proof aluminum enclosure, with a 2-in diameter by 3-in NaI detector, RJ-45 Ethernet communication and PoE (Power over Ethernet). An optional He³ neutron detector and high dose rate GM detector are available.



Thermo Scientific Stride Series 300

Stanchion detection units are housed in a security stanchion with a 2-in diameter by 3-in NaI detector, RJ-45 Ethernet communication and PoE (Power over Ethernet). An optional He³ neutron detector and high dose rate GM detector are available. Wireless communication with rechargeable battery power is also available.



Thermo Scientific Stride Series 400

Ruggedized detection units are housed in a watertight stainless steel enclosure that is deployable down to depths of 165 feet with a 2-in diameter by 2-in NaI detector, RS-232C communication with rechargeable batteries for power.



Thermo Scientific Stride Series 700

Security detection units are housed in an aluminum pedestal with wood top and base with a large 2-in thick by 4-in wide by 16-in long NaI detector, DSP electronics, uninterruptable power supply (UPS) with an RJ-45 Ethernet communication. An optional He³ neutron detector and high dose rate GM detector are available.



Thermo Scientific Stride Series 800

Portal detection units are enclosed in an aluminum housing with a wood top and base with two large 2-in thick by 4-in wide by 16-in long NaI detectors, DSP electronics, uninterruptable power supply (UPS) with an RJ-45 Ethernet communication. An optional He³ neutron detector and high dose rate GM detector are available.

Minimum Activities (μCi) for Nuclide Identification

time*	^{133}Ba	^{57}Co	^{60}Co	^{137}Cs	^{67}Ga	^{131}I	^{192}Ir	$^{99\text{m}}\text{Tc}$	^{201}Tl	^{226}Ra
1 sec	12.8	26.3	4.8	2.9	16.1	3.8	2.7	12.8	60.2	13.3
5 sec	6.4	14.3	1.0	1.7	8.1	1.9	1.5	6.6	30.1	2.9
10 sec	4.0	9.6	0.6	1.2	5.4	1.1	1.1	4.9	21.1	1.6
30 sec	1.6	3.2	0.2	0.5	2.7	0.6	0.5	1.8	9.0	0.6
60 sec	1.1	2.0	0.2	0.3	1.6	0.4	0.4	1.1	6.5	0.4

distance†	^{133}Ba	^{57}Co	^{60}Co	^{137}Cs	^{67}Ga	^{131}I	^{192}Ir	$^{99\text{m}}\text{Tc}$	^{201}Tl	^{226}Ra
0.5 m	17.3	51.8	5.2	4.7	23.3	10.3	4.1	22.1	97.9	15.6
1.0 m	51.9	129.6	10.5	14.2	67.0	20.5	12.3	58.1	261.2	31.3
1.5 m	103.7	233.2	15.7	28.4	131.1	30.8	24.6	108.0	489.7	46.9

*Listed are the minimum source activities for the various nuclides at a distance of 0.5 m (20 in) from the detector.

For distances of 1 m, 2 m, 3 m and 4 m, multiply the activity values by 4, 16, 36 and 64 respectively.

†Detectable activity of unshielded source moving at a rate of 1.2 m/second

Performance data: count rate (cps) for 1 mCi sources* on 2-inch diameter by 3-inch long NaI detector

	^{133}Ba	^{57}Co	^{60}Co	^{137}Cs	^{67}Ga	^{131}I	^{192}Ir	$^{99\text{m}}\text{Tc}$	^{201}Tl	^{226}Ra
0.5 m	63000	42000	72000	34000	37000	53000	95000	39000	3300	90000
1.0 m	16000	10000	18000	8600	9200	13000	23000	9700	8200	22000
2.0 m	3900	2600	4500	2100	2300	3300	5700	2400	2100	5600
3.0 m	1700	1100	2000	950	1000	1500	2600	1100	910	2500
4.0 m	970	640	1100	540	570	820	1400	600	510	1400

*Each source (37,000,000 dps = 1 mCi) is positioned perpendicular to the detector axis at a height equal to the center of the detector.

Thermo Scientific Stride Radionuclide Detection and Identification Systems

General Specifications

Gamma Detector Dimensions	Series 200: 50.8-mm (2-in) diameter by 76.2 mm (3 in) or 101.6 mm (4 in) long NaI Series 300: 50.8-mm (2-in) diameter by 76.2 mm (3 in) or 101.6 mm (4 in) long NaI Series 400: 50.8-mm (2-in) diameter by 50.8 mm (2 in) long NaI Series 700: 50.8 mm (2 in) thick by 101.6 mm (4 in) wide by 406.4 mm (16 in) long NaI Series 800: 50.8 mm (2 in) thick by 101.6 mm (4 in) wide by 406.4 mm (16 in) long NaI
Gamma Energy Range	20 keV to 3 MeV
Neutron Detector	He ³ gas filled ionization detector with moderator for thermal neutrons
Neutron Energy	0.025 eV to 15 MeV
High Doserate Detection	Optional sealed GM detector
Operating Temperature	-15°C to +50°C (+5°F to +122°F)
Storage Temperature	-40°C to +95°C (-40°F to +203°F)
Operating Humidity	10% to 80%, non-condensing
Data Throughput	>100k cps
Data Input Rate	≤300k cps
Spectrum	1024 channels; 24 Bits per channel
Spectral Fidelity	Spectra are highly linearized and calibrated to enable linear summing at the server
Doserate Range	0 $\mu\text{Sv/h}$ to 100 $\mu\text{Sv/h}$
Doserate Resolution	10 nSv/h
Doserate Energy	50 keV to 1.5 MeV
Stabilization	Peak stabilized on K40 gamma line or LED peak

Specifications are provided on the data sheets corresponding to the specific model numbers.

About Thermo Fisher Scientific

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