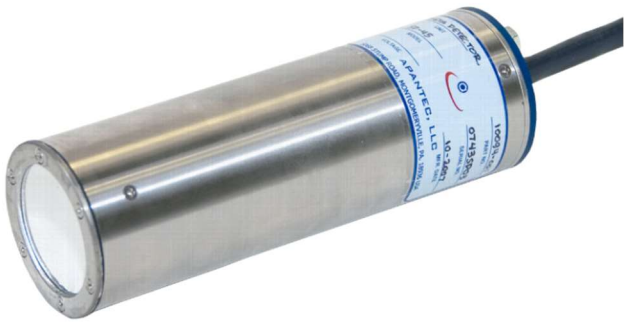
SD Series Scintillation Detectors/Analyzer

Gamma & Beta Measurement | Rapid Deployment



SD Beta Detector with Aluminized BoPET film window

The Apantec LLC SD Series detectors are scintillation based radiological detectors used to measure alpha, gamma, and/or beta radiation in process and environmental radiation monitoring systems. SD Series detectors include a scintillator, photomultiplier tube, mu-metal shield, and dynode chain in a cylindrical enclosure. A light emitting diode (LED) located within the enclosure provides test pulses to verify detector functionality. A temperature sensor within the detector can be used for temperature compensation. The scintillator is selected based on process conditions and required sensitivity.

Features

- "Smart" probe permits rapid deployment.
- Detector accuracy ±10% for Cs-137,
  Energy response ±15%.
- Mu-metal shield for protection against stray magnetic fields.
- Sealed cylindrical enclosure.
- Mylar window for beta measurement (Optional).
- High temperature versions available (Optional).
- Temperature compensation (Optional).

A separate single-channel analyzer (SCA) model SDA3E is used for pulse height analysis and biasing voltages. The SDA3E is located near the detector and performs several functions. A closed-loop feedback control circuit in the SCA sets the detector parameters such as high voltage, allows for remote calibration and functional testing of the detector, and can be used to correct variations in gain due to temperature, aging, and power supply drift.

The SDA3E can be set to integrate up to three specific regions of interest (ROI) simultaneously when used for gamma applications, or set to operate in gross counting mode. Software algorithms are included to provide user with adjustable filter time to integrate the count rate data from each ROI. The spectrum/analyzer enclosure is provided with a NEMA4 rating and is designed for mounting to a flat surface. The detector is interconnected to the SDA/analyzer enclosure using either an integrated (pigtail) or separate cable.

SDA3E Single-channel analyzer (SCA)

Serial communication is used to interconnect the SDA3E with a remote radiological display and control unit (Apantec Model RM1 Series). The interconnection cables are provided fully assembled and tested. All SD Series detectors are provided fully calibrated to NIST standards.

SD Gamma Detector with MS Style Connector

Benefits

- No Radioactive Source Required.
- Thermistor for Automatic Temperature Compensation.
- Light Emitting Diode (LED).
- Solid State Check Source.
- Overcomes Crystal Discoloration.
- Extended Calibration Interval
- Automatic Gain Control (Optional)

Contact Apantec LLC for more information on the advantages of the SD Series Detector and SDA3E SCA.

SD Gamma Detector with Pigtail

Configuration

SD Series Detectors are highly configurable and utilize different scintillators depending on the application. See below Table for some examples.

Model	Crystal	Size	Rad.	Temp.
SD201A	ZnS	2" x 0.1"	Alpha	-10 to 50 °C
SD115N	NaI	1" x 1.5"	Gamma	-10 to 50 °C
SD115NH	NaI	1" x 1.5"	Gamma	-10 to 90 °C
SD220N	NaI	2" x 2"	Gamma	-10 to 50 °C
SD220NH	NaI	2" x 2"	Gamma	-10 to 150 °C
SD201P	NE102 plastic	2" x 0.01"	Beta	-10 to 50 °C
SD201PB	NE102 plastic/ BGO	2" x 0.01"/ ¼" cube	Beta	-10 to 50 °C

Note: Other crystal sizes, crystal combinations, temperature ratings and extended range detectors are available. Please consult Apantec LLC.

SD Beta Detector with Pigtail cable connected to SDA3E SCA

Specifications

SD SERIES SPECIFICATIONS

Dynamic Range:	1 to 10^7 CPM
Detector Accuracy:	±10% of true field intensity
Detector Linearity:	±5%
Operating Voltage:	500 to 1500 V
LED Background:	10 to 15 CPM
Operating Humidity:	0 to 95% non-condensing
Housing:	Stainless Steel or Aluminum, Sealed Cylinder
Weight:	5 lb nominal
Dimensions:	2.5 in ⌀ x 12.5 in length

SDA3E SERIES SPECIFICATIONS

Power Requirements

Power requirements:	max. 250 mA, ±15 VDC

SCA parameters

Energy Range:	100 keV to 4.00 MeV variable In steps of 10 keV
Energy Sensitivity:	100 mV to 4.00 V approx. corresponding to energy
Mode:	Integral or Differential
Window Width:	± 1% to ±90% around center energy.
Output Signal:	Positive pulses, 0.5 usec wide Capable of driving 500 ft
Energy Nonlinearity:	±1% of full scale Window Width
Accuracy:	±0.5% of energy setting LED Test Signal

LED Test Signal

Equivalent Energy:	6 MeV
Background Rate:	10 to 15 CPM Environmental

Environmental

Environmental Temp.:	0 to 50 °C
Dimensions:	6.25 in W x 7.5 in H x 5.03 in ⌀
Weight:	2 lb nominal