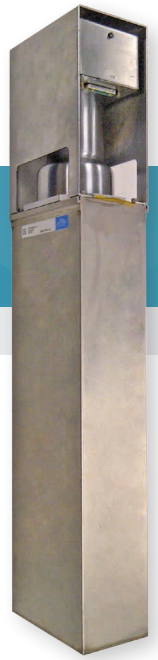
MIRION TECHNOLOGIES

NAIS-3x5x16™

NaI(Tl) LED Temperature-Stabilized* Scintillation Detector



KEY FEATURES

- Patented LED temperature stabilization*
- Stable to within ±2% (typical) over the temperature range of -20 °C to 50 °C.
- Compatible with Mirion Osprey® digital tube-base MCA and Lynx® MCA
- Compatible with DSP-based Mirion InVivo Counters (FASTSCAN™, ACCUSCAN™ Bed, Scanning WBC/ Actinide Lung Counters)
- All-metal housing with a magnetic/ light shield

DESCRIPTION

Model NAIS-3x5x16 Sodium Iodide Scintillation Detector is a high-efficiency scintillation detector featuring a 3x5x16 in. NaI(Tl) crystal in a stainless steel housing, including a photomultiplier tube, an internal magnetic/light shield, a high-voltage power supply (HVPS), stabilization electronics, and preamplifier. NaI(Tl) detectors have a proven record of long term reliability but have peak-shifting issues in changing temperatures.

The NAIS-3x5x16 NaI(Tl) detector is LED temperature-stabilized*, eliminating these peak-shift problems caused by fluctuations in ambient temperature. This makes the NAIS-3x5x16 detector suitable for use in non-air-conditioned rooms as well as in field applications. The in-built LED temperature stabilization continuously monitors and adjusts the gain of the detector automatically to ensure consistent performance throughout the entire temperature range. This allows users to perform nuclide identification under all conditions and environments (both indoor and outdoor), while maintaining the highest confidence in the results obtained by the instrument.

The housing is of stainless steel construction. The NAIS-3x5x16 gain stabilizer is optimized for digital signal processor shaping of 1 µs rise time and 1 µs flat top, which is the default setting of the Osprey digital tube base MCA.

*US Patent 7,005,646 B1 and 7,049,598 B1

SPECIFICATIONS

TEMPERATURE STABILIZATION

Stable to within ±2% over the temperature range of -20 to +50 °C (-4 to 122 °F).

Figure 1 compares the measured CS-137 peak centroid measured by a standard 3x5x16" detector with the NAIS-3x5x16 detector over a temperature range of 20-22 °C.

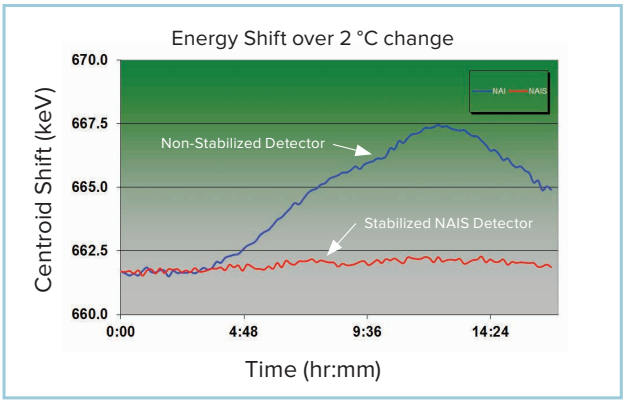


Figure 1 – Centroid variation for temperature range 20-22 °C

Figure 2 is a similar comparison over a broader temperature range (10-30 °C) showing more severe centroid shift for the standard detector compared with excellent stability for the NAIS-3x5x16 detector.

INPUTS/OUTPUTS

A single 13W3 combination D-Sub connector hosts coaxial and unshielded connections as follows:

- Pin 1 – +12 V power input at 70 mA.
- Pin 6 – signal ground.
- Pin 7 – Rx.
- Pin 8 – Tx.
- Pin 9 – +5 V out (not for user connection).
- Pin 10 – +5 V in at 70 mA.
- Coaxial Connection A1 – GATE signal.
- Coaxial Connection A2 – Fast ENERGY output, positive unipolar pulse nominally follows scintillator light pulse.
- Coaxial Connection A3 – Slow ENERGY output, positive unipolar tail pulse, nominal 50 µs fall time.

COMPATIBLE SHAPING

- Gain stability is optimized over temperature for digital signal processor shapers set to 1 µs rise time and 1 µs flat top. This is the default setting of the Osprey digital tube base MCA.

INDICATOR

- Blue LED.
  - – Blinks when stabilizing.
  - – On solid once stabilized.

PERFORMANCE

- RESOLUTION – 8% at 662 keV (^{137}Cs).
- TYPICAL OPERATING VOLTAGE – Internal setting.
- Stable to within ±2% (typical) over the temperature range of -20 °C to 50 °C.

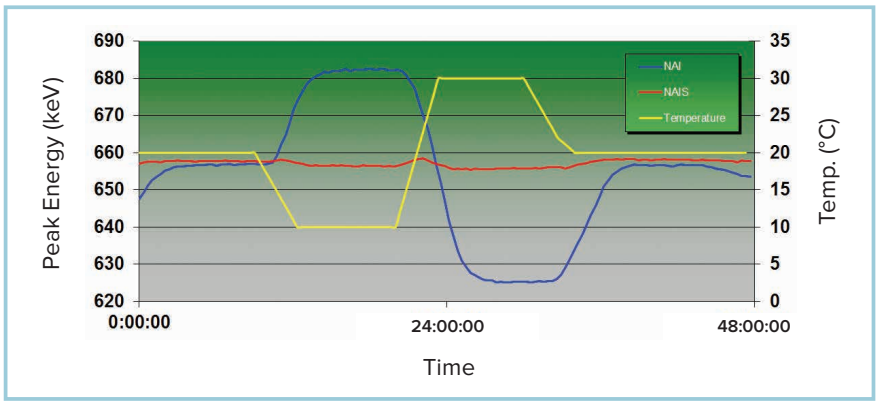


Figure 2 – Centroid variation for temperature range 10-30 °C

NAIS-3x5x16 NaI(Tl) LED Temperature-Stabilized* Scintillation Detector

PHYSICAL

- SIZE – See outline drawing.
- WEIGHT – 17.1 kg (37.8 lb).

ENVIRONMENTAL

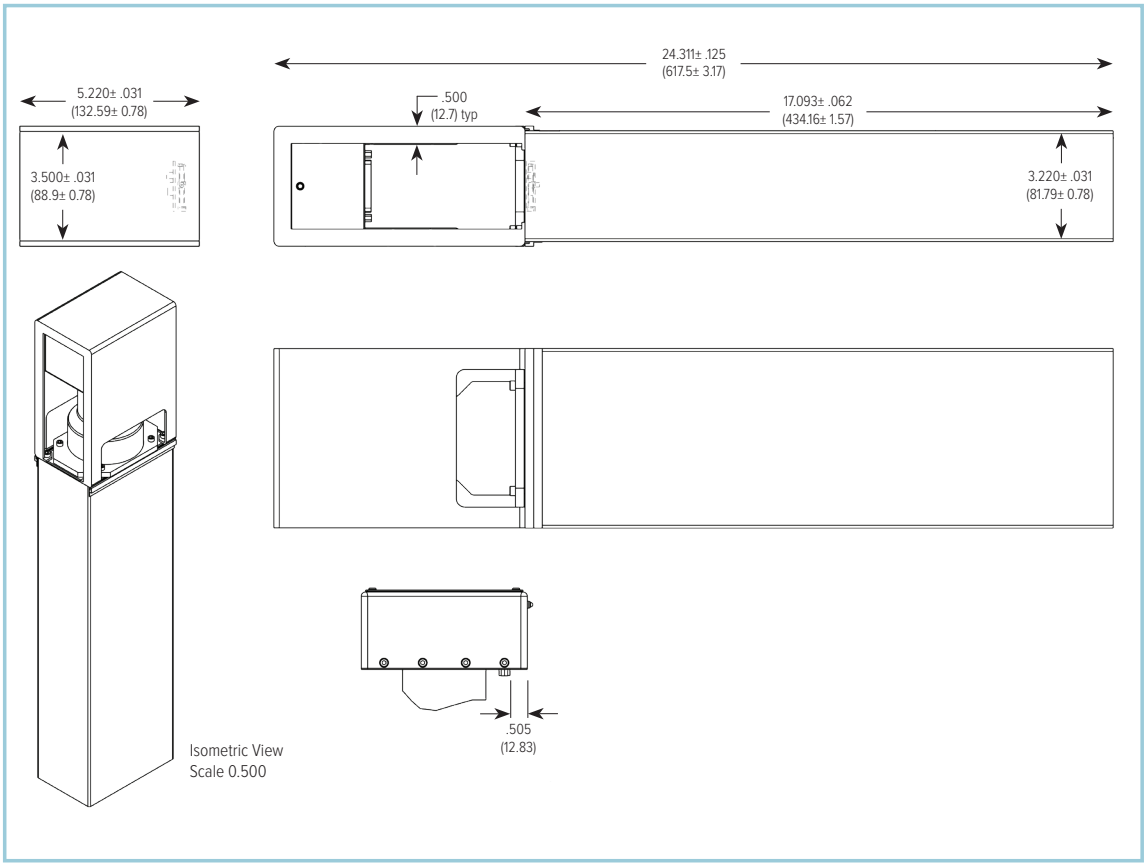
- OPERATING TEMPERATURE – -20 to +50 °C (-4 to 122 °F).
- OPERATING HUMIDITY – 85% non-condensing. Meets the environmental conditions specified by EN 61010, Installation Category I, Pollution Degree 2.

ORDERING INFORMATION

- NAIS-3x5x16 NAI(Tl) Temperature-Stabilized Scintillation Detector.

OPTIONS

- ADAPT-OSPNAIS – Osprey-MCA to NAIS-3x5x16 adapter. Must also have CABLE-OSPNAIS.
- CABLE-OSPNAIS – 6' Cable to connect Osprey-MCA to NAIS-3x5x16 LED Temperature-Stabilized NaI Detector. Must also have ADAPT-OSPNAIS.
- CABLE-MCANAIS – 6' Cable to connect a Lynx MCA to a NAIS-3x5x16 LED Temperature-Stabilized NaI Detector.



Dimensions in the Outline Drawing are in inches [mm] and are subject to change at the discretion of Mirion.

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