



## INVIVO COUNTING

# ACCUSCAN™

*Horizontal Bed Whole Body Counter*

The ACCUSCAN bed system is an excellent choice for hospitals and research facilities.



## FEATURES

- Turnkey, whole body counting system
- Identifies and quantifies radionuclides inside the body in minutes
- Locates contamination anywhere on the body, including hands and feet
- Provides simultaneous energy and positional spectra for accurate interpretation of data
- Uses a linear geometry for optimal accuracy
- Complies with ANSI N13.30
- Complies with CE requirements

## DESCRIPTION

The ACCUSCAN bed is a complete, turnkey, whole body counting system. This system identifies and quantifies radioactivity inside the human body with a simple five- to eight-minute count. The package includes a computer, a shadow shield with a computer controlled scanning mechanism, computer controlled signal processing electronics, detector(s), the Mirion Apex-InVivo™ counting software, factory integration and calibration, as well as installation and on-site training. Once the system is installed, it's ready to use.

Simply position the subject horizontally on the bed and start a count. The system automatically moves to the starting position, moves the person through the detector tower for the scan and returns to the home position to allow an easy exit. During this time the Apex-InVivo software collects and displays energy and multichannel scaling spectra. The energy spectra are used to identify which nuclides are present and the multichannel scaling spectra show us where the contamination is located.

## FEATURES

Includes:

- Apex-InVivo software for flexibility, ease of operation and extensive QA data collection options
- A horizontal bed for subject comfort
- Computer controlled scanning bed and signal processing electronics for push button operation
- 10 cm low background shadow shield for performance and economy

A choice of detectors:

- Sodium iodide for short count times, or
- Germanium for complex spectra

## DESCRIPTION

At the completion of the scan, the system automatically stores the spectral data and personnel demographics, analyzes the spectra and prints a report. The operator can elect to have the analysis report sent to the display, the printer or both. The analysis results are also stored in the system's database for future reviews and investigation.

The Mirion ISO9001 quality program and calibration process ensure that your system provides accurate, defensible results. Each system is calibrated with an NIST-traceable source and the Mirion Model 2257A Transfer Phantom to meet the requirements of **ANSI N13.30, Performance Criteria for Radiobioassay**.

The ACCUSCAN bed system is an excellent choice for hospitals and research facilities. In these settings it may be desirable for the subject or patient to be counted in a reclining rather than a standing position, due to the condition of the patient or the length of the count. The 2 m (6.5 ft) scanning range of the ACCUSCAN bed is "larger" than the expected "location" of activity within the body. This increases the system's accuracy over a range of subject sizes by minimizing any variance in activity results due to the size or location of any radioactivity detected during a scanning count.

The Mirion ACCUSCAN bed is designed to provide the accuracy and flexibility typical of large expensive shielded room systems at a much lower price. The design is based on the Palmer and Roesch research done at the Hanford Laboratories. Palmer and Roesch documented that a properly designed shadow shield has a background equivalent to a fully enclosed shield, for energies greater than 250 keV.

The ACCUSCAN bed design provides a full 10 cm (4 in.) of low background steel shielding in all straight line directions from the detector. This shadow shield is designed to allow the system to be used even in areas of elevated background. The special low-background steel is fabricated with a cobalt free process that eliminates the  $^{60}\text{Co}$  contaminants normally found in steel.

The ACCUSCAN bed system can be configured with up to three large sodium iodide (NaI) detectors, or two sodium iodide and two germanium detectors. The system's performance will depend upon the detector sizes and types selected. Table 1 lists typical MDA performance values for the standard configurations.

## SPECIFICATIONS

- Shield**
- Total weight: 5450 kg (12 000 lb)
  - Heaviest item weight: 450 kg (1000 lb)
  - Floor space required: 4.6 x 1.2 m (15 x 4 ft)
  - Height: 0.9 m (3 ft) for NaI; 1.5 m (5 ft) for Ge
- Electronic console (optional)**
- Single pedestal desk: 76 x 152 cm (30 x 60 in.)
  - Cable separation from shield: 9 m (30 ft)
- Power**
- Specify: 110 or 220 V ac, 50 or 60 Hz
  - Requirements: Vary depending upon computer and electronics
- Environmental**
- Operating temperature range: 0-40 °C (32-104 °F). Stable to within ±1 °C for NaI; ±5 °C for Ge
  - Humidity: Up to 80% non-condensing
  - Meets the environmental conditions specified by EN 61010, Installation Category I, Pollution Degree 2
  - Background radiation: Normal background assumed
  - General: Clean, dust free area
- Note: Please refer to the Mirion website for additional details on:
- In Vivo Counter Selection
  - Apex-InVivo Software
  - Model 2257A Transfer Phantom

Table 1.  
Typical MDA performance for an eight minute scanning count for standard ACCUSCAN bed configurations.

Nuclide	Source Distribution	ACCUSCAN Bed with one 5 x 3 x 16 in. NaI Detector. In Bq (nCi)	ACCUSCAN Bed with two 5 x 3 x 16 in. NaI Detectors. In Bq (nCi)	ACCUSCAN Bed with one GC2520 – 25% Relative Efficiency Germanium Coax Detectors. In Bq (nCi)	ACCUSCAN Bed with two GC2520 – 25% Relative Efficiency Germanium Coax Detectors. In Bq (nCi)
<sup>134</sup> Cs	Whole Body	174 (4.7)	123 (3.3)	419 (11.3)	296 (8.0)
<sup>137</sup> Cs	Whole Body	204 (5.5)	144 (3.9)	492 (13.3)	348 (9.4)
<sup>54</sup> Mn	Lung	130 (3.5)	92 (2.5)	340 (9.2)	241 (6.5)
<sup>58</sup> Co	Lung	130 (3.5)	92 (2.5)	314 (8.5)	222 (6.0)
<sup>60</sup> Co	Lung	141 (3.8)	100 (2.7)	314 (8.5)	222 (6.0)
<sup>144</sup> Ce-Pr	Lung	2368 (64)	1674 (45)	5704 (154)	4033 (109)
<sup>131</sup> I	Thyroid	104 (2.8)	74 (2.0)	194 (5.2)	137 (3.7)
<sup>133</sup> I	Thyroid	96 (2.6)	68 (1.8)	178 (4.8)	126 (3.4)
<sup>58</sup> Co	Gastrointestinal Tract	185 (5.5)	131 (3.5)	277 (7.5)	196 (5.3)
<sup>60</sup> Co	Gastrointestinal Tract	185 (5.5)	131 (3.5)	235 (6.4)	167 (4.5)

Note: The quoted values are based on the Curie MDA formula and are for an unexposed subject in average conditions at the factory. For the purposes of this table, MDA activity is defined as  $2.71 + 4.66 S_{BKG}$  divided by the system efficiency based on the energy. The background region is defined for 95% statistics in accordance with ANSI N-13.30 and ISO/DIS 11929-1 method. Site performance may vary due to statistics, environmental conditions, MDA definition, etc.

