



MDN55EV2PA/MDNR55EV2PA Extended Range Gamma Scintillation Detector/Preamplifier Set



FEATURES

- Automatic gain stabilization using built in LED
- Operates in pulse mode and extended range current mode
- Linear over 9 decades
- Calibration cycles of up to two years
- Detectors are packaged in a water resistant O-ring sealed cylinder with a mu-metal shield
- Includes calibrated and matched pair PA300E preamplifier with three single channel analyzer channels

The MDN55EV2PA/MDNR55EV2PA matched pairs consist of a gamma scintillation detector coupled to a PA300E preamplifier. While the MDN55EV2PA variety utilizes a straight cable connection at the back of the detector, the MDNR55EV2PA utilizes a right angle connection for use in tight spaces. These factory matched and calibrated detector pairs simplify deployment in new or existing systems by eliminating the need for calibration/matching during installation. See ordering information for details.

The MDN55EV2/MDNR55EV2 high sensitivity extended range gamma scintillation detector consists of one NaI(Tl) gamma scintillator optically coupled to a photomultiplier (PM) tube via a Lucite light pipe. A reference Light Emitting Diode (LED) and a temperature sensor are embedded in the Lucite pipe.

This detector operates with a unique gain stabilization circuitry for temperature-compensated drift-free operation, resulting in improved accuracy and extended calibration cycles.

This MDN55EV2 operates in conjunction with a preamplifier, Model PA300E. The preamplifier contains circuitry that compares the LED pulses with a reference to provide closed loop feedback for automatic gain compensation. The PA300E also amplifies and shapes the detector output signal in order to provide digital pulses to the remotely located ratemeter. Procurement of matched and calibrated detector/preamplifier set is recommended to simplify maintenance and system support.

Together with its preamplifier, the MDN55EV2/MDNR55EV2 can be connected to multifunction control and display units such as iR7040, ADM606 and ADM616.

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DETECTOR

- Detector Type and Size – NaI: 38.1 x 25.4 mm (1.5 x 1 in.) (dia. x L)
- Nominal Detector Sensitivities –
 - In CANBERRA Iodine Sampler MAP35: 2.65 cpm/Bq (9.82 x 10⁴ cpm/μCi) for ¹³¹I
 - In CANBERRA Reference Geometry RG-1: 4.30 cpm/Bq (1.6 x 10⁵ cpm/μCi) for ¹³⁷Cs 1 in. dia. disc source; 8.10 cpm/Bq (3.0 x 10⁵ cpm/μCi) for ⁶⁰Co 1 in. dia. disc source; 7.84 cpm/Bq (2.9 x 10⁵ cpm/μCi) for ¹³³Ba 1 in. dia. disc source
- Detector Effective Range –
 - Pulse mode: 1 x 10¹ to 5 x 10⁶ cpm
 - Current mode: 2.5 x 10⁶ to 1 x 10¹⁰ cpm
- Energy Range: 50 keV to 2.55 MeV
- Natural Background (100 nGy/hr) in 2-inch Lead Shield: 110 cpm Typical above 70 keV
- Photomultiplier Tube: Electron Tubes 9266B
- Detector Window Assembly: Thin Stainless Steel
- Detector Output: Negative Pulse; 62 μV/keV
- Accuracy under Reference conditions: ≤±10%
- Linearity under Reference conditions –
 - ≤±10% over pulse mode range
 - ≤±15% over current mode range
- Detector Cable Assembly: Integral pigtail cable
- Typical Application –
 - Iodine Monitor
 - In-line liquid monitor

PHYSICAL

- Housing: Sealed Stainless Steel
- Size: 63.5 x 214 mm (2.5 x 8.43 in.) (dia. x L) straight; 63.5 x 226 mm (2.5 x 8.9 in.) (dia. x L) right angle
- Weight: 1.53 kg (3.36 lb) straight; 1.69 kg (3.72 lb) right angle

ENVIRONMENTAL

- Operating HV: -400 to -800 V Typical
- Nominal LED Background: 10 to 15 cpm
- Operating Temperature Range: -10 °C to +60 °C (+14 °F to +140 °F)
- Operating Humidity: 0 to 98% non-condensing

SPECIFICATIONS FOR PA300E

- Input Impedance: 9.1 K
- Voltage Gain: 16
- Energy Sensitivity: 1 mV per keV
- MCA Output: Positive or negative, adjustable amplitude
- Digital Output: Differential
- Operating Temperature Range: -10 °C to +55 °C (+14 °F to +131 °F)
- Energy Range: 50 keV to 2.55 MeV
- Housing: Stainless steel box
- Size: 152.4 x 152.4 x 101.6 mm (6 x 6 x 4 in.) (L x W x H)
- Weight: 2 kg (4.4 lb)
- Power: ±15 V dc
- Placement from Detector: Up to 1.8 m (6 ft)
- Placement to Ratemeter: Up to 305 m (1000 ft)

ORDERING INFORMATION

- MDN55EV2 – 1.5 x 1 NaI(Tl) Extended Range Scintillation detector, straight connector
- MDNR55EV2 – 1.5 x 1 NaI(Tl) Extended Range Scintillation detector, right angle connector
- MDN55EV2PA – 1.5 x 1 NaI(Tl) Extended Range Scintillation detector with straight connector, matched and calibrated with PA300E Preamplifier
- MDNR55EV2PA – 1.5 x 1 NaI(Tl) Extended Range Scintillation detector with right angle connector, matched and calibrated with PA300E Preamplifier
- PA300E – Assembly Preamplifier (Needs match-pair calibration)



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